VITALITY INDICIA, DEVICE, AND SYSTEM FOR CALCULATING VITALITY INDICIA, DETECTING AN ENVIRONMENTAL HAZARD, VISION ASSISTANCE AND DETECTING DISEASE

Abstract: A mobile computing device (100) for calculating vitality indicia (305), the mobile computing device (100) comprising a processor (1000) for processing digital data a memory device for storing digital data including computer program code and being coupled to the processor (1000) an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor (1000), one or more sensors for capturing environment input data and being coupled to the processor (1000), wherein the processor (1000) is controlled by the computer program code to receive, from the one or more sensors, the environment input data, calculate the vitality indicia (305) in accordance with the environment input data and display, using the augmented reality display device, the vitality indicia (305).
A MOBILE COMPUTING DEVICE, APPLICATION SERVER* COMPUTER READABLE STORAGE MEDIUM AND SYSTEM FOR CALCULATING A VITALITY INDICIA, DETECTING AN ENVIRONMENTAL HAZARD, VISION ASSISTANCE AND DETECTING DISEASE

5 Related Art
This document claims priority from Australian provisional patent applications nos. 2012903142 filed on 24 July 2012, 2012903217 filed on 27 July 2012, 2012903411 filed on 9 August 2012, 2012904530 filed on 17 October 2012, 2012904975 filed on 15 November 2012, 2012995969 filed on 22 November 2912 and 2013909886 filed on 14 March 2013 and all disclosures of these documents are incorporated within this document.

Field of the Invention
[1] The present invention relates to treatment of treatment and detection of unhealthy lifestyle, illness, disease process and the like and in particular to a mobile computing device, application server, computer readable storage medium and system for calculating a vitality indicia, detecting an environmental hazard, vision assistance and detecting disease

[2] The Invention has been developed primarily for use with mobile computing devices such as mobile computing devices including mobile phones, tablets, computers and the like, and augmented reality aids such as glasses or goggles having virtual reality overlay and will be described hereinafter with reference to this application. However, it will be appreciated that the Invention is not limited to this particular field of use.

Background
[3] The diagnosis of an unhealthy lifestyle, Illness, disease processes and the like require an examination by a trained practitioner such as a doctor or nurse. As such, where a person experiencing flulike symptoms, the person would visit the doctor for the purposes of diagnosis.

[4] However, in practice certain symptoms are often overlooked, therefore resulting in misdiagnosis, late diagnosis or no diagnosis at all.

[5] As such, in order to attain expedient diagnosis for the efficient treatment of Illness or disease, they need therefore exists for the monitoring of one or more
vitality Indica of a person such that remedial action may be taken when the vitality Indica indicates the onset of illness or disease.

Furthermore, certain lifestyle factors may eventually result in illness or disease. Such factors may comprise lack of exercise, lack of sleep, and inadequate nutritional Intake. In order for a person to maintain the correct balance of exercise, sleep and nutritional Intake, a person often enlists the services of a trained professional, such as a dietician, personal trainer and the like.

Hold, such trained professionals are beyond the reach of most people and therefore in need therefore exists for a system of monitoring a person's lifestyle such that remedial action may be taken where there is deficiency.

Many people suffer from various anxiety disorders today. Such anxiety disorders may comprise obsessive-compulsive disorders which may be characterised by sessions and compulsions. Sufferers of such anxiety disorders may exhibit certain characteristics, such as intrusive thoughts, and easiness, fear, and repetitive behaviour, such as excessive washing, counting, checking and the like.

Such anxiety disorders are usually treated by means of behavioural therapy, medication and the like wherein such means is usually undertaken by a professional, such as a psychologist, medical doctor and the like. However, the costs for the services of such professionals are usually prohibitive, and not available to most sufferers. Furthermore, certain anxiety disorders are best treated when a sufferer has a relapse or is experiencing an episode.

As such, they need therefore exists for an inexpensive means for not only detecting certain anxiety disorders, but also, in certain Instances, providing a remedy.

It is to be understood that, if any prior art information is referred to herein, such reference does not constitute an admission that the Information forms part of the common general knowledge in the art, in Australia or any other country.

Summary

According to one aspect of the present invention, a mobile computing device for calculating vitality indicia is provided, the mobile computing device comprising:

a processor for processing digital data;

a memory device for storing digital data including computer program code and being coupled to the processor:
an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor,

one or more sensors for capturing environment input data and being coupled to the processor, wherein the processor is controlled by the computer program code to:

receive, from the one or more sensors, the environment input data,
calculate the vitality Indicia in accordance with the environment input data, and
display, using the augmented reality display device, the vitality Indicia.

Preferably in one form, the calculating of the vitality Indicia comprises detecting a user anxiety disorder wherein the calculating of the vitality Indicia comprises calculating the occurrence of the anxiety disorder.

Advantageously, the mobile computing device is adapted for monitoring one or more vitality indica of a person in an automated manner such that corrective action may be taken should any of the vitality Indica indicate a potential problem.

Preferably, the environment input data comprises image data.

Preferably, in calculating the vitality Indicia, the processor is further controlled by the computer program code to calculate the vitality indica in accordance with an image recognition technique applied to the image data.

Advantageously, the mobile computing device is adapted for obtaining Information from a user's surroundings or from a patient so as to be able to obtain the vitality indica.

Preferably, the image recognition technique is adapted for recognising an object.

Preferably, the object is a meal and wherein the processor is controlled by the computer program code to:

calculate the nutritional composition of the meal; and
calculate the vitality Indicia in accordance with the nutritional composition.

Advantageously, the mobile computing device is adapted for monitoring a user's daily nutritional Intake, so as to be able to measure whether the intake is adequate or Inadequate.

Preferably, the processor is further controlled by the computer program code to calculate nutritional deficiency in accordance with the nutritional composition.
[26] Advantageously, the mobile computing device can determine from what a person is eating and drinking whether there is a nutritional deficiency in their diet.

[27] Preferably, the vitality indicia comprises a meal suggestion or plan and the processor is further controlled by the computer program code to calculate the meal suggestion or plan in accordance with the nutritional deficiency.

[28] Advantageously, the mobile computing device is adapted for recommending a meal suggestion or plan which, when taken by the user, would aim to correct the balance of the user's nutritional requirements.

[29] Preferably, the image recognition technique is adapted for recognising an action of a person.

[30] Preferably, the person is a wearer of the augmented reality display device.

[31] Preferably, the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

[32] Advantageously, the mobile computing device is adapted for monitoring certain activities of the user in the calculation of the vitality indicia.

[33] Preferably, the action represents compliance with a treatment regime.

[34] Advantageously, the mobile computing device is adapted for determining whether a person is adhering to a treatment regime, by monitoring the actions of the user.

[35] Preferably, the action represents actions selected from the set of actions comprising: coughing, sneezing and blinking actions.

[36] Advantageously, the mobile computing device is adapted for detecting various symptoms, each of which may be indicative of illness.

[37] Preferably, the vitality indicia represents a level of awakenss or tiredness.

[38] Advantageously, a person can get a more objective view on how awake or tired they are, so can plan their day accordingly.

[39] Preferably, at least one sensor of the one or more sensors comprises a rearward facing image capture device adapted for capturing image data relating to at least a part of the face of the user.

[40] Advantageously, the mobile computing device is adapted for detecting various symptoms on at least a part of the face of the user, which may be indicative of their vitality, for example, of an illness.
[41] Preferably, the at least a part of the face of the user is at least a part of an eye of the user and wherein the processor is further controlled by the computer program code to calculating the vitality Indicia in accordance with a characteristic of the eye.

[42] Advantageously, the mobile computing device is adapted for detecting various symptoms on or within an eye of the user, which may be indicative of their vitality, for example, of awareness, stress, eye disease or another illness.

[43] Preferably, the characteristic of the eye is one characteristic from the following set of characteristics:

(i) redness

(ii) swelling; and

(iii) dark ring.

[44] Advantageously, by monitoring these characteristics, the mobile computing device can readily suggest to the user that they may be tired or stressed.

[45] Preferably, the augmented reality display device comprises a view-through means and a transparency control means which is controlled by the processor, the view-through means comprising at least a portion having a transparency that can be adjusted by the transparency control means, and the processor is controlled by the computer program code to instruct the control means to darken the at least a portion of the view-through means in accordance with the characteristic of the eye.

[46] Advantageously, the transparency can be automatically turned down, that is the view-through means can be made darker, for tired or irritated eyes.

[47] Preferably, at least one sensor of the one or more sensors comprises a forward facing image capture device is adapted for capturing image data from within a wearers field of vision.

[48] Advantageously, a doctor can simply look at a patient to determine aspects of their vitality.

[49] Preferably, at least one sensor of the one or more sensors is a temperature sensor and the vitality Indicia represents a body temperature of a wearer of the augmented reality display device determined in accordance with data received from the temperature sensor.

[50] Advantageously, temperature can be a factor used in expressing or determining a person's vitality and in diagnosis of an illness, such as a fever.

[51] Preferably, the environmental input data comprises audio data.
Preferably, in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality Indicia in accordance with an audio recognition technique.

Preferably, the audio recognition technique is adapted for recognising sounds within the audio data.

Advantageously, the mobile computing device is adapted for calculating the vitality indicia by using sounds from the environment of the user or sounds made by the user.

Preferably, the sound is selected from the set of sounds comprising: coughing, hiccupping, sneezing and obstructed airways sounds.

Advantageously, the mobile computing device is adapted for detecting one or more symptoms which may be indicative of illness in the case of coughing, hiccupping, sneezing or a sleep disorder in the case of obstructed airways sounds.

Preferably, at least one sensor of the one or more sensors comprises a stethoscope Interface for receiving audio from a stethoscope in use.

Advantageously, a person’s heartbeat or lung condition can be monitored and can be used in deriving a diagnosis.

Preferably, the environmental input data comprises acceleration data.

Preferably, in calculating the vitality Indicia, the processor is further controlled by the computer program code to calculate the vitality indicia in accordance with a movement recognition technique applied to the acceleration data.

Preferably, the movement recognition technique comprises recognising a movement.

Advantageously, the mobile computing device is adapted for calculating the vitality Indicia in accordance with a movement of the user.

Preferably, the movement represents an exercise movement selected from the set of exercise movements comprising walking, talking and running exercise movements.

Advantageously, a person’s physical exercise which has a significant impact on their vitality can be monitored and this can be expressed in the vitality Indicia. For example, if the person is not doing enough physical exercise a bar chart may indicate this.
Preferably, the movement comprises at least a vibrational component and the processor is further controlled by the computer program code to diagnose Instances of sleep disordered breathing in accordance with the movement.

Preferably, the environmental input data further comprises audio data and in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality indicia in accordance with an audio recognition technique that is adapted for recognising sleep disordered breathing sounds within the audio data.

Advantageously, sleep disordered breathing can be diagnosed from both accelerometer and audio Inputs or can be diagnosed with a higher degree of confidence by correlating the environmental input data from both sources.

Preferably, the environment input data comprises orientation data.

Preferably, in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality indicia in accordance with an orientation recognition technique.

Preferably, the orientation recognition technique is adapted for recognising an orientation of a wearer of the augmented reality display device in use.

Advantageously, the mobile computing device is adapted for calculating the vitality indicia in accordance with orientation of the wearer, wherein the orientation may be representative of the sleeping state of the user.

Preferably, the processor is further controlled by the computer program code to calculate the resting state of a wearer of the augmented reality display device in accordance with the orientation.

Preferably, the mobile computing device further comprises a data Interface for sending and receiving data across a data network, the data interface being coupled to the processor, wherein the processor is controlled by the computer program code to send, via the data Interface, the environment input data.

Preferably, the processor is further controlled by the computer program code to send the environment input data to an application server.

Advantageously, the mobile computing device is adapted for offloading certain processing tasks to a remote application server having superior processing capabilities.
Preferably, the processor is further controlled by the computer program code to send the environment input data via a communications interface to another mobile computing device.

Advantageously, information from a friend, doctor or patient's mobile computing device can be shared so that additional environmental data can be used in calculation of the vitality data and/or in making a diagnosis.

Preferably, the processor is further controlled by the computer program code to send the environment input data to another mobile computing device when a wearer of the augmented reality display device of the mobile computing device looks at a wearer of the augmented reality display device of the other mobile computing device.

Advantageously, sharing can take place on a restricted basis.

Preferably, the processor is further controlled by the computer program code to receive, via the data interface, vitality Indicia data representing the vitality indicia.

Preferably, the processor is further controlled by the computer program code to receive the vitality Indicia data from an application server.

Preferably, the processor is further controlled by the computer program code to receive other environment input data from another mobile computing device and to calculate the vitality Indicia further in accordance with the other environment Input data.

Advantageously, Information from a friend, doctor or patient's mobile computing device can be shared so that additional environmental data can be used in calculation of the vitality data and/or in making a diagnosis.

Preferably, the processor is further controlled by the computer program code to calculate a vitality category in accordance with the environment Input data.

Advantageously, the mobile computing device is adapted for categorising the vitality Indica of the user into an Intelligible or easy to understand format.

Preferably, the processor is further controlled by the computer program code to calculate a diagnosis data in accordance with the environment Input data.

Advantageously, the mobile computing device is adapted for calculating a diagnosis using the environment input data or the vitality indicia. These diagnosis may be determined, for example, from a lookup table correlating symptoms and diagnoses, from an addition of scores correlating symptoms to diagnoses or using an
algorithm, such as an artificial intelligence algorithm, to determine the diagnosis or possible diagnoses that best fit the symptoms, expressed by either of the environment input data or the vitality indicia, by such an algorithm analysing prior patient data such as data that correlates diagnoses with symptoms.

[88] Preferably, the processor is further controlled by the computer program code to calculate one or more appropriate remedies in accordance with the diagnosis data.

[89] Advantageously, the mobile computing device is adapted to determine remedies for various diagnoses. These remedies may be determined, for example, from a lookup table, from an addition of scores correlating to diagnoses or using an algorithm, such as an artificial Intelligence algorithm, to determine the remedy or remedies that best fit a diagnosis by the algorithm analysing prior patient data such as data that correlates diagnoses with remedies that have been effective.

[90] Preferably, the one or more remedies are each a remedy from the following set of remedies:

(i) a medication
(ii) an exercise
(iii) a diet suggestion
(iv) a lifestyle suggestion
(v) a therapy suggestion
(vi) a product suggestion

[91] Preferably, the vitality Indicia comprises the one or more remedies.

[92] Advantageously, the vitality Indicia may express possible remedies to a user of the mobile computing device.

[93] Preferably, the one or more remedies are communicated to a user of the mobile computing device audibly.

[94] Advantageously, the remedies may be understood by a person who is blind or has Impaired vision.

[95] Preferably, the one or more remedies comprise a branded product suggestion.

[96] Advantageously, a manufacturer, distributor or service provider can advertise branded remedies to the user. For example, if the diagnosis is a common cold and the remedy is cough medicine, vitality indicia in the form of a suggestion can be
provided to the user such as, "Sir, it appears you have caught a cold, why not try
Brand cough medicine?"

[97] Preferably, the one or more remedies is a branded medication remedy.

[98] Preferably, the mobile computing device further comprises a data
communications interface and wherein in calculating the diagnosis data, the
processor is controlled by the computer program code to send the environment input
data to a server via the data communications interface and receive back from the
server, the diagnosis data.

[99] Advantageously, the mobile computing device is adapted for offloading certain
processing tasks to a remote application server having superior processing
capabilities.

[100] Preferably, the mobile computing device further comprises a data
communications interface and wherein in calculating the one or more remedies, the
processor is controlled by the computer program code to send the diagnosis data to
a server via the data communications interface and receive back from the server, the
one or more remedies.

[101] Advantageously, the mobile computing device is adapted for offloading certain
processing tasks to a remote application server having superior processing
capabilities.

[102] Preferably, the one or more sensors is two or more sensors and the processor
is further controlled by the computer program code to calculate the diagnosis in
accordance with environment data received from at least two sensors of the two or
more sensors.

[103] Advantageously, a diagnosis formed on the basis of multiple observations of a
patient can be made with a higher degree of confidence.

[104] Preferably, the one or more sensors is two or more sensors and the processor
is further controlled by the computer program code to calculate the diagnosis in
accordance with environment data received from a threshold one or more sensors of
the two or more sensors.

[105] Advantageously, where it is necessary for a particular symptom to be present
for a particular diagnosis to be possible, this feature allows the mobile computing
device to check that the particular symptom is present before making the diagnosis.
Preferably, the one or more sensors is two or more sensors and the processor is further controlled by the computer program code to calculate the diagnosis in accordance with a weighting of the environment data according to which sensor it is received from.

Advantageously, where the presence of one symptom is more indicative of a particular diagnosis than another, that symptom can be given a greater weight by the mobile computing device in forming the diagnosis. Preferably, the augmented reality display devices is a pair of glasses and the at least one of the one or more sensors is located at a region selected from the following set of regions of the glasses in relation to a wearer of the glasses:

1. the bridge of the nose
2. the forehead
3. a temple
4. above an ear
5. behind an ear
6. adjacent an opening of the ear; and
7. inside an ear canal

Advantageously, in some cases a temperature sensor can be located at a position more preferable for measuring a person's body temperature.

The advantages of the preferable features of the mobile computing device are also provided by the corresponding features of the following aspects of the invention. According to another aspect of the present invention, an application server for calculating vitality indicia data is provided, the application server comprising:

- a processor for processing digital data;
- a memory device for storing digital data including computer program code and being coupled to the processor:
  - a data interface for sending and receiving data across a data network and being coupled to the processor, wherein the processor is controlled by the computer program code to:
    - receive, via the data interface, environment input data.
    - calculate the vitality indicia data in accordance with the environment input data, the vitality indicia date being adapted for display by an augmented reality display device, and
send, via the data interface the vitality indicia data to an augmented reality display device.

[112] Preferably, the environment input data comprises image data.

[113] Preferably, in calculating the vitality Indicia, the processor is further controlled by the computer program code to calculate the vitality Indicia data in accordance with an image recognition technique applied to the image data.

[114] Preferably, the image recognition technique is adapted for recognising an object.

[115] Preferably, the object is a meal and wherein the processor is controlled by the computer program code to:

- calculate the nutritional composition of the meal; and
- calculate the vitality indicia in accordance with the nutritional composition.

[116] Preferably, the processor is further controlled by the computer program code to calculate nutritional deficiency in accordance with the nutritional composition.

[117] Preferably, the vitality indicia data comprises a meal suggestion or plan and the processor is further controlled by the computer program code to calculate the meal suggestion or plan in accordance with the nutritional deficiency.

[118] Preferably, the image recognition technique is adapted for recognising an action of a person.

[119] Preferably, the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

[120] Preferably, the action represents compliance with a treatment regime.

[121] Preferably, the action represents actions selected from the set of actions comprising: coughing, sneezing, wincing and blinking actions.

[122] Preferably, the vitality indicia represents a level of awakness or tiredness.

[123] Preferably, the processor is controlled by the computer program code to receive, via the data Interface, the environment Input data from a wearable rearward facing image capture device adapted for capturing image data relating to at least a part of the face of a wearer.

[124] Preferably, the at least a part of the face of the user is at least a part of an eye of the user and wherein the processor is further controlled by the computer program
code to calculating the vitality indicia data in accordance with a characteristic of the eye.

[125] Preferably, the characteristic of the eye is one characteristic from the following set of characteristics:

- (i) redness
- (ii) swelling; and
- (iii) dark ring.

[126] Preferably, the processor is adapted to send, via the data interface, an instruction to the augmented reality display device to darken a view-through means of the augmented reality display device in accordance with the vitality indicia data.

[127] Preferably, the environment input data comprises a temperature reading of a wearer of the augmented reality display device.

[128] Preferably, the environmental input data comprises audio data.

[129] Preferably, in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality indicia in accordance with an audio recognition technique.

[130] Preferably, the audio recognition technique is adapted for recognising sounds within the audio data.

[131] Preferably, the sound is selected from the set of sounds comprising: coughing, hiccupping, sneezing and obstructed airways sounds.

[132] Preferably, the processor is further controlled by the computer program code to receive, via the data interface, the environment sensor data in the form of data from a stethoscope.

[133] Preferably, the environmental input data comprises acceleration data.

[134] Preferably, in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality indicia in accordance with a movement recognition technique applied to the acceleration data.

[135] Preferably, the movement recognition technique comprises recognising a movement.

[136] Preferably, the movement represents an exercise movement selected from the set of exercise movements comprising walking, talking and running exercise movements.
Preferably, the movement comprises at least a vibrational component and the processor is further controlled by the computer program code to diagnose instances of sleep disordered breathing in accordance with the movement.

Preferably, the environmental input data further comprises audio data and in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality Indicia in accordance with an audio recognition technique that is adapted for recognising sleep disordered breathing sounds within the audio data.

Preferably, the environment input data comprises orientation data.

Preferably, in calculating the vitality Indicia, the processor is further controlled by the computer program code to calculate the vitality Indicia in accordance with an orientation recognition technique.

Preferably, the orientation recognition technique is adapted for recognising an orientation of a wearer of the augmented reality display device in use.

Preferably, the processor is further controlled by the computer program code to calculate the resting state of a wearer of the augmented reality display device in accordance with the orientation.

Preferably, the processor is further controlled by the computer program code to send the environment input data to another mobile computing device.

Preferably, the processor is further controlled by the computer program code to send the environment input data to another mobile computing device when a wearer of the augmented reality display device of the mobile computing device looks at a wearer of the augmented reality display device of the another mobile computing device.

Preferably, the processor is further controlled by the computer program code to calculate a vitality category in accordance with the environment input data.

Preferably, the processor is further controlled by the computer program code to calculate a diagnosis data in accordance with the environment input data.

Preferably, the processor is further controlled by the computer program code to calculate one or more appropriate remedies in accordance with the diagnosis data.

Preferably, the one or more remedies are each a remedy from the following set of remedies:
(i) a medication
(ii) an exercise
(Hi) a diet suggestion
(iv) a lifestyle suggestion
(v) a therapy suggestion
(vi) a product suggestion

[149] Preferably, the vitality Indicia comprises the one or more remedies.

[150] Preferably, the application server is adapted to send Instructions to the augmented reality display device to communicate the one or more remedies audibly to the wearer.

[151] Preferably, the one or more remedies comprise a branded product suggestion.

[152] Preferably, the one or more remedies is a branded medication remedy.

[153] Preferably, the environment data comprises at least two types of environment data and wherein the processor is further controlled by the computer program code to calculate the diagnosis in accordance with the at least two types of environment data.

[154] Preferably, the application server is further adapted to calculate the diagnosis in accordance with a threshold number of types of environment data.

[155] Preferably, the application server is further adapted to calculate the diagnosis in accordance with a weighting of the types of environment data.

[156] According to another aspect of the present invention, a computer readable storage medium for calculating a vitality Indicia is provided, the computer readable storage medium having computer program code Instructions recorded thereon, the computer program code Instructions being executable by a computer and comprising:

Instructions for receiving environment Input data from one or more sensors:
Instructions for calculating the vitality indicia in accordance with the environment input data, and

instructions for displaying, using an augmented reality display device, the vitality Indicia.

[157] Preferably, the environment input data comprises image data.
Preferably, further comprising instructions for calculating the vitality Indicia in accordance with an image recognition technique applied to the image data.

Preferably, the image recognition technique is adapted for recognising an object.

Preferably, the object is a meal and further comprising; instructions for calculating the nutritional composition of the meal; and instructions for calculating the vitality Indicia in accordance with the nutritional composition.

Preferably, further comprising Instructions for calculating nutritional deficiency in accordance with the nutritional composition.

Preferably, the vitality Indicia comprises a meal suggestion or plan and the computer readable storage medium further comprises Instructions for calculating the meal suggestion or plan in accordance with the nutritional deficiency.

Preferably, the image recognition technique is adapted for recognising an action of a person.

Preferably, the person is a wearer of the computer readable storage medium.

Preferably, the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

Preferably, the action represents compliance with a treatment regime.

Preferably, the action represents actions selected from the set of actions comprising: coughing, sneezing, wincing and blinking actions.

Preferably, the vitality indicia represents a level of awenness or tiredness.

Preferably, further comprising instructions for receiving data from a rearward facing image capture device adapted for capturing image data relating to at least a part of the face of the wearer of the augmented reality display device.

Preferably, the at least a part of the face of the user is at least a part of an eye of the user and wherein the computer readable storage means further comprises Instructions for calculating the vitality Indica in accordance with a characteristic of the eye.

Preferably, the characteristic of the eye is one characteristic from the following set of characteristics:

(i) redness
(ii) swelling; and
(iii) dark ring.

[172] Preferably, the augmented reality display device comprises a view-through means and a transparency control means, the view-through means comprising at least a portion having a transparency that can be adjusted by the transparency control means, and the computer readable storage medium comprises instructions for the control means to darken the at least a portion of the view-through means in accordance with the vitality indicia.

[173] Preferably, the environment input data is temperature data of a wearer of the augmented reality device.

[174] Preferably, the environmental input data comprises audio data.

[175] Preferably, further comprising Instructions for calculating the vitality Indicia in accordance with an audio recognition technique.

[176] Preferably, the audio recognition technique is adapted for recognising sounds from within the audio data.

[177] Preferably, the sound is selected from the set of sounds comprising: coughing, hiccupping, sneezing and obstructed airways sounds.

[178] Preferably, the environment data comprises data received from a stethoscope.

[179] Preferably, the environmental input data comprises acceleration data.

[180] Preferably, further comprising Instructions for calculating the vitality Indicia in accordance with a movement recognition technique.

[181] Preferably, the movement recognition technique comprises recognising a movement.

[182] Preferably, the movement represents an exercise movement selected from the set of exercise movements comprising walking, talking and running exercise movements.

[183] Preferably, the movement comprises at least a vibrational component and the computer readable storage medium further comprises Instructions to diagnose Instances of sleep disordered breathing in accordance with the movement.

[184] Preferably, the environmental input data further comprises audio data and in calculating the vitality Indicia, the computer readable storage medium further comprises instructions to calculate the vitality Indicia in accordance with an audio
recognition technique that is adapted for recognising sleep disordered breathing sounds within the audio data.

[185] Preferably, the environment input data comprises orientation data
[186] Preferably, further comprising instructions for calculating the vitality indicia in accordance with an orientation recognition technique.
[187] Preferably, the orientation recognition technique is adapted for recognising an orientation of a wearer of the augmented reality display device in use.
[188] Preferably, further comprising Instructions for calculating the resting state of a wearer of the augmented reality display device in accordance with the orientation.
[189] Preferably, further comprising instructions for sending, via a data interface, the environment input data.
[190] Preferably, further comprising Instructions for sending the environment input data to an application server.
[191] Preferably, the computer readable storage medium comprises further Instructions to send the environment input data to another mobile computing device.
[192] Preferably, the computer readable storage medium further comprises Instructions to send the environment input data to another mobile computing device when a wearer of the augmented reality display device of the mobile computing device looks at a wearer of the augmented reality display device of the another mobile computing device.
[193] Preferably, further comprising Instructions for receiving vitality indicia data representing the vitality Indicia.
[194] Preferably, further comprising instructions for receiving the vitality indicia data from an application server.
[195] Preferably, further comprising Instructions to receive other environment input data from another mobile computing device and to calculate the vitality Indicia further in accordance with the other environment input data.
[196] Preferably, further comprising Instructions for calculating a vitality category in accordance with the environment Input data.
[197] Preferably, further comprising Instructions for calculating a diagnosis in accordance with the environment input data.
[198] Preferably, comprising Instructions for calculating one or more appropriate remedies in accordance with the diagnosis data.
Preferably, the one or more remedies are each a remedy from the following set of remedies:

(I) a medication
(ii) an exercise
(iii) a diet suggestion
(iv) a lifestyle suggestion
(v) a therapy suggestion; and
(vi) a product suggestion

Preferably, the vitality indicia comprises the one or more remedies.

Preferably, further comprising Instructions to communicate the one or more remedies to a user of the augmented reality device audibly.

Preferably, the one or more remedies comprise a branded product suggestion.

Preferably, the one or more remedies is a branded medication remedy.

Preferably, further comprising Instructions to send the environment input data to a server and receive back from the server, the diagnosis data.

Preferably, further comprising instructions to send the diagnosis data to a server and receive back from the server, the one or more remedies.

Preferably, the environment data comprises at least two types of environment data and the computer readable storage medium further comprises Instructions to calculate the diagnosis in accordance with the at least two types of environment data.

Preferably, further comprising Instructions to calculate the diagnosis in accordance with a threshold number of types of environment data.

Preferably, further comprising instructions to calculate the diagnosis in accordance with a weighting of the types of environment data.

According to yet another aspect of the present Invention, a system for calculating a vitality Indicia is provided, the system comprising:

a wearable device; and

an application server wherein:

the application server is adapted to receive environment input data from the wearable device,
the application server is adapted to calculate the vitality indicia in accordance with the environment input data, and
the application server is adapted to send vitality Indicia data representing the vitality Indicia to the wearable device.

[210] Preferably, the wearable device comprises a display device, and wherein the wearable device is adapted to display the vitality Indicia data.

[211] Preferably, the wearable display device is an augmented reality display device.

[212] Preferably, the vitality indicia data is adapted for display in segmented reality by the augmented reality display device.

[213] Preferably, the environment input data comprises image data.

[214] Preferably, in calculating the vitality indicia, the application server is adapted to calculate the vitality Indicia in accordance with an image recognition technique applied to the image data.

[215] Preferably, the image recognition technique is adapted for recognising an object.

[216] Preferably, the object is a meal and wherein the application server is further adapted to:

calculate the nutritional composition of the meal; and

calculate the vitality indicia in accordance with the nutritional composition.

[217] Preferably, the application server is adapted to calculate nutritional deficiency in accordance with the nutritional composition.

[218] Preferably, the application server is adapted to calculate a meal suggestion or plan in accordance with the nutritional deficiency.

[219] Preferably, the image recognition technique is adapted for recognising an action of a person wearing the wearable device.

[220] Preferably, the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

[221] Preferably, the action represents compliance with a treatment regime.

[222] Preferably, the action represents actions selected from the set of actions comprising: coughing, sneezing, wincing and blinking actions.

[223] Preferably, the vitality indicia represents a level of awareness or tiredness.
Preferably, the wearable device comprises a rearward facing image capture device adapted for capturing image data relating to at least a part of the face of a wearer.

Preferably, the at least a part of the face of the user is at least a part of an eye of the wearer and wherein the server calculates the vitality Indicia in accordance with a characteristic of the eye.

Preferably, the characteristic of the eye is one characteristic from the following set of characteristics:

1. redness
2. swelling; and
3. dark ring.

Preferably, the wearable device comprises a view-through means and a transparency control means, the view-through means comprising at least a portion having a transparency that can be adjusted by the transparency control means, and the server controls the control means to darken the at least a portion of the view-through means in accordance with the vitality indicia.

Preferably, the wearable device comprises at least one temperature sensor and the environmental input data comprises temperature data received from the at least one temperature sensor.

Preferably, the environmental input data comprises audio data.

Preferably, in calculating the vitality Indicia, the application server is adapted to calculate the vitality indicia in accordance with an audio recognition technique.

Preferably, the audio recognition technique is adapted for recognising sounds within the audio data.

Preferably, the sound is selected from the set of sounds comprising: coughing, hiccupping, sneezing and obstructed airways sounds.

Preferably, the wearable device further comprises a stethoscope Interface adapted for receiving the audio data from a stethoscope in use.

Preferably, the environmental input data comprises acceleration data.

Preferably, in calculating the vitality indicia, the application server is adapted to calculate the vitality Indicia in accordance with a movement recognition technique applied to the acceleration data.
Preferably, the movement recognition technique comprises recognizing a movement.

Preferably, the movement represents an exercise movement selected from the set of exercise movements comprising walking, talking and running exercise movements.

Preferably, the movement comprises at least a vibrational component and the server is adapted to diagnose instances of sleep disordered breathing in accordance with the movement.

Preferably, the environmental input data further comprises audio data and in calculating the vitality indicia, the server is adapted to calculate the vitality indicia in accordance with an audio recognition technique that is, in turn, adapted for recognizing sleep disordered breathing sounds within the audio data.

Preferably, the environment input data comprises orientation data.

Preferably, in calculating the vitality indicia, the application server is adapted to calculate the vitality indicia in accordance with an orientation recognition technique.

Preferably, the orientation recognition technique is adapted for recognizing an orientation of a wearer in use.

Preferably, the application server is adapted to calculate the resting state of a wearer of the application server in accordance with the orientation.

Preferably, the server is adapted to send the environment input data to another wearable device.

Preferably, the server is adapted to send the environment input data to another wearable device when a wearer of the wearable device of the mobile computing device looks at a wearer of the another wearable device.

Preferably, the server is adapted to receive other environment input data from another wearable device and to calculate the vitality indicia further in accordance with the other environment input data.

Preferably, the server is further adapted to calculate a vitality category in accordance with the environment input data.

Preferably, the server is further adapted to calculate a diagnosis data in accordance with the environment input data.
Preferably, the server is further adapted to calculate one or more appropriate remedies in accordance with the diagnosis data.

Preferably, the one or more remedies are each a remedy from the following set of remedies:

(i) a medication
(ii) an exercise
(iii) a diet suggestion
(iv) a lifestyle suggestion
(v) a therapy suggestion; and
(vi) a product suggestion

Preferably, the vitality Indicia comprises the one or more remedies.

Preferably, the one or more remedies are communicated to a wearer of the wearable device audibly.

Preferably, the one or more remedies comprise a branded product suggestion.

Preferably, the one or more remedies is a branded medication remedy.

Preferably, the environment data comprises at least two types of environment data and wherein the server is adapted to calculate the diagnosis in accordance with the at least two types of environment data.

Preferably, the application server is further adapted to calculate the diagnosis in accordance with a threshold number of types of environment data.

Preferably, the application server is further adapted to calculate the diagnosis in accordance with a weighting of the types of environment data.

Preferably, the wearable device is a pair of augmented reality glasses comprising one or more sensors and at least one of the one or more sensors is located at a region selected from the following set of regions of the glasses in relation to a wearer of the glasses:

(i) the bridge of the nose
(ii) the forehead
(iii) a temple
(iv) above an ear
(v) behind an ear
(vi) adjacent an opening of the ear; and
(vii) inside an ear canal

[259] According to another aspect, there is provided a mobile computing device for calculating vitality indicia, the mobile computing device comprising:

- a processor for processing digital data;
- a memory device for storing digital data including computer program code and being coupled to the processor;
- an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor;
- at least one sensors for capturing sensor input data and being coupled to the processor, wherein the processor is controlled by the computer program code to:
  - receive, from the at least one sensor, the sensor input data,
  - calculate the vitality indicia in accordance with the sensor input data, and
  - display, using the augmented reality display device, the vitality indicia.

[260] Preferably, the mobile computing device further comprises a user interface for sending and receiving user input data via the augmented reality device, the user interface being coupled to the processor, wherein the processor is controlled by the computer program code to calculate the vitality Indicia in accordance with at least the user input data.

[261] Advantageously, the device can communicate with an external data network in an automated manner to send and receive user input data to assist in the diagnosis of the user.

[262] Preferably, the processor is controlled by the computer program code to calculate first body posture data representing a first body posture in accordance with the sensor input data and wherein the processor is controlled by the computer program code to calculate the vitality Indicia in accordance with the first body posture data.

[263] Advantageously, the computer program code can interpret sensor input data in an automated manner, which may not be manual inputs that the user consciously makes, and the user's vitality indicia is calculated for that given posture or motion.

[264] Preferably, the processor is controlled by the computer program code to calculate second body posture data representing a second body posture in accordance with the sensor input data and wherein the processor is controlled by the
computer program code to calculate the vitality indicia further in accordance the second body posture data.

[265] **Advantageously,** the computer program code can interpret proceeding sensor input data as changes to the user's initial posture or motion in an automated manner, and again are not manual Inputs made consciously by the user, to further calculate the vitality Indicia.

[266] Preferably, the at least one sensor comprises an image capture device and wherein the processor is controlled by the computer program code to calculate the first posture data further in accordance with image data from the image capture device.

[267] **Preferably,** the image capture device is a stereoscopic image capture device and wherein the processor is controlled by the computer program code to calculate the first body posture further in accordance with stereoscopic image data from the stereoscopic image capture device.

[268] Advantageously, a stereoscopic image capture device is able to visualise image data in a way that can determine depth between any reference points in an automated manner without the user requiring to define distances and locations of their body with respect to the environment.

[269] Preferably, the at least one sensor comprises an orientation sensor adapted for generating orientation data and wherein the processor is further controlled by the computer program code to calculate the first posture data further in accordance with the orientation data.

[270] Advantageously, an orientation sensor is used to accurately measure further posture data.

[271] Preferably, the processor is further controlled by the computer program code to calculate if the a first body posture exceeds a posture range threshold.

[272] Advantageously, the computer program code has stored Information pertaining to the normal ranges of movement unique to the user, and determine at any time when the user has made a significant change from their desired movement or posture, and so corrective action can be taken.

[273] Preferably, the posture range threshold represents a height range threshold.

[274] Preferably, the posture range threshold represents an angular range threshold.
[275] Preferably, in calculating a first body posture, the processor is controlled by the computer program code to calculate reference point data representing a reference point using the image data and calculate the first body posture further in accordance with the reference point data.

[276] Advantageously, as part of calculating body posture data, the computer program code can assign reference points pertaining to both the user's body and external environment such that the user can move through any ranges of motion and still be traceable Irrespective of sensor orientation.

[277] Preferably, the mobile computing device further comprises a user input Interface for receiving user input data, and wherein the processor is controlled by the computer program code to receive, via the user Input device, reference point data representing a reference point and calculate the first body posture further in accordance with the reference point data.

[278] Preferably, the processor is controlled by the computer program code to calculate distance data representing a distance from the reference point in accordance with the reference point data.

[279] Preferably, the processor is further controlled by the computer program code to display, using the augmented reality display device, the first posture data.

[280] Advantageously, the posture data can be communicated to the user so the user can understand how their body movements and positions have changed over time.

[281] Preferably, the processor is further controlled by the computer program code to calculate remedial action data representing a remedial action in accordance with the first posture data.

[282] Advantageously, both the posture data and recommendations to correct the problem are shown to the user, and the user can more accurately make corrective actions while the device monitors this corrective action in an automated manner.

[283] Preferably, at least one sensor comprises a rearward facing image capture device adapted for capturing image data representing at least a part of the face of the wearer.

[284] Preferably, the at least a part of the face of the wearer is at least a part of an eye of the wearer.
[285] Preferably, the processor is controlled by the computer program code to calculate eye characteristic data representing an eye characteristic and calculate the vitality Indicia further in accordance with the eye characteristic.

[286] Advantageously, the rearwards-facing camera can be adapted to capture and analyse eye characteristics, in an automated manner.

[287] Preferably, the eye characteristic is selected from the set of eye characteristics comprising

i. redness;

ii. swelling;

iii. dark ring;

iv. iris colour;

v. pupil symmetry; and

vi. pupil size eye characteristics.

[288] Advantageously, the device can recognise characteristics of the user's eyes that may not initially have been diagnosed prior, and these may include redness, swelling, dark rings, iris colour, pupil symmetry and pupil size eye characteristics.

[289] Preferably, the processor is further controlled by the computer program code to calculate the eye characteristic data in accordance with a colour recognition technique.

[290] Advantageously, the computer program code can further calculate eye characteristic data using a colour recognition techniques applied to the image data.

[291] Preferably, the processor is further controlled by the computer program code to calculate the eye characteristic data in accordance with a movement recognition technique.

[292] Advantageously, the computer program code can further calculate eye characteristic data in terms of eye movements in an automated manner that may have been previously undiagnosed.

[293] Preferably, the processor is further controlled by the computer program code to calculate further eye characteristic data representing a further eye characteristic and calculate the vitality Indicia further in accordance with the further eye characteristic.
[294] Preferably, the processor is further controlled by the computer program code to compare the eye characteristic data against normal eye characteristic data representing a normal eye characteristic.

[295] Advantageously, the eye characteristic data is compared against a database that contains characteristics relating to normal, healthy and functioning eyes, to determine if the user’s eye characteristics vary significantly.

[296] Preferably, the eye characteristic data represents a pupil dilation state and wherein the at least one sensor further comprises an ambient light meter and wherein the processor is further controlled by the computer program code to receive, from the ambient light meter, ambient light data representing an ambient lighting level, and calculate the vitality indicia further in accordance with the ambient light data and the pupil dilation state.

[297] Advantageously, the vitality indicia can be calculated in accordance with the pupil dilation state and ambient light levels.

[298] Preferably, the further eye characteristic data represents a second pupil dilation state and wherein the processor is further controlled by the computer program code to calculate the vitality indicia further in accordance with the second pupil dilation state.

[299] Preferably, the processor is further controlled by the computer program code to receive, from the ambient light meter, further ambient light data representing a further ambient light level, and calculate the vitality indicia further in accordance with the further ambient light data.

[300] Advantageously, the vitality indicia can be calculated in accordance with changes in pupil size relative to changes in the ambient light levels.

[301] Preferably, at least one sensor comprises an audio sensor, and wherein the processor is further controlled by the computer program code to receive, from the audio sensor, audio data representing a voice command and calculate, using audio recognition technique, a command in accordance with the audio data.

[302] Preferably, the processor is further controlled by the computer program code to calculate the vitality indicia further in accordance with the command.

[303] Preferably, the mobile computing device further comprises user interface output being coupled to the processor for outputting user data and wherein the processor is further controlled by the computer program code to calculate prompt
data representing a prompt and output using the user interface output, the prompt data.

[304] Preferably, the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the prompt data.

[305] Preferably, the processor is further controlled by the computer program code to calculate further prompt data representing a further prompt in accordance with the command and output, using the user Interface output, the further prompt data.

[306] Preferably, the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the further prompt data.

[307] Preferably, the processor is further controlled by the computer program code to receive, from the audio sensor, further audio data representing a further voice command and calculate, using audio recognition technique, a further command in accordance with the further audio data.

[308] Preferably, the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the further command.

[309] Preferably, the processor is further controlled by the computer program code to calculate disease process data representing a disease in accordance with the vitality Indicia.

[310] Preferably, the processor is further controlled by the computer program code to receive, from the at least one sensor, further sensor input data and calculate the vitality Indicia further in accordance with the further sensor input data.

[311] Advantageously, the processor calculates remedy effectiveness data in accordance with further sensor input data in an automated manner, and the user's vitality Indicia is updated accordingly so the user can monitor changes to their wellbeing over time.

[312] Preferably, the processor is further controlled by the computer program code to select remedy data representing a remedy in accordance with the sensor input data and the further sensor input data.

[313] Preferably, the remedy is selected from the set of remedies comprising medication, exercise activity, diet suggestion, lifestyle suggestion, therapy suggestion and product suggestion remedies.
Preferably, the processor is further controlled by the computer program code to calculate remedy effectiveness data representing an effectiveness of the remedy in accordance with the further sensor input data.

Preferably, the mobile computing device further comprises a data interface for sending and receiving data across a data network, the data interface being coupled to the processor, wherein the processor is controlled by the computer program code to send, via the data interface, the remedy data.

Preferably, the at least one sensor is adapted to monitor blood oxygen saturation.

Preferably, the at least one sensor is adapted to monitor a breathing rate.

Preferably, the at least one sensor is adapted to monitor a heart rate.

Preferably, the at least one sensor is adapted to monitor a temperature.

Preferably, the mobile computing device further comprises a location sensing means for sensing a location, the location sensing means being coupled to the processor, wherein the processor is further controlled by the computer program code to receive, from the location sensing means, location data representing a location, and send, via the data interface, the location data.

Preferably, the processor is further controlled by the computer program code to select emergency contact data further in accordance with the vitality Indicia.

Preferably, the processor is further controlled by the computer program code to select a proximate mobile computing device and send, via the data interface, to the proximate mobile computing device the emergency data.

Advantageously, a wearer of a proximal mobile computing device can be sent the location data corresponding to the first wearer of a mobile computing device.

Preferably, the processor is controlled by the computer program code to display, using the augmented reality display device, medical assistance Instructions.

Preferably, the vitality indicia represents the wearer's stress level.
Preferably, the at least one sensor is adapted to capture sensor input data selected from the set of sensor input data comprising:

i. blood oxygen saturation;

ii. breathing rate;

iii. body temperature;

iv. heart rate data; and

v. perspiration level sensor input data.

Advantageously, the augmented reality display can be used to display the wearer's stress level in real-time.

Advantageously, the display of the wearer's stress level can be used in an application of a closed-loop biofeedback therapy method.

Preferably, the processor is controlled by the computer program code to display the wearer's stress level on the augmented reality display in a real-time graphical format.

According to another aspect, there is provided a mobile computing device for detecting an environmental hazard, the mobile computing device comprising:

- a processor for processing digital data;
- a memory device for storing digital data including computer program code and being coupled to the processor;
- an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor;
- at least one sensors for capturing sensor input data and being coupled to the processor, wherein the processor is controlled by the computer program code to:
  - receive, from the at least one sensor, the sensor input data,
  - detecting an environmental hazard with the sensor input data, and
  - display, using the augmented reality display device, the environmental hazard.

Preferably, the at least one sensor is an image capture device adapted for capturing image data, and wherein the processor is controlled by the computer program code to calculate the vitality Indicia in accordance with an image recognition technique and the image data.

Preferably, the processor is further controlled by the computer program code to recognise an object.
Preferably, the processor is further controlled by the computer program code to calculate whether the object is hazardous.

Preferably, the Image recognition technique comprises text recognition technique.

Preferably, the processor is further controlled by the computer program code to recognise text.

Advantageously, the text recognition technique is adapted to recognise text representing a hazardous substance.

Preferably, the processor is further controlled by the computer program code to calculate whether the text represents a hazardous substance.

Preferably, the mobile computing device further comprises a data interlace for sending and receiving data across a data network and being couple to the processor, and wherein the processor is further controlled by the computer program code, to send the text to a hazardous substance lookup service.

Preferably, the at least one sensor is a radiation measurement device adapted for generating radiation level data representing a radiation level, and wherein the processor is further controlled by the computer program code to detect the environmental hazard further in accordance with the radiation level data.

Preferably, the radiation measurement device is a UV radiation measurement device.

Preferably, the processor is further controlled by the computer program code to calculate radiation exposure data representing radiation exposure in accordance with the radiation level data and detect the environmental hazard further in accordance with the radiation exposure data.

Advantageously, the processor is adapted to calculate the hazard of UV exposure in accordance with the UV index level and radiation exposure level.

According to another aspect, there is provided a mobile computing device for vision assistance, the mobile computing device comprising:

- a processor for processing digital data;
- a memory device for storing digital data including computer program code and being coupled to the processor;
- an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor,
at least one sensor for capturing sensor input data and being coupled to the processor, wherein the processor is controlled by the computer program code to receive, from the at least one sensor, the sensor input data, calculate augmented image data representing an augmented image in accordance with the sensor Input data and a medical condition, and display, using the augmented reality display device, the augmented image.

[345] Preferably, at least one sensor comprises a rearward facing image capture device adapted for capturing image data representing at least a part of the face of a wearer.

[346] Preferably, the at least a part of the face of the wearer is at least a part of an eye of the wearer.

[347] Preferably, the processor is further controlled by the computer program code to calculate orientation data representing an orientation of the eye in accordance with the image data and calculate the augmented image data further in accordance with the orientation data.

[343] Advantageously, the device is able to calculate the augmented image data using the orientation of the eye.

[349] Preferably, the processor is further controlled by the computer program code to calculate a field of view data representing a field of view of the wearer in accordance with the orientation data and calculate the augmented image data further in accordance with the field of view data.

[350] Preferably, at least one sensor further comprises an forward facing image capture device.

[351] Preferably, the processor is further controlled by the computer program code to receive, from the forward facing image capture device, view image data representing a view of the wearer and calculate the augmented image data further in accordance with the view image data.

[352] Advantageously, the forward facing image capture device is able to capture image data of the wearer’s surroundings relating to the wearer’s predicted field of view.

[353] Preferably, the mobile computing device further comprises a user Interface for receiving user Input data and being coupled to the processor, wherein the processor is controlled by the computer program code to receive, from the user Interface, vision
abnormality data representing a vision abnormality, and calculate the augmented image data further in accordance with the vision abnormality data.

[354] Preferably, the vision abnormality data comprises blind spot data representing a blind spot.

[355] Advantageously, the vision abnormality data can be used to generate blind spot data that represents the blind spot of the wearer.

[356] Preferably, the processor is further controlled by the computer program code to calculate blind spot image data representing a portion of an image within the wearer's blind spot in accordance with the view image data and the blind spot data.

[357] Advantageously, the processor would adapt video of the view of the wearer to be displayed within a field of view such that it is visible to them, broadening their field of view.

[358] Preferably, the augmented image data comprises a superimposition of the blind spot image data and the view image data.

[359] According to another aspect, there is provided an application server for calculating vitality Indicia, the application server comprising;

- a processor for processing digital data:
  - a memory device for storing digital data including computer program code and being coupled to the processor;
- a data interface for sending and receiving data across a data network and being coupled to the processor, wherein the processor is controlled by the computer program code to:
  - receive, from the data interface, sensor input data,
  - calculate the vitality Indicia in accordance with the sensor input data, and
  - send, via the data interface, the vitality Indicia.

[360] Preferably, the processor is controlled by the computer program code to:

- receive, from the data interface, user input interface data representing user input, and
- calculate the vitality Indicia in accordance with at least the user input data.

[361] Preferably, the processor is controlled by the computer program code to calculate first body posture data representing a first body posture in accordance with the sensor input data and wherein the processor is controlled by the computer
program code to calculate the vitality indicia in accordance with the first body posture data.

[362] Preferably, the processor is controlled by the computer program code to calculate second body posture data representing a second body posture in accordance with the sensor input data and wherein the processor is controlled by the computer program code to calculate the vitality indicia further in accordance the second body posture data.

[363] Preferably, the sensor data represents image data and wherein the processor is controlled by the computer program code to calculate the first posture data further in accordance with the image data.

[364] Preferably, the image data is stereoscopic image data and wherein the processor is controlled by the computer program code to calculate the first body posture further in accordance with the stereoscopic image data.

[365] Preferably, the sensor input data represents orientation data and wherein the processor is further controlled by the computer program code to calculate the first posture data further in accordance with the orientation data.

[366] Preferably, the processor is further controlled by the computer program code to calculate if the a first body posture exceeds a posture range threshold.

[367] Preferably, the posture range threshold represents a height range threshold.

[368] Preferably, the posture range threshold represents an angular range threshold.

[369] Preferably, in calculating a first body posture, the processor is controlled by the computer program code to calculate reference point data representing a reference point using the image data and calculate the first body posture further in accordance with the reference point data.

[370] Preferably, the processor is controlled by the computer program code to receive, via the data interface, reference point data representing a reference point and calculate the first body posture further in accordance with the reference point data.

[371] Preferably, the processor is controlled by the computer program code to calculate distance data representing a distance from the reference point in accordance with the reference point data.

[372] Preferably, the processor is further controlled by the computer program code to send, via the data interface, the first posture data.
[373] Preferably, the processor is further controlled by the computer program code to calculate remedial action data representing a remedial action in accordance with the first posture data.

[374] Preferably, the sensor input data represents image data representing at least a part of the face of the wearer.

[375] Preferably, the at least a part of the face of the wearer is at least a part of an eye of the wearer.

[376] Preferably, the processor is controlled by the computer program code to calculate eye characteristic data representing an eye characteristic and calculate the vitality Indicia further in accordance with the eye characteristic.

[377] Preferably, the eye characteristic is selected from the set of eye characteristics comprising

i. redness;

ii. swelling;

iii. dark ring;

iv. Iris colour;

v. pupil symmetry; and

vi. pupil size eye characteristics.

[378] Preferably, the processor is further controlled by the computer program code to calculate the eye characteristic data in accordance with a colour recognition technique.

[379] Preferably, the processor is further controlled by the computer program code to calculate the eye characteristic data in accordance with a movement recognition technique.

[380] Preferably, the processor is further controlled by the computer program code to calculate further eye characteristic data representing a further eye characteristic and calculate the vitality indicia further in accordance with the further eye characteristic.

[381] Preferably, the processor is further controlled by the computer program code to compare the eye characteristic data against normal eye characteristic data representing a normal eye characteristic.

[332] Preferably, the eye characteristic data represents a pupil dilation state and wherein the sensor input data comprises ambient light data representing an ambient
lighting level, and wherein the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the ambient light data and the pupil dilation state.

[383] Preferably, the further eye characteristic data represents a second pupil dilation state and wherein the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the second pupil dilation state.

[384] Preferably, the sensor input data further comprises further ambient light data representing a further ambient light level, and wherein the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the further ambient light data.

[385] Preferably, the sensor input data comprises audio data representing a voice command and wherein the processor is further controlled by the computer program code to calculate, using audio recognition technique, a command in accordance with the audio data.

[386] Preferably, the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the command.

[387] Preferably, the processor is further controlled by the computer program code to receive, via the data Interface, user input Interface data representing user input using a user Interface and wherein the processor is further controlled by the computer program code to calculate prompt data representing a prompt and output, using the user Interface output, the prompt data.

[388] Preferably, the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the prompt data.

[389] Preferably, the processor is further controlled by the computer program code to calculate further prompt data representing a further prompt in accordance with the command and send, via the data Interface, the further prompt data.

[390] Preferably, the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the further prompt data.

[391] Preferably, the sensor input data comprises further audio data representing a further voice command and wherein the processor is further controlled by the computer program code to calculate, using audio recognition technique, a further command in accordance with the further audio data.
Preferably, the processor is further controlled by the computer program code to calculate the vitality indicia further in accordance with the further command.

Preferably, the processor is further controlled by the computer program code to calculate disease process data representing a disease in accordance with the vitality Indicia.

Preferably, the processor is further controlled by the computer program code to receive, via the data Interface, further sensor input data and calculate the vitality Indicia further in accordance with the further sensor input data.

Preferably, the processor is further controlled by the computer program code to select remedy data representing a remedy in accordance with the sensor Input data and the further sensor input data.

Preferably, the remedy is selected from the set of remedies comprising medication, exercise activity, diet suggestion, lifestyle suggestion, therapy suggestion and product suggestion remedies.

Preferably, the processor is further controlled by the computer program code to calculate remedy effectiveness data representing an effectiveness of the remedy in accordance with the further sensor input data.

Preferably, the processor is controlled by the computer program code to send, via the data interface, the remedy data.

Preferably, the processor is further controlled by the computer program code to send, via the data Interface, emergency data representing an emergency in accordance with the vitality indicia.

Preferably, the sensor input data represents blood oxygen saturation.

Preferably, the sensor input data represents a breathing rate.

Preferably, the sensor input data represents a heart rate.

Preferably, the sensor input data represents a temperature.

Preferably, the processor is further controlled by the computer program code to receive, via the data Interface, location data representing a location, and send, via the data Interface, the location data.

Preferably, the processor is further controlled by the computer program code to select emergency contact data further in accordance with the vitality indicia.
Preferably, the processor is further controlled by the computer program code to select a proximate application server and send, via the date interface, to the proximate application server the emergency data.

Preferably, the processor is controlled by the computer program code to send, using the date interface, medical assistance Instructions.

Preferably, the vitality indicia represents the wearer’s stress level.

Preferably, the at least one sensor is adapted to capture sensor Input data selected from the set of sensor input data comprising:

i. blood oxygen saturation;

ii. breathing rate;

iii. body temperature;

iv. heart rate data; and

v. perspiration level sensor Input data.

Preferably, the processor is controlled by the computer program code to send, via the data interface, the wearer’s stress level.

According to another aspect, there is provided an application server for detecting an environmental hazard, the application server comprising:

a processor for processing digital data;

a memory device for storing digital data including computer program code and being coupled to the processor;

a date Interface for sending and receiving data across a data network and being coupled to the processor, wherein the processor is controlled by the computer program code to:

receive, via the date Interface, sensor Input data,

detecting an environmental hazard with the sensor input data, and

send, via the date Interface, environmental hazard data representing the environmental hazard.

Preferably, the sensor input data comprises image data and wherein the processor is controlled by the computer program code to calculate the vitality indicia in accordance with an Image recognition technique and the image data.

Preferably, the processor is further controlled by the computer program code to recognise an object.
[414] Preferably, the processor is further controlled by the computer program code to calculate whether the object is hazardous.

[415] Preferably, the image recognition technique comprises text recognition technique.

[416] Preferably, the processor is further controlled by the computer program code to recognise text.

[417] Preferably, the processor is further controlled by the computer program code to calculate whether the text represents a hazardous substance.

[418] Preferably, the processor is further controlled by the computer program code, to send the text to a hazardous substance lookup service.

[419] Preferably, the sensor Input data comprises radiation level data representing a radiation level, and wherein the processor is further controlled by the computer program code to detect the environmental hazard further in accordance with the radiation level data.

[420] Preferably, the radiation measurement data represents a UV radiation measurement.

[421] Preferably, the processor is further controlled by the computer program code to calculate radiation exposure data representing radiation exposure in accordance with the radiation level data and detect the environmental hazard further in accordance with the radiation exposure data.

[422] According to another aspect, there is provided an application server for vision assistance, the application server comprising:

- a processor for processing digital data;
- a memory device for storing digital data including computer program code and

being coupled to the processor:

- a data Interface for sending and receiving data across a data network and

being coupled to the processor, wherein the processor is controlled by the computer program code to:

  receive, via the data interface, sensor Input data,

- calculate augmented image data representing an augmented image in accordance with the sensor Input data and a medical condition, and

  display, using the augmented reality display device, the augmented image.
[423] Preferably, the sensor input data comprises image data representing at least a part of the face of a wearer.

[424] Preferably, the at least a part of the face of the wearer is at least a part of an eye of the wearer.

5 [425] Preferably, the processor is further controlled by the computer program code to calculate orientation data representing an orientation of the eye in accordance with the image data and calculate the augmented image data further in accordance with the orientation data.

[426] Preferably, the processor is further controlled by the computer program code to calculate a field of view data representing a field of view of the wearer in accordance with the orientation data and calculate the augmented image data further in accordance with the field of view data.

[427] Preferably, the sensor input data further comprises image data representing forward facing image data.

10 [428] Preferably, the processor is further controlled by the computer program code to calculate view image data representing a view of the wearer and calculate the augmented image data further in accordance with the view image data.

[429] Preferably, the processor is further controlled by the computer program code to receive, via the date Interface, vision abnormality data representing a vision abnormality, and calculate the augmented image data further in accordance with the vision abnormality data.

[430] Preferably, the vision abnormality data comprises blind spot data representing a blind spot.

[431] Preferably, the processor is further controlled by the computer program code to calculate blind spot image data representing a portion of an image within the wearer's blind spot in accordance with the view image data and the blind spot data.

[432] Preferably, the augmented image data comprises a superimposition of the blind spot image data and the view image data.

[433] According to another aspect, there is provided a computer readable storage medium for calculating vitality indicia, the computer readable storage medium comprising computer code instructions for a computing device and comprising Instructions for:

receiving, from at least one sensor, the sensor input data,
calculating vitality Indicia in accordance with the sensor Input data, and
displaying, using a augmented reality displaying device, the vitality indicia.

[434] Preferably, the computer readable storage medium further comprises Instructions tor calculating the vitality indicia in accordance with at least the user
Input data.

[435] Preferably, the computer readable storage medium further comprises Instructions for calculating first body posture data representing a first body posture in accordance with the sensor input data and further comprising Instructions for calculating the vitality Indicia in accordance with the first body posture data.

[436] Preferably, the computer readable storage medium further comprises instructions for calculating second body posture data representing a second body posture in accordance with the sensor input data and further comprising Instructions for calculating the vitality Indicia further in accordance the second body posture data.

[437] Preferably, the computer readable storage medium further comprises Instructions for calculating the first posture data further in accordance with image data from an image capture device.

[438] Preferably, the image capture device is a stereoscopic image capture device and further comprising instructions for calculating the first body posture further in accordance with stereoscopic Image data from the stereoscopic image capture device.

[439] Preferably, the at least one sensor comprises an orientation sensor adapted for generating orientation data and further comprising instructions for calculating the first posture data further in accordance with the orientation data

[440] Preferably, the computer readable storage medium further comprises Instructions for calculating if the a first body posture exceeds a posture range threshold.

[441] Preferably, the posture range threshold represents a height range threshold

[442] Preferably, the posture range threshold represents an angular range threshold

[443] Preferably, the computer readable storage medium further comprises Instructions for calculating reference point data representing a reference point using the Image data and calculating the first body posture further in accordance with the reference point data.
Preferably, the computer readable storage medium further comprises instructions for receiving, via a user input device, reference point data representing a reference point and calculating the first body posture further in accordance with the reference point data.

Preferably, the computer readable storage medium further comprises instructions for calculating distance data representing a distance from the reference point in accordance with the reference point data.

Preferably, the computer readable storage medium further comprises instructions for displaying, using the augmented reality displaying device, the first posture data.

Preferably, the computer readable storage medium further comprises instructions for calculating remedial action data representing a remedial action in accordance with the first posture data.

Preferably, at least one sensor comprises a rearward facing image capture device adapted for capturing image data representing at least a part of the face of the wearer.

Preferably, the at least a part of the face of the wearer is at least a part of an eye of the wearer.

Preferably, the computer readable storage medium further comprises instructions for calculating eye characteristic data representing an eye characteristic and calculating the vitality indicia further in accordance with the eye characteristic.

Preferably, the eye characteristic is selected from the set of eye characteristics comprising

i. redness;
ii. swelling;
iii. dark ring;
iv. iris colour;
v. pupil symmetry; and
vi. pupil size eye characteristics.

Preferably, the computer readable storage medium further comprises instructions for calculating the eye characteristic data in accordance with a colour recognition technique.
Preferably, the computer readable storage medium further comprises instructions for calculating the eye characteristic data in accordance with a movement recognition technique.

Preferably, the computer readable storage medium further comprises instructions for calculating further eye characteristic data representing a further eye characteristic and calculating the vitality Indicia further in accordance with the further eye characteristic.

Preferably, the computer readable storage medium further comprises instructions for calculating further eye characteristic data representing a further eye characteristic and calculating the vitality Indicia further in accordance with the further eye characteristic.

Preferably, the computer readable storage medium further comprises instructions for calculating further eye characteristic data representing a further eye characteristic and calculating the vitality Indicia further in accordance with the further eye characteristic.

Preferably, a least one sensor comprises a ambient light meter and further comprising instructions for receiving, from the ambient light meter, ambient light data representing an ambient lighting level, and calculating the vitality Indicia further in accordance with the ambient light data and the pupil dilation state.

Preferably, the further eye characteristic data represents a pupil dilation state and wherein the at least one sensor further comprises an ambient light meter and further comprising instructions for receiving, from the ambient light meter, ambient light data representing an ambient lighting level, and calculating the vitality Indicia further in accordance with the ambient light data and the pupil dilation state.

Preferably, the further eye characteristic data represents a second pupil dilation state and further comprising Instructions for calculating the vitality indicia further in accordance with the second pupil dilation state.

Preferably, the computer readable storage medium further comprises instructions for receiving, from the ambient light meter, further ambient light data representing a further ambient light level, and calculating the vitality Indicate further in accordance with the further ambient light data.

Preferably, at least one sensor comprises an audio sensor, and further comprising instructions for receiving, from the audio sensor, audio data representing a voice command and calculating, using audio recognition technique, a command in accordance with the audio data.

Preferably, the computer readable storage medium further comprises Instructions for calculating the vitality Indicia further in accordance with the command.

Preferably, the computer readable storage medium further comprises Instructions for calculating prompt data representing a prompt and outputting, using a user interface output, the prompt data.
Preferably, the computer readable storage medium further comprises instructions for calculating the vitality Indicia further in accordance with the prompt data.

Preferably, the computer readable storage medium further comprises instructions for calculating further prompt data representing a further prompt in accordance with the command and output, using the user interface output, the further prompt data.

Preferably, the computer readable storage medium further comprises instructions for calculating the vitality Indicia further in accordance with the further prompt data.

Preferably, the computer readable storage medium further comprises instructions for receiving, from the audio sensor, further audio data representing a further voice command and calculating, using audio recognition technique, a further command in accordance with the further audio data.

Preferably, the computer readable storage medium further comprises instructions for calculating the vitality Indicia further in accordance with the further command.

Preferably, the computer readable storage medium further comprises instructions for calculating disease process data representing a disease in accordance with the vitality Indicia.

Preferably, the computer readable storage medium further comprises instructions for receiving, from the at least one sensor, further sensor input data and calculating the vitality Indicia further in accordance with the further sensor input data.

Preferably, the computer readable storage medium further comprises instructions for selecting remedy data representing a remedy in accordance with the sensor input data and the further sensor input data.

Preferably, the remedy is selected from the set of remedies comprising medication, exercise activity, diet suggestion, lifestyle suggestion, therapy suggestion and product suggestion remedies.

Preferably, the computer readable storage medium further comprises instructions for calculating remedy effectiveness data representing an effectiveness of the remedy in accordance with the further sensor input data.
Preferably, the computer readable storage medium further comprises instructions for sending, via a data interface, the remedy data.

Preferably, the computer readable storage medium further comprises instructions for sending, via a data interface, emergency data representing an emergency in accordance with the vitality indicia.

Preferably, the at least one sensor is adapted to monitor blood oxygen saturation.

Preferably, the at least one sensor is adapted to monitor a breathing rate.

Preferably, the at least one sensor is adapted to monitor a heart rate.

Preferably, the computer readable storage medium further comprises instructions for receiving, from location sensing means, location data representing a location, and send, via the data interface, the location data.

Preferably, the computer readable storage medium further comprises instructions for selecting emergency contact data further in accordance with the vitality Indicia.

Preferably, the computer readable storage medium further comprises instructions for selecting a proximate computer readable storage medium and sending, via the data Interface, to the proximate computer readable storage medium the emergency data.

Preferably, the computer readable storage medium further comprises instructions for displaying, using the augmented reality displaying device, medical assistance instructions.

Preferably, the vitality indicia represents the wearer's stress level.

Preferably, the at least one sensor is adapted to capture sensor input data selected from the set of sensor input data comprising:

i. blood oxygen saturation;

ii. breathing rate;

iii. body temperature;

iv. heart rate data; and

v. perspiration level sensor Input data.
Preferably, the computer readable storage medium further comprises instructions for displaying the wearer's stress level on the augmented reality displaying in a real-time graphical format.

According to another aspect, there is provided a computer readable storage medium for detecting an environmental hazard the computer readable storage medium comprising computer code instructions for a computing device and comprising Instructions for:

- receiving, from at least one sensor, the sensor input data,
- detecting an environmental hazard with the sensor input data, and
- displaying, using an augmented reality displaying device, the environmental hazard.

Preferably, the at least one sensor is an image capture device adapted for capturing image data, and further comprising instructions for calculating the vitality Indicia in accordance with an Image recognition technique and the image data.

Preferably, the computer readable storage medium further comprises Instructions for recognising an object.

Preferably, the computer readable storage medium further comprises Instructions for calculating whether the object is hazardous.

Preferably, the image recognition technique comprises text recognition technique.

Preferably, the computer readable storage medium further comprises Instructions for recognise text.

Preferably, the computer readable storage medium further comprises Instructions for calculating whether the text represents a hazardous substance.

Preferably, the computer readable storage medium further comprises Instructions for sending the text to a hazardous substance lookup service.

Preferably, the at least one sensor is a radiation measurement device adapted for generating radiation level data representing a radiation level, and further comprising instructions for detecting the environmental hazard further in accordance with the radiation level data.

Preferably, the radiation measurement device is a UV radiation measurement device.
[495] Preferably, the computer readable storage medium further comprises instructions for calculating radiation exposure data representing radiation exposure in accordance with the radiation level data and detecting the environmental hazard further in accordance with the radiation exposure data.

[496] According to another aspect there is provided a computer readable storage medium for vision assistance the computer readable storage medium comprising computer code Instructions for a computing device and comprising Instructions for;

- receiving, from at least one sensor, the sensor input data,
- calculating augmented image data representing an augmented image in accordance with the sensor input data and a medical condition, and
- displaying, using an augmented reality displaying device, the augmented Image.

[497] Preferably, at least one sensor comprises a rearward facing image capture device adapted for capturing Image data representing at least a part of the face of a wearer.

[498] Preferably, the at least a part of the face of the wearer is at least a part of an eye of the wearer.

[499] Preferably, the computer readable storage medium further comprises Instructions for calculating orientation data representing an orientation of the eye in accordance with the image data and calculating the augmented Image data further in accordance with the orientation data.

[500] Preferably, the computer readable storage medium further comprises Instructions for calculating a field of view data representing a field of view of the wearer in accordance with the orientation data and calculating the augmented image data further in accordance with the field of view data.

[501] Preferably, at least one sensor further comprises a forward facing image capture device.

[502] Preferably, the computer readable storage medium further comprises Instructions for receiving, from the forward facing image capture device, view image data representing a view of the wearer and calculating the augmented Image data further in accordance with the view image data.

[503] Preferably, the computer readable storage medium further comprises Instructions for receiving, from a user Interface, vision abnormality data representing
a vision abnormality, and calculating the augmented image data further in accordance with the vision abnormality data.

[504] Preferably, the vision abnormality data comprises blind spot data representing a blind spot.

5 [505] Preferably, the computer readable storage medium further comprises instructions for calculating blind spot image data representing a portion of an image within the wearer's blind spot in accordance with the view image data and the blind spot data.

10 [506] Preferably, the augmented image data comprises a super-imposition of the blind spot Image data and the view image data.

15 [507] According to another aspect, there is provided a wearable computing device for diagnosing a disease, the wearable computing device comprising a processor for processing digital data: a memory device for storing digital data including computer program code and being coupled to the processor; and at least one sensor for capturing sensor input data and being coupled to the processor, wherein the processor is controlled by the computer program code to receive, from the at least one sensor, the sensor input data, calculate, using the sensor input data, the disease in accordance with the sensor input data.

20 [508] Preferably, the disease is an eye disease.

25 [509] Preferably, the least one sensor comprises an image capture device, and wherein the processor is further controlled by the computer program code to receive, via the image capture device, image data representing an image capture of at least a portion of an eye of a wearer; and calculate the eye disease in accordance with the image data.

[510] Preferably, the at least a portion of the eye of the wearer is the sclera of the eye.

[511] Preferably, the processor is further controlled by the computer program code to calculate the eye disease in accordance with a colour recognition technique.

[512] Preferably, the eye condition is jaundice.

30 [513] Preferably, the at least a portion of the eye of the wearer is the iris of the eye.

[514] Preferably, the at least a portion of the eye of the wearer is the lens of the eye.

[515] Preferably, the eye condition is cataracts
Preferably, the disease is a skeletal defect.

Preferably, the skeletal defect is scoliosis.

Preferably, at least one sensor comprises at least one of a gyroscope and an accelerometer and wherein the processor is further controlled by the computer program code to receive, from the at least one sensor, at least one of gyroscope and accelerometer data; and calculate, using the at least one of the gyroscope and accelerometer data, the skeletal defect.

Preferably, the processor is further controlled by the computer program code to calculate a postural remedy.

Preferably, comprising an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor, wherein the processor is further controlled by the computer program code to display, using the augmented reality display device, the postural remedy.

Preferably, the disease is diabetes.

Preferably, the at least one sensor comprises a blood glucose level sensor.

Preferably, the blood glucose level sensor is an in-ear sensor.

Preferably, the disease is a neuromuscular disease.

Preferably, the neuromuscular disease is Parkinson's disease.

Preferably, the processor is further controlled by the computer program code to calculate a gait remedy.

Preferably, comprising an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor; and wherein the processor is further controlled by the computer problem code to display, using the augmented reality display device, the gait remedy.

Preferably, the gait remedy comprises virtual foot guides.

Preferably, the disease is colour blindness.

Preferably, comprising an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor; and wherein the processor is further controlled by the computer program code to display, using the augmented reality display device, a colour blindness corrected image.

Preferably, the colour blindness corrected image comprises the substitution of at least one colour with another colour.

Preferably, the at least one colour is red.
[533] Preferably, the another colour is yellow.

[534] Preferably, the processor is further controlled by the computer program code to calculate the proximity of the colour red and the colour green.

[535] Preferably, comprising an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor; display, using the augmented reality display device, the colour blindness corrected image.

[536] Preferably, comprising an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor; display, using the augmented reality display device, a colour blind test message.

[537] Preferably, comprising a user Input Interface adapted for receiving user input data, and wherein the processor is further controlled by the computer program code to receive, via the user input Interface, acknowledgement data representing an acknowledgement of the colour blind test message.

[538] Preferably, the disease is a balance disorder.

[539] Preferably, the at least one sensor comprises at least one of a gyroscope and accelerometer and wherein the processor is further controlled by the computer program code to receive, from the at least one of the gyroscope and accelerometer at least one of positional and acceleration data; and calculate an Impending Imbalance in accordance with the at least one of positional and exploration data.

[540] Preferably, the at least one sensor is adapted for location approximate and peripheral the waist of a user.

[541] Preferably, the at least one sensor is adapted for location within a belt.

[542] Preferably, comprising at least one airbag and wherein the processor is further controlled by the computer program code to deploy the at least one airbag.

[543] Preferably, the disease is a neuromuscular disease.

[544] Preferably, the neuromuscular disease is indicated by at least one of tremors and twitching.

[545] Preferably, the at least one sensor is adapted for mounting proximity the wrist of a user.

[546] Preferably, the disease is Alzheimer's.

[547] Preferably, the at least one sensor is adapted to measure the intercranial pressure of a user.
Preferably, the at least one sensor is adapted to measure the intercranial pressure of the optic nerve sheath of a user.

Preferably, the at least one sensor is adapted to employ an ultrasonic technique in measuring the intercranial pressure.

Preferably, the at least one sensor is adapted to measure the stapedial reflex of a user.

Preferably, at least one sensor is adapted to employ an Endoscopy technique.

Preferably, the at least one sensor is adapted for detecting papilledema.

Preferably, the at least one sensor is adapted to employ an electroencephalography sensor.

Preferably, the at least one sensor comprises any Infrared spectroscopy sensor.

Preferably, the disease is loss of hearing.

Preferably, comprising an audio play out device, and wherein the processor is further controlled by the computer program code to play out, using the audio player device a test audio signal.

Preferably, the test audio signal is characterised in frequency.

Preferably, the test audio signal is characterised in volume.

Preferably, comprising a user Input interface adapted for receiving user input data, and wherein the processor is further controlled by the computer program code to receive, via the user input interface, acknowledgement data representing an acknowledgement of the test audio signal.

Preferably, the disease is Intoxication.

Preferably, the at least one sensor is adapted for measuring a blood alcohol content of a user.

Preferably, at least one sensor is adapted for tissue spectrometry.

Preferably, at least one sensor is adapted for breath spectrometry.

Preferably, at least one sensor comprises a transdermal alcohol sensor.

Preferably, the disease is tooth decay.

Preferably, at least one sensor comprises an image capture device adapted for capturing image data representing at least a portion of the mouth of a user and wherein the processor is further controlled by the computer program code to calculate the disease in accordance with the image data.
[567] Preferably, comprising a data interface for sending and receiving data, the data interface being coupled to the processor, and wherein the processor is further controlled by the computer program code to send, via the data interface, alert data indicative of the disease.

5 [568] Preferably, the processor is further controlled by the computer program code to calculate a remedial medication in accordance with the disease.

[569] Preferably, the processor is further controlled by the computer program code to determine a side-effect of the remedial medication.

[570] According to another aspect, there is provided a server for diagnosing a disease, the application server device comprising a processor for processing digital data; a memory device for storing digital data including computer program code and being coupled to the processor; and a data interface for sending and receiving data across a data network, the data interface being coupled to the processor, wherein the processor is controlled by the computer program code to receive, via the data interface, sensor input data, calculate, using the sensor input data, the disease in accordance with the sensor input data.

[571] Preferably, the disease is an eye disease.

[572] Preferably, the processor is further controlled by the computer program code to receive, via the data interface, image data representing an image capture of at least a portion of an eye of a wearer; and calculate the eye disease in accordance with the image data.

[573] Preferably, the at least a portion of the eye of the wearer is the sclera of the eye.

[574] Preferably, the processor is further controlled by the computer program code to calculate the eye disease in accordance with a colour recognition technique.

[575] Preferably, the eye condition is jaundice.

[576] Preferably, the at least a portion of the eye of the wearer is the iris of the eye.

[577] Preferably, the at least a portion of the eye of the wearer is the lens of the eye.

[578] Preferably, the eye condition is cataracts

[579] Preferably, the disease is a skeletal defect.

[580] Preferably, a skeletal defect is scoliosis.
Preferably, the processor is further controlled by the computer program code to receive, from the via the data interface, at least one of gyroscope and accelerometer data; and calculate, using the at least one of the gyroscope and accelerometer data, the skeletal defect.

Preferably, the processor is further controlled by the computer program code to calculate a postural remedy.

Preferably, the processor is further controlled by the computer program code to send, via the data interface, display data for displaying using an augmented reality display device, the display data representing the colour blindness corrected image.

Preferably, the disease is diabetes.

Preferably, the sensor input data represents a blood glucose level.

Preferably, the blood glucose level is an in-ear blood glucose level.

Preferably, the disease is a neuromuscular disease.

Preferably, the neuromuscular disease is Parkinsons disease.

Preferably, the processor is further controlled by the computer program code to calculate a gait remedy.

Preferably, the processor is further controlled by the computer program code to send, via the data interface, display data for display using an augmented reality display device, the display data representing the gait remedy.

Preferably, the gait remedy comprises virtual foot guides.

Preferably, the disease is colour blindness.

Preferably, the processor is further controlled by the computer program code to send, via the data interface, display data for display using an augmented reality display device, the display data representing a colour blindness corrected image.

Preferably, the colour blindness corrected image comprises the substitution of at least one colour with another colour.

Preferably, the at least one colour is red.

Preferably, the another colour is yellow.

Preferably, the processor is further controlled by the computer program code to calculate the proximity of the colour red and the colour green.

Preferably, the processor is further controlled by the computer program code to send, via the data interface, display data for display using an augmented reality display device, the display data representing the colour blindness corrected image.
[599] Preferably, the processor is further controlled by the computer program code to send, via the data interface, display data for display using an augmented reality display device, the display data representing a colour blind test message.

[600] Preferably, the processor is further controlled by the computer program code to receive, via the data interface, acknowledgement data representing an acknowledgement of the colour blind test message.

[601] Preferably, the disease is a balance disorder.

[602] Preferably, the processor is further controlled by the computer program code to receive, via the data interface, at least one of positional and acceleration data; and calculate an Impending Imbalance in accordance with the at least one of positional and acceleration data.

[603] Preferably, the positional and acceleration data represents at least one of a position and acceleration proximate a waist of a user.

[604] Preferably, proximate a waist of a user is proximate a belt of the user.

[605] Preferably, the processor is further controlled by the computer program code to, send, via the data Interface, deployments data representing an Instruction to deploy at least one airbag.

[606] Preferably, the disease is a neuromuscular disease.

[607] Preferably, the neuromuscular disease is indicated by at least one of tremors and twitching.

[608] Preferably, the sensor Input data comprises sensor input data obtained from proximate the wrist of a user.

[609] Preferably, the disease is Alzheimer's.

[610] Preferably, the sensor Input data represents Intracranial pressure of a user.

[611] Preferably, the sensor input data represents optic nerve sheath Intracranial pressure.

[612] Preferably, the sensor Input data is obtained utilising an ultrasonic technique.

[613] Preferably, the sensor input data is a measurement of the stapedial reflex of a user.

[614] Preferably, at least sensor input data represents a fundoscopy measurement.

[615] Preferably, the sensor input data is papilledema sensor Input data.

[616] Preferably, the sensor Input data is electroencephalography sensor input data.
Preferably, the sensor input data is Infrared spectroscopy sensor Input data.

Preferably, the disease is tuss of hearing.

Preferably, the processor is further controlled by the computer program code to send, via the data Interface, audio data for play out using an audio play out device, the audio data representing test audio signal.

Preferably, the test audio signal is characterised in frequency.

Preferably, the test audio signal is characterised in volume.

Preferably, the processor is further controlled by the computer program code to receive, via the data interface, acknowledgement data representing an acknowledgement of the test audio signal.

Preferably, the disease is intoxication.

Preferably, the sensor input data is blood alcohol content sensor Input data.

Preferably, the sensor Input data is tissue spectrometry sensor input data.

Preferably, the sensor input data is breath spectrometry sensor Input data.

Preferably, the sensor Input data is transdermal alcohol sensor input data.

Preferably, the disease is tooth decay.

Preferably, the processor is further controlled by the computer program code to calculate the disease in accordance with image data.

Preferably, the processor is further controlled by the computer program code to send, via the data Interface, alert data Indicative of the disease.

Preferably, the processor is further controlled by the computer program code to calculate a remedial medication in accordance with the disease.

Preferably, the processor is further controlled by the computer program code to determine a side-effect of the remedial medication.

According to another aspect, there is provided a computer readable storage medium for diagnosing a disease, the computer readable storage medium comprising computer code Instructions for receiving sensor Input data, calculating, using the sensor Input data, the disease in accordance with the sensor Input data.

Preferably, the disease is an eye disease.

Preferably, the Instructions further comprise Instructions for receiving image data representing an image capture of at least a portion of an eye of a wearer; and calculating the eye disease in accordance with the image data.
Preferably, the at least a portion of the eye of the wearer is the sclera of the eye.

Preferably, the Instructions further comprise instructions for calculating the eye disease in accordance with a colour recognition technique.

Preferably, the eye condition is jaundice.

Preferably, the at least a portion of the eye of the wearer is the iris of the eye.

Preferably, the at least a portion of the eye of the wearer is the lens of the eye.

Preferably, the eye condition is cataracts.

Preferably, the disease is a skeletal defect.

Preferably, a skeletal defect is scoliosis.

Preferably, the Instructions further comprise instructions for receiving at least one of gyroscope and accelerometer data; and calculating, using the at least one of the gyroscope and accelerometer data, the skeletal defect.

Preferably, the instructions further comprise instructions for calculating a postural remedy.

Preferably, the instructions further comprise instructions for sending display data for displaying using an augmented reality display device, the display data representing the postural remedy.

Preferably, the disease is diabetes.

Preferably, the sensor input data represents a blood glucose level.

Preferably, the blood glucose level is an i

Preferably, the disease is a neuromuscular disease.

Preferably, the neuromuscular disease is Parkinsons disease.

Preferably, the Instructions further comprise instructions for calculating a gait remedy.

Preferably, the instructions further comprise instructions for sending display data for display using an augmented reality display device, the display data representing the gait remedy.

Preferably, the gait remedy comprises virtual foot guides.

Preferably, the disease is colour blindness.
Preferably, the instructions further comprise instructions for sending display data for display using an augmented reality display device, the display data representing a colour blindness corrected image.

Preferably, the colour blindness corrected image comprises the substitution of at least one colour with another colour.

Preferably, the at least one colour is red.

Preferably, the another colour is yellow.

Preferably, the instructions further comprise instructions for calculating the proximity of the colour red and the colour green.

Preferably, the instructions further comprise instructions for sending display data for display using an augmented reality display device, the display data representing the colour blindness corrected image.

Preferably, the instructions further comprise instructions for sending display data for display using an augmented reality display device, the display data representing a colour blind test message.

Preferably, the processor is further controlled by the computer problem code to receiving acknowledgement data representing an acknowledgement of the colour blind test message.

Preferably, the disease is a balance disorder.

Preferably, the processor is further controlled by the computer problem code to receiving at least one of positional and acceleration data; and calculating an Impending imbalance in accordance with the at least one of positional and acceleration data.

Preferably, the positional and acceleration data represents at least one of a position and acceleration proximate a waist of a user.

Preferably, proximate a waist of a user is proximate a belt of the user.

Preferably, the instructions further comprise instructions for, sending deployments data representing an instruction to deploy at least one airbag.

Preferably, the disease is a neuromuscular disease.

Preferably, the neuromuscular disease is indicated by at least one of tremors and twitching.

Preferably, the sensor input data comprises sensor input data obtained from proximate the wrist of a user.
Preferably, the disease is Alzheimer's.

Preferably, the sensor input data represents Intercranial pressure of a user.

Preferably, the sensor input data represents optic nerve sheath Intercranial pressure.

Preferably, the sensor input data is obtained utilising an ultrasonic technique.

Preferably, the sensor input data is a measurement of the stapedial reflex of a user.

Preferably, at least sensor input data represents a fundoscopy measurement.

Preferably, the sensor input data is papilledema sensor input data.

Preferably, the sensor input data is electroencephalography sensor input data.

Preferably, the sensor input data is Infrared spectroscopy sensor input data.

Preferably, the disease is loss of hearing.

Preferably, the instructions further comprise Instructions for sending audio data for play out using an audio play out device, the audio data representing test audio signal.

Preferably, the test audio signal is characterised in frequency.

Preferably, the test audio signal is characterised in volume.

Preferably, the processor is further controlled by the computer problem code to receiving acknowledgement data representing an acknowledgement of the test audio signal.

Preferably, the disease is intoxication.

Preferably, the sensor input data is blood alcohol content sensor input data.

Preferably, the sensor input data is tissue spectrometry sensor input data.

Preferably, the sensor input data is breath spectrometry sensor input data.

Preferably, the sensor input data is transdermal alcohol sensor input data.

Preferably, the disease is tooth decay.

Preferably, the Instructions further comprise Instructions for calculating the disease in accordance with image data.

Preferably, the Instructions further comprise Instructions for sending alert data Indicative of the disease.

Preferably, the instructions further comprise Instructions for calculating a remedial medication in accordance with the disease.
Preferably, the instructions further comprise instructions for determine a side-effect of the remedial medication.

It should be noted that the computer readable storage medium and application server provide the same or similar advantages as those enumerated above in respect of the mobile computing device.

According to one aspect is provided a mobile computing device for detecting a user anxiety disorder, the mobile computing device comprising a processor for processing digital data; a memory device for storing digital data including computer program code and being coupled to the processor: a sensor for capturing environment input data and being coupled to the processor, wherein the processor is controlled by the computer program code to receive, from the sensor, the environment input data, calculate the occurrence of the anxiety disorder in accordance with the environment input data.

Advantageously, the mobile computing device is adapted to automate the detection of one or more anxiety disorders, such that the anxiety order may be treated. Such automated detection remove the need for specialised healthcare professionals making treatment is available at lower cost to more sufferers.

Preferably, the environment input data comprises image data.

Advantageously, the mobile computing device is operable to recognise various scenes, scenarios objects and the like within the uses surrounds for the purposes of detecting the occurrence of the anxiety disorder.

Preferably, in calculating the occurrence of the anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with an image recognition technique.

Preferably the image recognition technique is adapted for recognising an object.

Preferably the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

Advantageously, the mobile computing device is adapted to compare scenes at different points in time for the purposes of recognising repetition anxiety disorders.

Preferably the image data comprises video data.

Preferably the environmental input data comprises audio data.
Advantageously, the mobile computing device may be adapted for analysing other aspects of the uses environment such as by recognising events using audio data. In this manner, the mobile computing device may be adapted for use in sound in diagnosing certain anxiety disorders, such as obsessive counting or antisocial behaviour such as swearing, shouting and the like.

Preferably, in calculating the occurrence of anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with an audio recognition technique.

Preferably the audio recognition technique is adapted for recognising a sound.

Preferably the environmental input data comprises acceleration data.

Advantageously, the mobile computing device is adapted for detecting motion and therefore for detecting certain anxiety disorders characterised by the motion of the individual, such as excessive washing, repetition and the like.

Preferably, in calculating the occurrence of anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with a movement recognition technique.

Preferably the movement recognition technique comprises recognising a movement

Preferably the mobile computing device further comprises an Interface for outputting information, and wherein the processor is further controlled by the computer program code to output indication data representing an indication of the occurrence of the anxiety disorder.

Advantageously, the mobile computing device is operable to provide feedback to the user such that the user may take corrective action.

Preferably the Interface comprises a haptic interface.

Preferably the haptic Interface is adapted to vibrate.

Preferably, the interface comprises a data interface for sending data across a data network, and wherein the processor is further controlled by the computer program code to send the indication data via the data Interface.

Preferably, the interface comprises a display device, and wherein the processor is further controlled by the computer program code to display the indication data using the display device.

Preferably, the display device comprises an augmented reality display device.
[721] Preferably, the processor is further controlled by the computer program code to display the indication of the occurrence of the anxiety disorder in augmented reality.

[722] Preferably, the processor is further controlled by the computer program code to display instructions for addressing the anxiety disorder.

[723] Advantageously, the mobile computing device may be adapted to not only detect and anxiety disorder but also provide the means for remedying the disorder.

[724] Preferably, the mobile computing device comprises a wearable portion.

[725] Preferably, the mobile computing device comprises a headset.

[726] Preferably, the sensor is located at the headset.

[727] According to another aspect, there is provided an application server for detecting a user anxiety disorder, the application server comprising a processor for processing digital data: a memory device for storing digital data including computer program code and being coupled to the processor; a network interface for sending and receiving data across a data network and being coupled to the processor, wherein the processor is controlled by the computer program code to receive, via the network interface, the environment input data, calculate the occurrence of the anxiety disorder in accordance with the environment input data.

[728] Preferably, the environment input data comprises image data.

[729] Preferably, in calculating the occurrence of the anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with an image recognition technique.

[730] Preferably, the image recognition technique is adapted for recognising an object.

[731] Preferably, the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first image data and the second image data.

[732] Preferably, the image data comprises video data.

[733] Preferably the environmental input data comprises audio data.

[734] Preferably, in calculating the occurrence of anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with an audio recognition technique.

[736] Preferably the audio recognition technique is adapted for recognising a sound.
[736] Preferably the environmental input data comprises acceleration data.
[737] Preferably, in calculating the occurrence of anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with a movement recognition technique.
[738] Preferably the movement recognition technique comprises recognising a movement.
[739] Preferably the processor is further controlled by the computer program code to send, via the network interface, an indication of the occurrence of the anxiety disorder.
[740] Preferably, the indication data is adapted for display by a display device.
[741] Preferably, the display device comprises an augmented reality display device.
[742] Preferably, the indication data further comprises instructions for addressing the anxiety disorder.
[743] Preferably, the indication data is adapted for use by a haptic interface.
[744] Preferably, the haptic interface is adapted to vibrate.
[745] According to another aspect, there is provided a computer readable storage medium for detecting a user anxiety disorder, the computer readable storage medium having computer program code instructions recorded thereon, the computer program code instructions being executable by a computer and comprising instructions for receiving, via a network interface, the environmental input data, instructions for calculating the occurrence of the anxiety disorder in accordance with the environmental input data.
[746] Preferably, the environmental input data comprises image data.
[747] Preferably, the computer readable storage medium further comprises instructions for calculating the occurrence of the anxiety disorder in accordance with an image recognition technique.
[748] Preferably, the image recognition technique is adapted for recognising an object.
[749] Preferably, the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first image data and the second image data.
[750] Preferably, the image data comprises video data.
[751] Preferably, the environmental input data comprises audio data.
Preferably, the computer readable storage medium further comprises instructions for calculating the occurrence of the anxiety disorder in accordance with an audio recognition technique.

Preferably, the audio recognition technique is adapted for recognising a sound.

Preferably, the environmental input data comprises acceleration data.

Preferably, the computer readable storage medium further comprises instructions for calculating the occurrence of the anxiety disorder in accordance with a movement recognition technique.

Preferably, the movement recognition technique comprises recognising a movement

Preferably, the computer readable storage medium further comprises instructions for sending, via the network Interface, an indication of the occurrence of the anxiety disorder.

Preferably, the indication data is adapted for display by a display device.

Preferably, the display device comprises an augmented reality display device.

Preferably, the indication data further comprises instructions for addressing the anxiety disorder.

Preferably, the indication data is adapted for use by a haptic Interface.

Preferably, the haptic Interface is adapted to vibrate.

According to another aspect of there is provided a system for detecting a user anxiety disorder the system comprising a wearable device; and an application server; wherein the application server is adapted to receive from the wearable device environment input data, and the application server is adapted to calculate the occurrence of the anxiety disorder in accordance with the environment Input data.

Preferably, the environment Input data comprises image data.

Preferably, in calculating the occurrence of the anxiety disorder, the application server is adapted to calculate the occurrence of the anxiety disorder in accordance with an image recognition technique.

Preferably, the Image recognition technique is adapted for recognising an object.
[767] Preferably, the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

[768] Preferably, the image data comprises video data.

[769] Preferably, the environmental input data comprises audio data.

[770] Preferably, in calculating the occurrence of anxiety disorder, the application server is adapted to calculate the occurrence of the anxiety disorder in accordance with an audio recognition technique.

[771] Preferably, the audio recognition technique is adapted for recognising a sound.

[772] Preferably, the audio recognition technique is adapted for receiving first audio data at a first time and second audio data at a second later time, and comparing the first audio data and the second audio data.

[773] Preferably, the environmental input data comprises acceleration data.

[774] Preferably, in calculating the occurrence of anxiety disorder, the application server is adapted to calculate the occurrence of the anxiety disorder in accordance with a movement recognition technique.

[775] Preferably, the movement recognition technique comprises recognising a movement.

[776] Preferably, the movement recognition technique is adapted for receiving first movement data at a first time and second movement data at a second later time, and comparing the first movement data and the second movement data.

[777] Preferably, the application server further comprises a data Interface for outputting information, and upon the occurrence of the anxiety disorder, the application server is adapted to output, via the data interface, Indication data representing an Indication of the occurrence of the anxiety disorder to the wearable device; and wherein the wearable device comprises a device output Interface for outputting information to the user.

[778] Preferably, the device output Interface comprises a haptic Interface.

[779] Preferably, the haptic Interface is adapted to vibrate.

[780] Preferably, the device output Interface is a display device, and wherein the wearable device is adapted to display the Indication data using the display device.

[781] Preferably, the display device comprises an augmented reality display device.
[782] Preferably, the wearable device is adapted to display the indication of the occurrence of the anxiety disorder in augmented reality.

[783] Preferably, the wearable device is adapted to display instructions for addressing the anxiety disorder.

[784] Preferably, the wearable device comprises a headset.

[785] Preferably, the sensor is located at the headset.

[786] Preferably, the device output Interface is an audio interface, and wherein the wearable device is adapted to play out the indication data using the audio Interface.

[787] Other aspects of the Invention are also disclosed.

[788] Brief Description of the Drawings

[789] Notwithstanding any other forms which may fall within the scope of the present invention, a preferred embodiments of the Invention will now be described, by way of example only, with reference to the accompanying drawings in which:

[790] Fig. 1 shows a mobile computing device on which the various embodiments described herein may be implemented in accordance with an embodiment of the present invention;

[791] Fig. 2 shows a network of computing devices on which the various embodiments described herein may be implemented in accordance with an embodiment of the present Invention;

[792] Fig. 3A shows an exemplary wearable mobile computing device taking the form of a headset in accordance with a preferred embodiment of the present invention;

[793] Fig. 3B shows an exemplary wearable mobile computing device taking the form of a headset in accordance with a preferred embodiment of the present Invention.

[794] Fig. 4 shows an embodiment of the mobile computing device 100 on which the various embodiments described herein may be implemented in accordance with an embodiment of the present invention;

[795] Fig. 5 shows a user wearing a mobile computing device adapted to project markers on the users surroundings to define reference points, and a construction of a computer-generated model of the user in accordance with an embodiment of the present Invention;
Fig. 6 shows a graphical means of displaying the actions performed by a user of the mobile computing device in accordance with an embodiment of the present invention;

Fig. 7 shows a graphical means of displaying stress vitality of the user of the mobile computing device, as well as possible shape and colour variations of this graph in accordance with an embodiment of the present invention;

Fig. 8 shows an overhead view of the first user of the mobile computing device lying down after a heart attack, as observed by a second user of the mobile computing device, and display means that may be used for the second user in accordance with an embodiment of the present Invention;

Fig. 9 shows a feedback system that uses user input data and environmental Input data to diagnose a health condition in accordance with an embodiment of the present invention;

Fig. 19 shows the field of view as observed by the user of the mobile computing device suffering from a blind spot, and possible display means to include the obstructed field of view in accordance with an embodiment of the present Invention; and

Fig. 10 shows various types of blind spots of the user of the mobile computing device, and an example of how a complete field of view can be displayed in accordance with an embodiment of the present invention.

Detailed Description of Specific Embodiments

It should be noted in the following description that like or the same reference numerals in different embodiments denote the same or similar features.

Mobile computing device

Fig. 1 shows a mobile computing device 100 on which the various embodiments described herein may be implemented, in particular the steps of detecting vitality Indicia may be implemented as computer program code instructions executable by the mobile computing device 100.

As will become apparent from the disclosure herein, the mobile computing device 100 is adapted for use by users, carers and the like in calculating various vitality Indica. The vitality Indica may comprise any Indica of general well-being, health, lifestyle and the like and may include Indica relating to uses state of sleep,
food consumption, exposure to environmental hazards, disease symptoms and the like. For example, a user may use the mobile computing device 100 for continually monitoring one or more vitality Indica. For example, the mobile computing device 100 may be adapted to continually measure whether the user has had enough sleep and alert the user when the user is in a state of sleep deprivation. Alternatively, the mobile computing device 100 may be adapted to measure one or more vital signs of the user, such as temperature, blood pressure, heart rate, blood sugar levels and the like in the early detection of disease onset.

[807] The mobile computing device 100 may also be used by carers, such as doctors, nurses and the like in the care of patients. For example, a doctor or nurse may use the mobile computing device 100 to provide one or more vitality indica relating to a patient.

[808] In a preferred embodiment, the mobile computing device 100 is a wearable mobile computing device, such as, for example, the glasses 100b as substantially shown in figure 3. In its further embodiments, the mobile computing device 100 may comprise constituent parts, where for example, the mobile computing device 100 comprises a headset coupled to a computing device, such as a computing device located in the user's pocket or located in a remote location, wherein the constituent parts cooperate for the purpose of detecting vitality Indica in the manner described herein.

[809] In a yet further preferred embodiment, the mobile computing device 100 is adapted for providing augmented reality information. For example, referring to the preferred embodiments shown in figure 3, there is shown an augmented reality overlay 310 displayed by the mobile computing device 100 showing various vitality Indica 305.

[810] As will become apparent from the disclosure herein, the mobile computing device 100 is adapted for calculating a vitality indicia, such that remedial steps may be taken where the vitality indicia represents an unhealthy state. Such remedial steps may comprise alerting the user, providing instructions to the user, or alerting the third person so as to be able to assist the user.

[811] The computer program code Instructions may be divided into one or more computer program code Instruction libraries, such as dynamic link libraries (DLL), wherein each of the libraries performs a one or more steps of the method.
Additionally, a subset of the one or more of the libraries may perform graphical user interface tasks relating to the steps of the method.

[812] The device 100 comprises semiconductor memory 110 comprising volatile memory such as random access memory (RAM) or read only memory (ROM). The memory 100 may comprise either RAM or ROM or a combination of RAM and ROM.

[813] The device 100 comprises a computer program code storage medium reader 130 for reading the computer program code Instructions from computer program code storage media 120. The storage media 120 may be optical media such as CD-ROM disks, magnetic media such as floppy disks and tape cassettes or flash media such as USB memory sticks.

[814] The device 100 further comprises I/O interface 140 for communicating with one or more peripheral devices. The I/O interface 140 may offer both serial and parallel interface connectivity. For example, the I/O interface 140 may comprise a Small Computer System interface (SCSI), Universal Serial Bus (USB) or similar I/O Interface for Interfacing with the storage medium reader 130. The I/O interface 140 may also communicate with one or more human Input devices (HID) 160 such as keyboards, pointing devices, joysticks and the like. The I/O Interface 140 may also comprise a computer to computer Interface, such as a Recommended Standard 332 (RS-232) Interface, for Interfacing the device 100 with one or more personal computer (PC) devices 190. The I/O Interface 140 may also comprise an audio Interface for communicate audio signals to one or more audio devices 1050, such as a speaker or a buzzer.

[815] The device 100 also comprises a network interface 170 for communicating with one or more computer networks 180. The network 180 may be a wired network, such as a wired Ethernet™ network or a wireless network, such as a Bluetooth™ network or IEEE 802.11 network. The network 180 may be a local area network (LAN), such as a home or office computer network, or a wide area network (WAN), such as the Internet or private WAN.

[816] The device 100 comprises an arithmetic logic unit or processor 1000 for performing the computer program code Instructions. The processor 1000 may be a reduced instruction set computer (RISC) or complex Instruction set computer (CISC) processor or the like. The device 100 further comprises a storage device 1030, such as a magnetic disk hard drive or a solid state disk drive.
Computer program code instructions may be loaded into the storage device 1030 from the storage media 120 using the storage medium reader 130 or from the network 180 using network interface 170. During the bootstrap phase, an operating system and one or more software applications are loaded from the storage device 1030 into the memory 110. During the fetch-decode-execute cycle, the processor 1000 fetches computer program code instructions from memory 110, decodes the instructions into machine code, executes the instructions and stores one or more Intermediate results in memory 100.

In this manner, the Instructions stored in the memory 110, when retrieved and executed by the processor 1000, may configure the mobile computing device 100 as a special-purpose machine that may perform the functions described herein.

The device 100 also comprises a video Interface 1010 for sending and receiving video signals to a display device 1020, such as a liquid crystal display (LCD), cathode-ray tube (CRT) or similar display device. In a preferred embodiment the display device 1020 is an augmented reality display device as substantially shown in figure 3. In this manner, the device 100 is adapted to display information to the user in augmented reality.

The device 100 further comprises an environment sensor 105. The environment sensor 105 is adapted for receiving environment input from which the vitality Indicia may be calculated.

In one embodiment, the environment sensor 106 is adapted to detect infrared radiation so as to be able to ascertain the surface temperature of a patient so as to, for example, alert a doctor as to a fever state of the patient.

In another embodiment, the environment sensor 105 is adapted to detect sound, so as to, for example be able to detect repetitive coughing of the user for the purposes of detecting the onset of flu, or, in another example, sound levels for the purposes of warning the user of potentially damaging sound levels.

In a yet further embodiment, the environment sensor 105 may be adapted for capturing image or video data, so as to allow for image or video recognition technique to be employed for detecting certain events or scenarios. For example, the environment sensor 105 may be adapted for monitoring a user's eyelids, so as to determine when the user is in a level of awareness or tiredness and wherein the user is in an awakened state. In this manner, the mobile computing device 100 may be
adapted for monitoring the level of awareness or tiredness of the user. In further examples, the image or video data from the environment sensor 105 may be employed in the detection of other aspects, such as determining the nutritional composition from a plate of food (e.g., protein, hydrates and fats) using image data, or calculating patient compliance with the treatment regime, such as by using video data for the purposes of detecting whenever a patient takes the tablets prescribed by a doctor.

[824] In its further embodiments, the environment sensor 105 may be adapted for measuring acceleration, so as to be able to detect the motion and orientation of the user. For example, the motion detected by the environment sensor 105 may be adapted for calculating a fitness vitality indicia, wherein the environment sensor 105 is adapted for detecting when the user is jogging, walking, working at a much and the like. Furthermore, for example the orientation of the user may be used in the detection of the resting state of the user, wherein the horizontal position usually indicates that the user is in the resting state.

[825] In a further embodiment, the environment sensor 105 may be adapted for measuring other vital signs of the user, such as heart rate, blood pressure, blood sugar levels and the like all of which may be employed in, for example, the detection of a disease process such as diabetes.

[826] In another embodiment, the environment sensor 105 may be adapted for measuring environment hazards, such as UV light levels, radiation, toxic chemicals and the like. In this manner, the mobile computing device 100 may be adapted for alerting the user to an Incident environmental hazard (e.g., whether user is in an atmosphere comprising high levels of carbon monoxide) or punitive environment or hazards, such as prolonged UV or other radiation exposure levels.

[827] The environment sensor 105 may be adapted for measuring further environmental Inputs depending on the application.

[828] In certain embodiments, the environment sensor 105 may be proximate with the computing device 100. For example, where the computing device 100 takes the embodiment of an augmented reality headset 100b as substantially shown in figure 3, the environment sensor 105 may be integrated within the housing of the augmented reality headset 100b, such as by being a miniaturised accelerometer or the like located within a temple of the headset 110b. However, it should be noted
that in other embodiments, the remote sensor 105 may be located away from the computing device 100 adapted to communicate with the computing device by suitable wired or wireless transmission means. Preferably, wireless transmission means such as Bluetooth is preferred from an ergonomic perspective.

In one embodiment such a remotely located environment sensor 105 may take the form of a wristband, comprising one or more of the above-mentioned senses. Advantageously, the wristband being so located approximate to the rest of the user is ideally suited for measuring pulse rate and other vitality indica of the user. Furthermore, by the wristband comprising an accelerometer, the computing device 100 is able to monitor the hand movements of the user which may be used for receiving instructions from the user, or for diagnostic purposes.

Specifically, for diagnostic purposes, the computing device 100 utilising accelerometer data from the wristband, maybe adapted to detect tremors which may be an indication of Parkinson’s disease or other neuromuscular disease.

In yet further embodiments, the environment sensor 100 may be adapted specifically for detecting Alzheimer’s disease. Specifically, Alzheimer’s disease can be detected up to 10 years in advance by detecting loss in brain matter. Specifically, during the loss of brain matter, there is an increase in cerebral spinal fluid (CSF) which is generally indicated by increased intracranial pressure (not a similar for the symptoms of hydrocephalus). As such, the environment sensor 100 may be adapted to measure intracranial pressure of the user utilising a noncontact sensing technique such as ultrasound measurements of the optic nerve sheath of the user. Alternatively, the computing device 100 may be adapted to measure the stapedial reflex (such as in the ear) or alternatively take the form of a rear facing camera to conduct fundoscopy (otherwise known as ophthalmology) to visualise papilledema.

In other embodiments, the environment sensor 105 may additionally or alternatively comprise sensors for measuring brain activity such as by conducting electroencephalography wherein external electrodes placed on the scalp of the user to measure changes and electrical activity. Alternatively, near infrared spectroscopy (NIRS) could measure blood oxygen levels in the brain to provide an indirect diagnostic measurement.

It should be appreciated, that the environment sensor 105 may be adapted for measuring a combination of environment inputs. For example, where the mobile
computing device 100 is adapted for use by a doctor in the care of the patient, the
environment sensor 105 may be adapted for measuring the Infrared radiation from
the patient's to measure the temperature of the patient (e.g., for the purposes of
detecting a fever state of the patient) and also any audio emanating from the patient,
(e.g. such as audio data emanating from a stethoscope interface for the purposes of
detecting and obstructed airway) wherein the environment Indicia may then be
employed by the mobile computing device 100 and combined fashion. For example,
the mobile computing device 100 may be adapted for detecting flu by the
combination of a high temperature and an indication of obstructed airway.

[833] The device 100 also comprises a communication bus subsystem 150 for
interconnecting the various devices described above. The bus subsystem 150 may
offer parallel connectivity such as Industry Standard Architecture (ISA), conventional
Peripheral Component Interconnect (PCI) and the like or serial connectivity such as
PCI Express (PCIe), Serial Advanced Technology Attachment (Serial ATA) and the
like.

[834] System

[835] Fig. 2 shows an exemplary system 200 of computing devices 100 on which
the various embodiments described herein may be implemented. Such a system 200
may be employed, where, for example remote data processing is required for the
purposes of detecting the vitality indicia.

[836] As is evident from the figure 2, the system 200 comprises an application
server 210 in communication with one or more mobile computing devices 100 across
a data network 180. In this manner, the mobile computing devices 100 operable to
send environment Input data to the application server 210 and receive from the
application server 210 data representing the vitality indicia. Such an arrangement is
especially advantageous wherein, for example, processor Intensive computing
technique such as image recognition and the like are employed. In this manner, the
Intensive computing may be offloaded to the application server 210 blowing for
mobile computing devices 100 with less processing power to be employed.

[837] In one embodiment, a "dumb" or "thin" wearable device may be used as an
little or no processing power instead of the mobile computing device 100. In this
manner, the user wears the wearable device, and the wearable device comprises
one or more sensors as described herein. In this embodiment, Instead of the device
performing any processing of the environmental input data, the environmental input
data is forwarded to the application server 210 for processing by the application server 210.

[838] Defecting vitality indicia - carer based embodiments

[839] Exemplary embodiments will now be described in which the mobile computing
device 100 is adapted for use by a user in measuring and tracking one or more vitality Indicia.

[840] In a first embodiment, the mobile computing device 100 is adapted for
detecting when the user has a fever. In this manner, the mobile computing device
100 is adapted for measuring the temperature of the user. As the mobile computing
device is adapted as a wearable device in a preferred embodiment, the mobile
computing device 100 may be adapted to measure the temperature of the user by
skin contact. For example given the embodiment shown in figure 3, wherein the
mobile computing device 100 takes the form of a wearable headset, the environment
sensor 105 may take the form of a thermometer 315 located at the head
engagements of the wearable device 100b. In other embodiments, the thermometer
315 may be located at the locations of the wearable device 100b. For example, the
thermometer 315 may be located at the nose engagement portion, forehead
engagement portion, temple adjacent portion or ear adjacent or insertion portion of
the wearable device 100b. In this manner, the mobile computing device 100 may
measure the temperature of the wearer from the wearer's head and alert the user
when the wearer's temperature exceeds a threshold.

[841] It should be noted in certain embodiments, that's where the mobile computing
device 100 is adapted for use by a user, the mobile computing device may be
adapted to send vitality Indicia data across a data network 180 to an application
server 210. In this manner, a carer, such as a doctor treating the user, may be
alerted to the vitality Indicia of the user. For example, where the user is exhibiting
high temperatures, the doctor may be alerted to the user is a temperature and be
able to phone the user to question the user as to the user's condition.

[842] It should also be noted that in certain embodiments, the environment sensor
105 may be a remote unit, such as a remote unit attached to the user skin, adapted
to send measurements data to the mobile computing device 100 via Interfaces
including a wired interface, or wireless interfaces such as a Bluetooth wireless interface.

[843] The mobile computing device 100 may be adapted to measure temperature in other manners, such as via infrared and the like.

[844] In a further embodiment the mobile computing device 100 may be adapted for detecting coughing, and the like. In one manner, the environment sensor 105 may comprise an audio interface, adapted for receiving audio data. In this manner, the mobile computing device 100 may detect a cough when the audio data indicates a sound above a certain decibel threshold. Alternatively, the mobile computing device 100 may be adapted to employ an audio recognition technique to adapt to recognise a cough sound. In other manners, the environment sensor 105 may comprise an accelerometer, so as to for example detect acceleration wherein the user coughs. In a yet further manner, the environment sensor 105 may comprise a video interface, such as a rear facing video interface to adapt to capture video data from the user's face, in this manner, the mobile computing device 100 may be adapted for employing a video recognition technique adapted to detect a cough from the user's facial expression.

[845] It should be noted that other symptoms may be detected other than coughing, such as sneezing, yawning, hiccuping and the like.

[846] In another embodiment the mobile computing device 100 may be adapted for the purposes of monitoring the sleep requirements of the user. For example, the mobile computing device 100 may be adapted to measure the user's sleep periods, and indicates to the user whether the user's sleep periods comprise sufficient sleep time. Referring to the exemplary embodiments given in figure 3, the augmented display 310 comprises a vitality indicia 305f representing the user's level of awareness or tiredness. The mobile computing device 100 may be further adapted to calculate a category into which their users vitality indicia falls. In the example given, the mobile computing device 100 displays to the user that the user level of awareness or tiredness is critical on account of having received too little sleep with in a previous period. The amount of sleep may be shown in the augmented display 310 by a bar chart, wherein the full extent of the bar chart represents sufficient sleep. Again, there are a number of members in which the mobile computing device 100 may be adapted to measure the level of awareness or tiredness of the user. For
example, the environment sensor 105 may be a rear facing video capture device for monitoring the user's eyes to detect when the user's eyelids are shut. Alternatively, the environment sensor 105 may comprise an orientation sensor for detecting when the user is lying down.

In a further embodiment, the mobile computing device 100 is adapted for employing image and video recognition technique for the purposes of ascertaining the vitality indicia. In one manner, the mobile computing device 100 may be adapted for measuring the nutritional intake of the user. In this manner, the environment sensor 105 may comprise a forward facing video camera such that when the user is eating, the environment sensor 105 is adapted to capture image or video data of the user's plate. Image or video recognition technique may then be employed for the purposes of ascertaining the nutritional composition of the plate of food. The mobile computing device 100 may be adapted for recognising the food composition of the food in various manners, such as by colour, shape and the like. In an alternative example, the mobile computing device 100 may be adapted to ascertain nutritional Information from food packaging wherein the user may scan each item of food packaging prior to consumption for recordal by the mobile computing device 100. The nutritional composition of the food packaging may be recorded by the mobile computing device 100 using image recognition technique (e.g. so as to read the nutritional Information displayed on the packaging) or using barcode recognition technique (e.g. wherein the mobile computing device 100 is adapted to look up nutritional information from the application server 210 in accordance with a barcode data). Referring to the embodiment given in figure 3, there are shown a vitality indicia representing the nutritional intake of the user. In the example given, the mobile computing device 100 is categorised the nutritional intake of the user as being okay wherein, in the example given, and okay categorisation represents that the nutritional Intake of the user comprises the daily recommended allowance of protein, carbohydrates and fat.

The image or video recognition technique may be employed in other manners such as by recognising certain situations or events. For example, the video or image recognition technique may be employed to measure compliance, so as to, for example detect each time a user takes a tablets as prescribed by a doctor so as to be able to report on treatment regime compliance. In another example, the image or
video recognition technique may be employed to detect symptoms of the user. For example, where the environment sensor 105 is a rearward facing video camera, the mobile computing device 100 may be adapted to detect and eye infection on the basis of the colour of the eye, or a measles, on the basis of a rash pattern across the user's face, for example.

[849] As alluded to above, the environment sensor 105 may be adapted to measure the environment input parameters. For example, the environment sensor 105 may be adapted to measure the exposure to UV light during a certain period. In this manner, the mobile computing device 100 may inform the user when the user has received too much UV light. Alternatively, the mobile computing device 100 may inform the user when the user has not received enough sunlight. In this exemplary embodiment, the environment sensor 105 comprises a UV sensor. Referring to the exemplary embodiments given in figure 3, the augmented display 310 comprises an ultraviolet light vitality indicia 305 representing to the user the amount of UV light to which the user has been exposed. In the example given, the mobile computing device 100 is categorised the UV exposure as being low.

[850] The environment sensor 105, as alluded to above, may be further adapted to measure other vital signs, such as blood pressure, sugar levels, heart rate and the like. In this manner, where for example the user is diabetic, the mobile computing device 100 may be adapted to detect a fall in blood sugar of the user and warn the user to take appropriate remedial action in time.

[851] Detecting vitality indicia – user based embodiments

[852] Exemplary embodiments will now be given in which the mobile computing device 100 is adapted to assist carers, such as doctors and the like in treatment of a patient. In these exemplary embodiments, the mobile computing device 100 may be adapted to be worn by the patient so as to gather vitality indicia data about the patient, such that the vitality indicia data may be reported to the doctor, such as by being stored by the mobile computing device 100 for download at the doctors practice, or communicate to the doctor via the application server 210.

[353] Alternatively, the mobile computing device 100 may be worn by the doctor wherein the mobile computing device 100 provides augmented Information as to one or more vitality indicia of the patient. In this manner, the mobile computing device
100 may facilitate the diagnosis of diseases and the like and reduce professional
error in the care of patients.

[854] As exemplary embodiments in which the mobile computing device 100 may
be worn by the patient is described above, the exemplary embodiments in which the
mobile computing device 100 is adapted to be warned by the doctor will now be
described.

[855] In a preferred embodiment the mobile computing device 100 takes the form
of the glasses 100b is shown substantially in figure 3 for use by the doctor during a
patient consultation so as to provide augmented vitality Indicia Information to the
doctor about the patient during the consultation.

[856] In the exemplary embodiment, given in figure 3, the mobile computing device
100 is adapted for assisting the doctor in the diagnosis of flu and therefore is
adapted to measure three vitality Indicia being, the airway condition of the user as
Indicated by Indicia 305a, the temperature of the user is Indicated by Indicia 305b
and the user's compliance with a treatment regime as indicated by indicia 305c.

Each of these Indicia will now be discussed in turn.

[857] Referring to the airways Indicia 305a, the indicia represents the breathing
capabilities of the patient, whether they be obstructed, or clear. In ascertaining the
airways Indicia 305a the environment sensor 105 may comprise a stethoscope
Interface for obtaining audio data from a stethoscope measurement of the patient. In
this manner, the environment sensor 105 comprises an audio interface, and the
mobile computing device 100 may be adapted to employ an audio recognition
technique in detecting obstructed airways, which may be characterised by a rasping
sound (e.g. an audio Spectrum having high frequency band components). In the
example given in figure 3, the environment sensor 105 has detected the occurrence
of an obstructed airways, and has therefore characterised the airway state of the
user has been obstructed.

[858] Furthermore, the mobile computing device 100 may be adapted to measure
the temperature of the patient. As opposed to the contact which measurement
described above. In this embodiment, it is preferable that the mobile computing
device 100 measure the temperature of the patient at a distance, such as by using
Infrared, for example. In this manner, the environment sensor 105 is adapted to
measure the infrared radiation radiating from the patient and calculate the surface
temperature of the patient. In this manner a high temperature of a patient may be
determined without contact with the patient. Referring to the embodiment given in
figure 3, the environment sensor 105 has detected that the patient has a high
temperature and has therefore characterised the patient as having a fever.

[859] Furthermore, the mobile computing device 100 may be adapted to measure
the patient's compliance with a treatment regime. In this manner, the patient may
have worn the mobile computing device 100 for a period of time wherein the mobile
computing device 100 was adapted to measure the patient's compliance with a
treatment regime, such as, for example, the taking of flu medication at a patient at
required intervals. Referring to the embodiment given in figure 3, the mobile
computing device 100 displays a compliance Indicia 305c of lower compliance.

[860] As such, the mobile computing device 100 may be adapted to use a
combination of vital Indicia in the diagnosis process. For example, using the example
above, the augmented display 310 comprises a calculator to diagnosis 320
representing that the patient potentially has flu. In reaching this diagnosis, the mobile
computing device 100 has ascertained that the patient has obstructed airways, has a
high temperature, and has failed to take flu medication.

[861] It should be noted that each of the vital Indicia described with reference to this
each may be used for the purposes of forming the diagnosis. However, in a
preferred embodiment, the mobile computing device 100 is adapted to use a
combination of vitality indica or at least a minimum threshold of vital Indicia e.g. such
as two of the three vital Indicia) in forming the diagnosis. In one embodiment, the
mobile computing device 100 is adapted to use a weighted measure of the vitality
Indica in forming the diagnosis. For example, where a patient is suffering from flu, a
high temperature may be more indicative of the presence of flu as opposed to
sneezing symptoms, for example.

[862] In the example given in figure 3, the vitality Indicia 306 are represented in
graphical format. However, it should be appreciated that the vitality Indicia 305 may
be displayed in any manner, graphical or otherwise. Furthermore information derived
from the vitality Indicia 305 may further be calculated by the mobile computing device
100 for display. For example, Indicia such as mental health, emotional health,
fitness, strength, tiredness and the like may all be derived from the vitality Indicia
measurements obtained from the environment sensor 105.
In one embodiment, the mobile computing device 100 or application server 210 may be adapted to employ artificial intelligence computational technique for the purposes of forming the diagnosis. Many forms of artificial intelligence type may be used depending on the circumstance but may comprise adaptive artificial intelligence technique such as learner or breeder algorithms, fuzzy logic algorithms and the like.

In one embodiment, the mobile computing device 100 or application server 210 may be adapted to calculate a remedy for any diagnosis. For example, where the mobile computing device 100 or application server 210 diagnosis a person with flu, the mobile computing device or application server 210 may consult a database for potential treatment, such as the appropriate cough medicine, vitamin supplements or the like. In one embodiment, the wearable device 100b may be adapted to display advertising’s relating to any diagnosis. For example, where a user is suffering from flu, the wearable device 100b may be adapted to display an advertisement for a particular brand of cough syrup. Note that in making a recommendation of a medication, the wearable device 100b may be adapted to ascertain the potential side-effects of the recommended medication. For example, wherein the computing device 100 recommends a cough syrup, the computing device 100 may be configured with potential side-effects, or alternatively request such potential side-effects via the network interface 170 so as to be able to alert the user accordingly. As such, the user will be able to make a determination not to take a particular cost syrup which may cause drowsiness if the user is about to drive a vehicle. Similarly, the computing device 100 is adapted to monitor the dosage regime of a particular medicine, so as to warn or that the user should the user exceeds the commended dosage regime, fail to take medicine as prescribed or the like.

In one embodiment, the mobile computing device 100 may be adapted for the effective management of diabetes in monitoring blood glucose levels of the user. Specifically, in this embodiment, the mobile computing device 100 may comprise a blood glucose measurement device (not shown) adapted to periodically measure the blood glucose levels of the user. In one embodiment, the user may be required to submit to periodic pinpricks to provide blood samples for the computing device 100, such as by way of disposable swab or the like. In other embodiments, the computing device 100 may be operably coupled to a non-invasive blood glucose measuring device, such as an in ear measurement device or the like.
In this manner, the mobile computing device is able to monitor the blood glucose levels of the user and take appropriate action should the glucose levels tend towards dangerously low levels. For example, the mobile computing device 100 may be adapted for displaying, using the display device 1020 to the user, and warning indication to the user to take and Insulin shot for example, alternatively, the computing device 100 may be adapted to send a warning message across the network 180 to an appropriate carer, should the insulin levels drop below dangerously low levels.

In one embodiment the computing device 100 may be adapted to protect dangerously low Insulin levels so as to prevent the user from reaching a diabetic state. In one manner, the computing device 100 may be adapted to monitor the trajectory of the blood glucose levels so as to estimate time to the time for the user reaches dangerously low a diabetic state. In this manner, the computing device 100 may be adapted to Implement a graded the management process, wherein should the computing device 100 calculates that the user is a one hour away from a diabetic state, the computing device 100 may display, using the display device 1020 a warning, warning the user to take and insulin shot. Should the blood glucose levels thereafter continued towards a diabetic state, such as if the user falls to take appropriate remedial action to control their blood glucose levels, then the computing device 100 may be adapted to communicate, via the network Interface 170 a warning message to an appropriate carer so as to seek external assistance for the user. The data sent via the network Interface 170 may comprise the location of the user so as to assist in the location of the user.

In one embodiment, the computing device 100 may be adapted to interface with dangerous machinery so as to prevent the operation of such dangerous machinery wherein the user is in a diabetic state. For example, should the computing device 100 to take that the user is in a diabetic state (which diabetic state may be confirmed by the computing device 100 by prompting the user for a response, for which no responses received) the computing device 100 may be adapted to cut power to, for example a motor vehicle of the user.

Wellbeing Indicator

Figure 4 shows a mobile computing device 401 on which the various embodiments described herein may be Implemented. In particular the steps of
detecting vitality Indicia may be implemented as computer program code Instructions executable by the mobile computing device 401.

[870] The device 401 is an embodiment of the mobile computing device 100, which comprises a headset 400, on which is mounted a sensor array 410, further comprising an orientation sensor 410a, stereoscopic Image capture sensor 410b, audio sensor 410c, image capture sensor 410d, location sensor 410e, breathing rate sensor 410f, blood oxygen saturation sensor 410g, heart rate sensor 410h, temperature sensor 410i, and perspiration sensor 410j. The headset 400 also comprises a display means 415 for displaying the vitality Indicia, further comprising graphical display 415a, number/Index display 415b, Image/video display 415c, and speaker 415d for audio output. Vitality Indicia may be displayed on a lens 1020 of the headset 400. The headset 400 can communicate wirelessly to an external bus subsystem 470, which in turn connects together a processor 420, storage media 440, and an I/O data interface 450. The processor 420, storage media 440, and an I/O data interface 450 are contained within a unit 480. The I/O data interface can communicate wirelessly to an external network database 460. The processor 420 further comprises a computer program code 430 stored in RAM or other memory means that the processor 420 controls.

[871] In another embodiment, the unit 480 may be connected directly to, or form part of, the headset frame of the wearable device 400. In this embodiment the unit 480 is compact and its components fit on or within the headset 400. The components within the unit 480 may be spread across the headset 400 to ensure uniformity and to evenly distribute the weight so that wearing of the headset 400 is more comfortable for the user. Communication between the sensor array 410, the lens display 1020, and the unit 480 may be through direct electrical wire connection. In this way, the processor 420 may process the environmental Input data more efficiently and minimise any lag or delay with communicating the data between the components.

[872] The computer program code 430 has the capacity to determine the overall health and wellbeing of the user by comparing the environmental input data from the sensor array 410 with reference data from a population or past user data stored in the storage media 440. Further, the computer program code 430 may comprise an algorithm that can specifically diagnose a health condition if certain values are
beyond the normal healthy range, or if predetermined targets are met that are indicative of a health condition. Preferably, it can also determine a remedy for the detected health condition. For example, the remedy may be listed on a look-up table corresponding to a given health condition, and the processor 420 can access the look-up table to find the possible remedies for a given health condition. Further, the remedy may be a medication, exercise activity, diet suggestion, lifestyle suggestion, therapy suggestion or product suggestion. If the remedy requires a product purchase the network database 460 may be accessed to locate the desired product.

[873] Preferably, the orientation sensor 410a may be at least one gyroscope adapted to monitor environmental input data comprising the head movements and neck flexion of the user. The gyroscope may be able to distinguish between sudden and gradual motions such as swaying and twitching. In one embodiment, a medication consumed by the user may have resulted in fatigue, which may be characterised by gradual leaning of the head when the user is seated. The user may be prompted of this motion so corrective action can be taken.

[874] Preferably, the stereoscopic image capture sensor 410b may be at least two Image capture sensors 410d in the form of cameras. These cameras may be adapted to monitor environmental input data comprising the external environment surrounding the device 100. The two images taken from the stereoscopic image capture sensor 410b may be offset when combined, but are then processed by the processor 420 to calculate three-dimensional depth to determine accurate distances between objects or features. Sensor Input data may be derived from the actions performed by the user, the physiological features of the user, or the objects perceived in the field of view of the user.

[875] In one embodiment, the image capture sensor 410d is provided as a rearward facing camera for the purposes of monitoring dental health of the user. In this manner, the camera is adapted to capture Imagery of the user's teeth within the field of view of the camera so as to make a determination as to potential buildup of plaque, bacteria or the like.

[876] Preferably, the audio sensor 410e may be at least one microphone adapted to monitor environmental Input data comprising noise produced by the user. For instance, coughing, sneezing, runny nose and the like may occur. By monitoring such data diagnosis or approximate diagnosis can be formed or the effectiveness of
a suggested remedy can be monitored, and so the computer program code 430 can cause the processor to calculate a further remedy suggestion and log data. The vitality indici may also be communicated using a speaker. Alternatively, the audio sensor 410c may detect coughing, sneezing, runny nose and the like from the user as audio data. The audio data may be compared against reference audio data indicative of a health condition, such as a cold or flu, and the user may be prompted that they have the cold, flu, or other health condition. Further, the processor 420 may determine an appropriate remedy or action to alleviate or cure the health condition.

Preferably, the image capture sensor 410d may be at least one outwards-facing camera adapted to monitor environmental input data comprising captured images or recorded video of the user's physiological features. In one embodiment if the user feels an irritation on their skin, the processor 420 may prompt the user to look at the area of interest while wearing the headset 400 so that the camera 410d can retrieve data on the skin colour and contours. Alternatively, the image capture sensor 410d may be a rearwards-facing camera adapted to look directly at the user's facial features to detect swelling eyelids, teary eyes and the like. Skin disorders such as measles may be detected using rearwards-facing cameras, analysing rash patterns on the user's face.

Preferably, the location sensor 410e may be at least one GPS tracking device adapted to monitor environmental input data comprising the geographic location of the user. The I/O data interface 450 can communicate location data between the processor 420 and the network database 460 to determine in real-time the user's location. In one embodiment, it may be used to assist the processor 420 to locate stores or pharmacies that have the suggested products the user was recommended to take. Alternatively, it can assist the user to be located if the user prompts for emergency assistance.

Note that in one embodiment, the location sensor 410e is adapted for use by the computing device 100 for being a navigational aid for the user, so as to provide visual or auditory directions to the user. In a yet further embodiment, the computing device 100 may utilise a complement of the image capture sensor 410d and the location sensor 410e to provide navigational assistance for the visually impaired. Specifically, utilising the image capture sensor 410d in conjunction with a suitable object or image recognition technique, the computing device 100 may be adapted to
Identify obstacles in the path of the user so as to guide the user appropriately. It should be noted that in certain embodiments, the computing device 100 need not necessarily utilise an image capture device for the purposes of identifying obstacles, but may alternatively utilise ultrasonic proximity measurement devices or the like. In this manner, utilising the location sensor 410e, the computing device 100 is able to provide directions to the user, and alert them to potential obstacles with in their path.

In a yet further embodiment, the computing device 100 may be adapted for face recognition for the purposes of assisting the visually impaired person (or even a non-visually Impaired person) in recognising other people. For example, the computing device 100 may be adapted to recognise a person, and play out the persons name to be used, either visually or by sound.

[880] In another embodiment, the network database 460 may comprise data on the weather conditions, pollen count, humidity and the like as weather data. The processor 420 can use the weather data to determine the weather conditions of the user’s location in an automated manner. Further, the processor 420 can determine if the weather data will adversely affect the user. For instance, a high pollen count in the area may cause an allergic reaction if the user at the time is suffering from hay fever, and so the user is prompted that the area may exacerbate their health condition and so should seek remedial action.

[881] Preferably, the breathing rate sensor 410f may be at least one acoustic transducer adapted to monitor environmental Input data comprising the regular inhalation/exhalation cycles of the user by monitoring the sounds these cycles produce. Alternatively, the breathing rate sensor may be at least one radar sensor adapted to detect minute movements below the surface of the skin. The radar may send very short pulses towards the chest and detect the echo reflected. The regular pulsating rhythm could be converted to breathing rate, and be sensitive enough to determine changes over time. The effectiveness of medications pertaining to nasal congestion could be tracked over time to assess user vitality.

[882] Alternatively, breathing rate can be detected by at least one accelerometer. The accelerometer is put into contact with the user’s body, preferably on or near their chest. Breathing causes a periodical movement of the chest wall and thus accelerates the accelerometer. In the rest state, the accelerometer measures the acceleration at a first time as frequency data, and the periodical change in frequency
data at a second time may be converted to an equivalent breathing rate. A series of accelerometers may be used to determine breathing rate at different positions/orientations with respect to the user to account for the effects of gravity.

[883] Preferably, the blood oxygen saturation sensor 410g may be at least one pulse oximeter adapted to monitor environmental input data comprising oxygen count in the user's blood, whereby light of two different wavelengths is passed through the user to a photodetector. The changing absorbance at each of the wavelengths would be measured, allowing the processor 420 to determine the absorbance due to the pulsing arterial blood. In this way, the processor 420 can determine if the user is experiencing inadequate ventilation, and hence suggest a remedy to increase intake of oxygen.

[884] Preferably, the heart rate sensor 410h may be at least one heart rate monitor adapted to monitor environmental input data comprising the user's heart beat frequency, whereby it detects the electrical signal produced by the beating heart through the skin. This monitor may be used to determine if a medication has caused the user to have an elevated heart rate, and the user can be prompted of this. Alternatively, the heart rate sensor 410h may comprise a radar sensor adapted to measure the arterial movements just below the surface of the skin. This may then be converted to an equivalent blood pressure of the user.

[885] Alternatively, the heart rate sensor 410h may be at least one accelerometer. The accelerometer is put into contact with the user's body, preferably close to their heart. The heart beat would cause a periodical movement of the chest wall and thus changing the acceleration of the accelerometer. In the rest state, the accelerometer measures the acceleration at a first time as frequency data, and the periodical change in frequency data at a second time may be converted to an equivalent heart rate. A series of accelerometers may be used to determine heart rate at different positions/orientations with respect to the user to account for the complex three-dimensional movements and deformations of the heart.

[886] Preferably, the temperature sensor 410i may be at least one thermometer adapted to monitor environmental input data comprising the temperature of the user's skin surface. In one embodiment, it may be used to assess the treatment of a person experiencing flu or is recovering from an exercise conducted.
[887] Preferably, the perspiration sensor 410 may be at least one pH sensor adapted to monitor environmental Input data comprising the sodium content in the perspiration of the user. This sensor may change colour depending on the detected sodium content, and the image capture sensor 410 can analyse the colour. The processor 420 can then determine the perspiration output proportional to the sodium content.

[888] The sensor array 410 may comprise many other sensors that can be mounted at the headset frame of the wearable device 400. Preferably, the sensor array 410 is compact and the sensors fit on or within the headset 400. The sensors may be spread across the headset 400 at specific locations to optimise their effectiveness. The sensor array 410 can remain active without the user being aware of its function, and can collect environmental Input data in an automated manner. The environmental Input data can be ideally detected by at least one of the sensors in the sensor array 410. Further, the environmental Input data can be derived from the physiological features of the user. These physiological features may include body temperature, sweat output, pulse derived from heartbeat, sounds and the like.

[889] The unit 480 can be a smartphone or other mobile device in communication with the headset 400. Communication can be via an Internet connection, Bluetooth, radio signal, or wire cables directly connecting the headset 400 to the unit 480. The I/O data interface 450 allows the user to communicate with the device 401, which may be in the form of manual input of Information or speaking of commands to the I/O data Interface 450. The unit 480 may be capable of analysing the function of the headset 400 and the sensor array 410, and determine if any component in the system 401 is faulty or defective. The user may be alerted via the I/O data Interface 450 or the headset 400 of the fault.

[890] The storage media 440 is capable of storing Information about the physiological features of the user, such as the healthy range of values for the users heart rate, body temperature and the like. It can also store Input data derived from at least one of the sensors in the sensor array 410 in an automated manner, as well as input data from the I/O data interface 450 and from the network database 460. The data stored in the storage media can be retrieved by the user, carer or doctor via the I/O data Interface 450 or the network database 460.
The network database 460 can comprise user health information from a doctor's database, statistical health information, as well as product databases of pharmaceutical manufacturers of health products. The network database 460 can be updated in an automated manner so that it contains the most up-to-date information about user health and products available. These products may be categorised according to what ailment it can treat, price range, location, availability and the like.

The vitality indicia may be in the form of text or readily comprehensible graph, numbers, audible speech and the like. The vitality Indicia can be displayed over the lens 1020 of the headset 100b, and be displayed when the user requests it or when a health condition is detected.

In one embodiment, the device 401 may be adapted to diagnose a health condition affecting the user of the device 401, and calculate a remedy for the given diagnosis. For example, the user may have an elevated temperature, which may be detected by a temperature sensor 4101. The user may also have an elevated heart rate, which can be detected by the heart rate sensor 410h. The user may also have an abnormal breathing rate, which can be detected by the breathing rate sensor 410r. The input data from these sensors may be transferred to the processor 420, and the computer program code may determine that elevations in these data from the reference healthy state is, for example, indicative of flu. So, the processor 420 may consult the network database 460 for potential treatment. An appropriate cough medicine, vitamin supplement or the like may be suggested. Once the product is consumed, the processor 420 may be prompted by the user that the product has been taken. The processor 420 may continue to analyse the vitality of the user via the sensor array 410, and determine the progress of the treatment. Further recommendations may be given depending on the outcomes of the preceding treatments.

In one embodiment, the wearable device 400 may be adapted to display advertising relating to a diagnosis. For example, where a user is suffering from flu, the wearable device 400 may be adapted to display an advertisement for a particular brand of cough syrup. The advertisement may be in the form of an image or pre-recorded video designed by the manufacturer or company that owns the product. The user may be able to send feedback on the advertised product to the network database 460 as to whether the product was successful in treating the users
condition or feedback data can be generated *automatically* by the processor as a function of sensor data received post *implementation* of a remedy and this feedback data may be fed back automatically to the storage media 440 or network database 460. So, in *future*, the processor 420 can determine whether or not to recommend that product again according to the feedback data. Product advertisements can be selectively chosen by the processor 420 based on the user's experience with a product.

[895] In another embodiment, the detected health condition of the user may be tiredness or fatigue, which may not be treated by medication. Instead, the processor 420 may give a diet suggestion, such as recommending consumption of more fruits and vegetables, less fatty food intake and the like. The processor 420 may also recommend the user conduct an exercise activity such as, but not limited to, walking, jogging, riding a bike, push-ups, or visit a *gym* remedies. The user's vitality would be tracked in an automated manner over time to assess if there was an improvement to their vitality. Relevant parties such as pharmaceutical manufacturers, carers and doctors may have access to the network database 460. In particular, a carer or doctor may be able to track the progress of the user's vitality, and be able to give a diagnosis for an underlying, possibly more severe, health condition which would otherwise have gone undiagnosed.

[896] In another embodiment, the remedy may be a prescription or instruction given by the doctor or carer that the user should follow. For instance, a doctor may prescribe that the user take tablet medications at regular intervals over a few days. The image capture sensor 410b may analyse Instances where it recognises the user holding the tablet, and log this data in the storage media 440. At least one of the sensors in the sensor array 410 may be able to detect physiological changes each time the tablet is ingested, and the I/O data Interface 450 may report on treatment regime compliance. This report can be accessed by a doctor or carer to monitor user compliance.

[897] In another embodiment, the network database 460 may further comprise data in relation to a collection of users of the device 401. Including data pertaining to their health conditions, when the condition was first encountered, which demographics or populations were affected at the time, the locations of these Incidents, and which remedies proved most successful in treating the conditions. The processor 420 may
use this data and compare it against the input data of the current user of the device 100 to adapt the remedy suggestion so that it is more suitable. In this way, the remedies suggested are tailored to the user's specific needs. The suggestion may be based on the user's cultural background, age, gender, lifestyle and the like. Further, product suggestions may be selected based on these aforementioned factors.

[898] In another embodiment, the user may lead a sedentary lifestyle or have a poor diet, which at least one of the sensors in the sensor array 410 detects. So, when the user eventually has an illness the feedback data can be generated automatically by the processor as a function of sensor data received post Implementation of a remedy and then feedback choice of remedy may be affected by the lifestyle and diet input data. Exercise and dietary supplement consumption may be some suggested options for people in this demographic.

[899] UV Index Monitor

[900] In a further embodiment, at least one of the sensors in the sensor array 410 can be used to determine a user's exposure to ultraviolet (UV) radiation. In one embodiment, the image capture sensor 410d may be further adapted to detect light intensity or brightness of the surrounding environment. Further, it may also be able to detect light of shorter wavelengths within the visible light spectrum, and the processor 420 may calculate that there is a possible elevation of UV radiation. Also, the temperature sensor 410j may detect the current ambient temperature of the environment the user is situated. If it is higher than the expected beat levels then the processor 420 may calculate that there is a possible elevation of UV radiation. These Indicia may then be displayed on the headset 400 showing the current and predicted radiation levels for the day, and whether the user has exceeded or not yet reached their recommended exposure to sunlight. The processor 420 may give a remedy or suggestion that the user moves outdoors to increase their UV exposure, or to seek shelter if the exposure limit has been reached.

[901] Emergency System

[902] The processor 420 may be further adapted to recognise an emergency or hazard to the health of the user if certain criteria are met. The processor 420 is also capable of triggering an emergency data broadcast from the I/O data interface 450 to the network database 460, hospital or ambulance in close proximity, or another user of the device 401. This broadcast will prompt the doctor, carer, or other user that the
person must be attended to. For instance, the sensors in the sensor array 410 may be adapted for measuring vital signs of the user such as heart rate, blood pressure, breathing rate, body temperature, blood oxygen saturation and the like. The processor 420 may be adapted to detect an emergency situation based upon significant deviations of vital signs from the normal range.

[903] In a further embodiment, the processor 420 may be adapted to send the emergency data to concerned parties which may include emergency health contact, relevant health professionals, family members and the like, so they may be notified as to the health status of the wearer. The user vitality data can be stored in the storage media 440 or network database 460 to be accessed by the person's treating the user at the time to better deduce what the condition is and what Indications were present prior to the emergency. For instance, the data may indicate that a heart attack was preceded by gradual Increases in heart rate over the last five minutes, as well as possible difficulties in breathing over the past hour.

[904] In a further embodiment, the emergency data may also include global positioning data corresponding to the location of the wearer via the location sensor 410. For example, if the user experienced a heart attack, the emergency data may comprise both the vitality Indicia and user location, and broadcast to the relevant emergency service. In this way, the user can be easily located and remedial action taken sooner.

[905] In a further embodiment, the emergency data may be sent to a second geographically-proximal user of the mobile computing device 100. Additionally, the emergency data may be retrieved from the storage media 440 or network database 460, and may comprise medical assistance Instructions which the second user of the mobile computing device 100 must perform. For instance, the emergency medical procedure may be cardiopulmonary resuscitation (CPR). The second user of the mobile computing device 100 may be prompted by their device to perform a certain sequence of chest compressions and artificial respiration techniques on a person undergoing cardiac arrest.

[906] Figure 8 shows an image recognition technique applied to the first wearer 810 of the mobile computing device 100 that experienced a heart attack. Medical assistance instructions may be sent from the device 100 of the first wearer 810 to the second wearer of the mobile computing device 100. This may comprise an overlay of
the necessary positioning procedures on the anatomy of the first wearer 810. For example, the image recognition technique may be adapted to identify the position on the chest 820 of the first wearer 810 on which the second person is to perform chest compressions. The second user is then prompted by their device 100 to adopt the required hand position. A prompt 830 may give written or verbal instructions as to what action to perform, for instance: "Apply 10 counts of compressions."

[907] Stress Biofeedback

[908] In one embodiment, the processor 400 can be adapted to monitor the users stress level, resulting from emotional anxiety or exercise. Using at least one of the aforementioned sensors that comprise the sensor array 410, stress may be indicated through a combination of the following inputs: heart rate, blood pressure, body temperature, blood oxygen saturation, breathing rate, perspiration level and the like. The user may be alerted of their stress vitality indicia graphically, numerically, verbally or by any other suitable means.

[909] In another embodiment, the stress vitality of the user may be that they are angry, which may have been calculated from a detected elevation in heart rate and perspiration. The output may comprise a pre-recorded voice from a speaker, saying "It appears that you are stressed. Perhaps you will benefit from a quick break," as verbal means of conveying vitality. Further, the output may also comprise a favourite song that is played as part of the remedial action.

[910] In another embodiment, a numerical display of vitality indicia may be a score, for instance between 1 and 10, to correlate with the detected stress levels of the user. The user may be prompted that their score is 8, and then suggest remedial actions. The sensors in the sensor array 410 will subsequently monitor the vitality of the user and adjust the score accordingly. Advantageously, this method prompts the user to actively seek remedial action to change their vitality indicia, and to possibly allow the user to pre-empt external influences that could elevate the score in the future.

[911] In a further embodiment, stress level of the wearer over time may be shown in the form of a bar graph figure 7 as part of the augmented display 310 that actively assists in the treatment of the user's stress disorders. The vitality indicia 700 may comprise a scale of emotion 720a which, for example, indicates the user is happy via an emoticon 710a, but as a result of detected stress or anxiety the scale will change
to correlate with the detected stress. For example, when the user’s stress level is calculated to be too high, the graph 700 may alter its characteristic such as colour of the bar 720b, type of emoticon symbols 710b or the like. In this way, the user’s attention is drawn to the elevated stress level, and so may be compelled to actively seek remedial action to change their vitality indicia 720b.

[S12] Label Identifier for Allergens/Hazards

[913] In another embodiment, the image capture sensor 410d may be adapted for detecting environment hazards, in particular, hazards posed by a consumable product that the user may be unaware of. The image capture sensor 410d can analyse the text printed on a given product, for instance the ingredients listed on a food product. The computer program code 430 can be adapted to use a text recognition technique for the purposes of identifying text containing a hazardous substance. For example, an object containing a label with text that says "May contain traces of nuts" may be detected by the computer program code 430. The storage media 440 may have this phrase marked as a hazard to the user if the user has a peanut allergy. A user-defined list of allergies, hazards and undesired products may be inputted into the storage media 440 for future reference for the user.

[914] In another embodiment, a product may not contain an ingredients list that is readable. So, the image capture sensor 410d may instead take images of the product name and manufacturer label. Then, the processor 420 may communicate with the network database 460 to access a hazardous lookup service of the manufacturer or knowledgeable third party, and look up the ingredients list to determine if the product poses a health hazard to the user. If so, then the user is prompted of the hazard.

[S15] Eye Disorders

[916] In one embodiment, the image capture sensor 410d may be a rearwards-facing camera further adapted to take images or video of the eyes of the user. In particular, eye characteristics such as redness, swelling, dark ring, iris colour, pupil symmetry, and pupil size eye characteristics may be analysed using the image capture sensor 410d. The processor 420 may use an image recognition technique to recognise certain eye characteristics and changes to these eye characteristics over time. Further, the image recognition technique may comprise colour recognition, light intensity, and movement techniques to further calculate eye characteristics.
[91 7] It should be noted that in other embodiments, other visual characteristics indicative of eye disorders over and above those mentioned above may be detected by the computing device. For example, the computing device 100 may be adapted to discern the sclera colour of the user which may be indicative of jaundice.

Furthermore, the computing device 100 may be adapted for recognising iris pattern and lens colour, which may become clouded for those users suffering from cataracts. [918] Upon detecting and eye disorder, there are a number of remedial steps that the computing device 100 may be adapted for undertaking.

[919] In a first manner, the computing device 100 may be adapted to notify the user of such an eye disorder. For example, the computing device 100 may be adapted to display, using the display device 1020 an indication to the user that the user may be suffering from cataracts and that the computing device 100 recommend is that the user visits an eye specialist to have their cataracts removed. The computing device 100 may utilise a network interface 170 for the purposes of selecting an appropriate eye specialist from an eye specialist database, which selection may comprise a consideration of the specialist skills of those specialists within the database, proximity to the user and the like.

[920] In a second manner, the computing device 100 may be adapted to calculate an appropriate remedy for the user. For example, upon determining that the user is suffering from jaundice, the computing device 100 may be adapted to recommend to the user 100 an appropriate remedy, which may comprise a dietary change or visit to a doctor in the case may be. in selecting the appropriate remedy for the user, the computing device 100 may be able to access a remedy database (not shown) via a network interface 170 for the purposes of selecting an appropriate remedy. In a further extension to this embodiment, the program on the may be reviewed by a health professional wherein the computing device 100 provides images of the eye of the user for review by a health professional. The health professional then reviews the eye imagery, makes appropriate recommendations and comments and submits these appropriate recommendations and comments back to the computing device 100.

[921] In a certain manner, the computing device 100 may be adapted to alert health care professionals. For example, the computing device 100 may gather information relating to an eye condition of the user for review by the user is general practitioner
at their annual checkup. In such a checkup, the health practitioner may retreat from
the medical records of the user 100 the imagery and other data collected which may
be indicative of such eye disorders for the patient so as to make an informed
decision.

[922] At a first instance, the sensor 410d may analyse the eye characteristics of the
user and store this data as reference data. A computer-generated model of the eye
can be generated by the processor 420, which can be retrieved by the user, doctor
or carer. At a second instance, the sensor 410d may analyse further eye
characteristics, generate a model of the eye, and compare it against the first model.
The computer program code 430 may then analyse the differences between the
models to determine the severity of the changes, and display this data as user vitality
180.

[923] In a further embodiment, the computer-generated model of the user's eye
may comprise data pertaining to distances between the eyelids, diameters of the
pupil and iris, curvature of the cornea, angles at the corners of the eye, colour
variations, and the presence of blood vessels in the sclera. Changes to the
aforementioned data are updated in an automated manner to monitor the changes
over time. For example, the processor 420 may assign invisible markers or reference
points on the user's eyes. The image capture sensor 410d will track the movements
of these markers, similar to the methods employed in motion capture, and the
computer-generated model will be adapted accordingly. The computer-generated
model would be compared against a reference model to assist in determining if there
is significant deviation from a healthy eye. The image capture sensor 410d may have
a high resolution to allow the processor 420 to count and measure the proliferation of
blood vessels in the sclera when redness is detected.

[924] In one embodiment, the sensor 410d may be employed to detect eye infection
and its progression on the basis of increasing redness of the eye, as well as
inflammation of the surrounding skin. The processor can track the rate of
progression and actual size changes over time in an automated manner.
Alternatively, these changes may not be noticeable by the user but still detectable by
the sensors, and these changes can be reviewed by the user, doctor or carer to
assist in a diagnosis of the condition.
[925] In another embodiment, the image capture sensor 410d may be further adapted to derive ambient light meter to generate ambient light intensity data from the external environment. The light intensity data may be used in conjunction with the eye characteristics data to further generate a diagnosis of the eye disorder. For example, the size of the pupil may be monitored in conjunction with the ambient light intensity to determine whether the pupil is responding adequately to changes in ambient light. The pupil may exhibit a pupil dilation state that has changed from the reference values of light intensity. Based on the correlation between these two factors, the processor 420 can calculate the nature of the condition, and suggest remedial action in accordance with diagnosis data. The remedy action may be to avert the user’s gaze from intense light sources, seek shelter, or let the eyes rest. Alternatively, if the lens 1020 is of adjustable transparency, controllable by the processor 420, the remedy action could be to darken the lens to filter out the bright light from reaching the user’s eyes.

[926] In another embodiment, the redness of the user’s eyes may be detected, which may be indicative of conjunctivitis, episcleritis, keratitis and the like. For example, the user may experience strained coughing, leading to a bright red, uniformly dense bloody area on the sclera. The processor 420 may prompt the user that they have subconjunctival haemorrhage, and suggest remedial action thereafter. Further, this medical condition may appear alarming, but is fairly common and of little significance. So, the user may be prompted to rest and allow the eyes to recover on their own. However, the degree of redness does not necessarily correlate to a specific medical condition, and so diagnosis will be affected by the other changes to the eye characteristics of the user.

[S27] **User-Prompted Medical Diagnosis**

[928] In one embodiment, the computing device 100 is adapted for detecting loss of hearing of the user. Specifically, the computing device 100 may be adapted to play out suitable audio signal from time to time, while prompting the user to acknowledge hearing the sound. In this manner, the computing device 100 may be adapted to perform sound tone and sound level tests from time to time. For example, the user may be instructed when receiving the computing device 100 to acknowledge and audio signal from time to time. Such acknowledgements may be by spoken word, gesture or the like. In this manner, from time to time, the computing device 100 will
play out a test signal to test the users acknowledgement. For those sounds played out which are not acknowledged, the computing device 100 may be able to calculate those tones which the user cannot hear, and those sound levels beneath the users hearing threshold.

[929] Blood alcohol concentration

[930] In one embodiment, the computing device 100 is adapted for measuring the blood alcohol concentration of the user. Such an embodiment would be advantageous for our safety, especially in alerting the driver as to unsafe blood alcohol levels, or in the disabling of motor vehicles while under the influence, for example.

[931] In this moment the environment sensor 105 is adapted to calculate the blood local concentrations of the user. In a first manner, the environment sensor 105 is adapted for tissue spectrometry wherein a near infrared light is utilised to detect alcohol in the present system. As such measurements required skin contact, the environment sensor 105 is preferably a wrist mounted sensor 105. However in other embodiments, the computing device 100 may be adapted to meet into contact with the user such as where the computing device 100 takes the embodiment of the augmented reality headset 100b as substantially shown in figure 3, the computing device 100 may make measurements from environment sensor 106 be mounted on the stem of the headset 100b so as to make contact behind the ear of the user.

[932] In another manner, the computing device 100 is adapted to employ breath spectrometry, a technique requiring a skin contact. Such a measurement technique may be employed by the augmented reality headset 100b comprising an infrared measuring environment sensor 105 is located substantially at the nose of the headset 100b so as to make measurements of the user is exhaled breath. In this manner, the computing device 100 is adapted to "sniff" the exhaled breath of the user.

[933] In other embodiments, other in environment sensors 105 may be employed for the purposes of measuring blood alcohol concentration. These Include a chance to articles sensor, or blometric fingerprint type device.

[934] User-Prompted Medical Diagnosis

[935] Advantageously, the mobile computing device 100 can analyse changes to user vitality over time in an automated manner. However, if there is a condition that
the device 100 could not detect but the user expresses concerns over what they see as a condition, the device 401 can be employed to give a diagnosis. This process is shown in figure 9. If the user suspects a medical condition they can actively control the sensor array 410 to focus on the affected area. For example, if the user spots an abnormal patch on the surface of their skin, the user can input this data 910 to the processor 420. The sensor array 410 may also target the patch, and the data sent to the processor 420. The processor 420 may then give an output data 950, which may prompt the user questions 920 based on the first data these sensors retrieve. This prompt data may be in the form of a question or Instruction to prompt the user to provide further Information. For example, the mobile computing device may display the words: "Do you have a headache?" The user could then respond to this user Interface output by inputting audio data "Yes" or "No" as further prompt data sent to the processor 420 to calculate further prompt data. An audio recognition technique can recognise between the commands and prompts given by the user, and adapt their calculations based on their response. Then, the device will ask for further Information, such as: "How long have you had this headache for?" The user will then respond accordingly, and the process is repeated until the device is able to narrow down a list of possible health conditions 940.

[936] **Vision Assistance**

[937] The device 401 can be further adapted to improve the field of vision of the user with vision Impairments, which could include any Impairment where a blind spot blocks out a portion of the user's field of view, shown in figure 11. In particular, the device 401 may assist users that have blind spots which completely cover half of the field of vision 1110, such as in Homonymous Hemianopia. It may also assist those where blind spots cover the peripheral of the field of vision 1120, such as in tunnel vision. It may also assist in some cases when blind spots 1140 cover a general area of the field of vision 1130, such as with diabetic retinotherapy. The device 401 may assist users of other visual impairments such as Peripheral Scotoma, Glaucoma, and Macular Degeneration.

[938] The image capture sensor 410a may be at least one rearwards-facing camera to detect the eye movements of the user, and in particular the processor 420 further calculates how the users eyes are orientated and what their field of vision is at the time. For example, at a first time the user may be prompted by the processor 420 to
took directly forwards or focus their sight on an object in front of them to determine sight calibration data. This data may comprise the positions of the centroid of the pupils, and further used to calculate the line of sight or gaze direction of the user. The processor 420 can combine the sight calibration data to define the observed field of view. Further the processor 420 can detect instances when the user cannot move their pupils when prompted to look at a given direction to determine obstructed sight calibration data. This data is used to define the obstructed field of view, and the processor 420 may prompt outwards-facing cameras to capture images or video of the external environment as image data. Then, either a portion or whole of the Image data would be displayed on the lens 1020 but still within the user’s observed field of view, depending on the user’s preferred method of display.

[939] In one embodiment, the processor 420 may detect that the user’s gaze is focused more to their right, which may be Indicative of a blind spot on the left side of their vision 1002. Outwards-facing cameras may be able to record the user’s surroundings in real-time, and the display 1020 may project the vision blocked by their blind spot in at least one of the following methods, and is also displayed as figure 10:

[940] i. One method utilises the image capture sensor 410α to generate an image of the surroundings and compress it into the portion of vision that the patient can see 1003.

[941] ii. One method utilises the image capture sensor 410α to generate a partial image of the surroundings that is blocked by the blind spot. A smaller image of the field of view the user cannot see is displayed in a section of the user’s view 1004.

[942] In another embodiment, the device 401 can adapt its methods of vision assistance for conditions where the blind spots differ in terms of location, size and shape obstructing the field of view from off the user. In this case, the user may be able to define manually the field of view that is obstructed, and the method by which the missing field is displayed on the lens 1020. A doctor may also be able to modify the displays for conditions where the blind spots are specific.

[943] In a further embodiment, the user can specify what portion of the field of view is obstructed by the blind spot via the I/O data Interface 450. In an embodiment where the I/O data Interface is an LED screen, a field image would be displayed on it which would mirror the field of view observed by the lens 1020. The user may be
prompted to keep their eyes focused on a fixed point on the field of view through the lens while on the I/O data interface 450 the user may be prompted to manually highlight areas of the field image. These highlighted areas will also appear on the lens superimposed over the field of view. The user will highlight as much of the field image as possible without them being able to see their highlighting. This action is intended to define the blind spot of the user, and the image capture sensor can adapt to the blind spot field.

In another embodiment, the compressed image 1003 can be moved anywhere within the user's perceived field of view depending on the defined blind spot. The user can adjust the location, shape, size, and boundaries of the compressed image 1003. Alternatively, the user can adjust the location, shape, size, and boundaries of the picture in picture 1004 within the user's perceived field of view. Both methods of display adjustment can be achieved through the I/O data Interface 450. In a further embodiment, when the user has highlighted the blind spot 1160 in the field of view 1150, the processor 420 can position the obstructed field of view 1170 anywhere in the user's perceived field of view. Initially, the displays 1003 and 1004 may appear distorted to the user, but the displays can be adjusted to gradually train the user to adapt to the changes, and eventually optimise their experience with using the device 100.

In other embodiments, rather than augmenting a blind spots, such as by repeating the imagery that would have fallen within the blind spot in a non-blind spot of the user as described in the manner of above, the computing device 100 may be adapted for altering the user's field of view by manipulating the video data so as to present video data having any one of increased lighting, increased contrast, reduced glare and the like.

Additionally or alternatively, the video data may comprise magnified areas, such as within the central area of the user's vision, or alternatively magnified in accordance with a user selection. For example, the display means 450 may be adapted to display differing magnified portions in accordance with user input via the I/O Interface 450. For example, the user may manipulate a touch sensitive device within the pocket of the user much like a mouse trackpad to select portions within the user's field of vision for magnification. In this manner, the user may utilise the touch sensitive device to select areas of vision within their view for magnification. For
example, were the user reading a book, the user may configure the touch sensitive device to rectify the tower portion of the user's field of vision so as to magnify the text of the document while maintaining normal zoom on the remainder of the field of vision of the display means 415. In alternative embodiments, the computing device 100 may be adapted to detect a particular operating mode of the computing device 100 (such as when reading a book) so as to automatically magnify the tower portion of the user's field of view within the display means 415.

[947] In a yet further embodiment, the computing device 100 may be adapted to counter colour blindness of the user. In this manner, the computing device 100 may be adapted to be programmed that the user is colour blind, or may alternatively be adapted to detect the user is colour blindness. For example, where the user is looking at a substantially green background, the computing device 100 may be adapted to display in the colour red a message such as (can you see this?). If the user fails to respond that may provide the computing device 100 with an indication that the user is colour blind. The computing device 100 may complement such determination with other information such as the demographic of the user wherein male is known to be more prone to colour blindness.

[948] As such, for those user is known to be colour blind, the computing device one may be adapted to implement colour substitution for the purposes of making certain colours more apparent to the user. For example, the computing device 100 using a rearward facing camera, may track the orientation of the eyeballs of the user. Furthermore, using a forward facing camera, the computing device 100 may determine the colours of the scene viewed by the user. In this manner, the computing device 100 is adapted to overlay substitute across the uses field of vision to counter the colour blindness, such as where, for example the colour red substituted with the colour yellow when presented against a green background.

[949] In other embodiments, the computing device may be adapted for competent in colourblindness with other century input, such as audio. For example, it is known that certain users are unable to distant which covers of a traffic light. In this manner, the computing device 100 using an Image recognition technique determine the phase of a traffic light and play out an audio signal accordingly. For example, as soon as the traffic light changes to green, the computing device 100 may play out an audio signal or message to the user 100 Indicating such. In a yet further embodiment, the
computing device 100 may be adapted to, or similarly using an image processing
technique, partly the velocity of the user, and should the user be travelling above a
certain velocity and approaching a red traffic light the computing device 100 may be
adapted to play out inappropriate warning. It should be noted that such an
embodiment may be implemented where the computing device 100 takes
embodiment of the augmented reality headset 100b as substantially shown in figure
3. However, it should be noted that alternatively, the computing device 100 may be
implemented by way of a vehicle control system, wherein the vehicle is adapted to
measure the velocity of the vehicle, and utilise image recognition to identify hazards,
such as a red traffic light. In this manner, the vehicle control system may be adapted
to automate appropriate action, such as the application of the brakes of the vehicle
or the like.

[950] Body Posters

[951] In one embodiment, the mobile computing device 401 uses sensor input data
derived from the physical environment immediately surrounding the user as well as
the relative positions between the user’s body and the physical environment.

[952] The mobile computing device 401 may also be used by carers, such as
doctors, nurses and the like in the care of patients. For example, a doctor or nurse
may use the mobile computing device 401 to provide one or more vitality indicia
relating to a patient. For example, the device may be used to aid in the rehabilitation
process of a user recovering from an injury or impairment that has compromised
their ability to move. Alternatively, a doctor or nurse can track the rehabilitation
process of a user to determine if there is an improvement to their movements, as
well as determine if there are any unforeseen motion impairments that were not
Initially recognised. These can be downloaded directly from the device 401 or
through the network database 460.

[953] In another embodiment, the device 401 can receive sensor input data derived
from the movements of a user’s head using the orientation sensor 410a, which may
be at least one gyroscope that can measure changes in head tilt, neck twist, shaking
of body, and/or neck flexion in real-time. This data is communicated to the bus
subsystem 170, where it may be communicated to the processor 420. The data is
processed by the computer program code 430 in conjunction with the data derived
from the sensor 410b to form a combined vitality Indicia to be communicated to the headset 400.

[954] The mobile computing device may automatically detect the user's intended motions, or the user may define their intended motions via an I/O data Interface 450. The motions that the mobile computing device 401 may be able to analyse and correct include sitting, standing, walking, bending forwards, and kneeling. These motions may have reference values and reference vitality Indicia pre-programmed into the storage media 440, either by the user, manufacturer, or carer.

[955] In one embodiment, the stereoscopic image capture sensor 410b may be one or more cameras that determine the overall user's body orientation with respect to the external environment. These cameras may be able to determine distances between a user's extremities and distances from the external environment, as shown in figure 5. Alternatively, it may use an image recognition technique to define reference markers 510 either on the user 530 or the external environment 500 to be used to construct a computer-generated model 520 of the user. These reference markers 510 will be constantly tracked and updated in an automated manner depending on the user's movements, and the computer model will be updated accordingly within the processor 420.

[956] In another embodiment, the stereoscopic image capture sensor 410b may be one or more Infrared cameras adapted to analyse the user's limbs and body. These sensors can detect the heat radiated from the limbs or body of the user. The heat patterns are used to generate an image or video of the observed limb or body in an automated manner. The advantage of this type of sensor is that it does not require high resolution lenses or clear fields of view to analyse the user. There also does not need to be a source of light for the user to be visible to the sensor.

[957] The computer program code 430 functions to interpolate and/or extrapolate the required information from the sensors and process them in a language that allows the data to be compared with reference models for the physical movements of the user. The code also has the ability to determine a movement threshold, whereby if the user deviates from the threshold, the user is alerted that corrective action be taken. This corrective action is in the form of the user adjusting their stance and posture such that the deviation no longer exists. The alerts given by the code may
not only encompass vitality Indicia 305, but also verbal speech or sound cues understood by the user.

[958] The vitality Indicia may be shown graphically, where the scale may be in terms of length, and the user is alerted to change their stance or posture such that the Indicia reach a desired level. These would be displayed over the lens 1020 of the mobile computing device 100. Alternatively, if the output is in the form of audible speech, then the output may come from a speaker 410c, giving recommendations such as "Please straighten your legs/" "Please bend you back forwards/" "Tilt your head towards the back," and well as other suggestions. Intended to change the user's stance and posture.

[959] In one embodiment the user may intend to stand vertically straight, or in the anatomical position, and the computer program code 430 will define this reference position. The sensor 410b may be able to recognise the user's body extremities and allocate reference points on these. It may also be able to use the external environment to define reference planes to further define the user's geometry in relation to the environment. The sensor 410a is also employed to aid in defining the user's orientation. Once the user has assumed the anatomical position the sensor input data is sent to the bus subsystem 170 and external processor 420, where the computer program code 430 compares the reference makers 510 with the reference position as determined by the processor 420. The computer model 520 is then constructed and compared with the reference position. If the computer program code 430 recognises any deviation from the threshold positions it outputs a set of data Intended to alert the user of the deviation, as well as methods of correcting the deviation.

[960] In one embodiment the sensor 410 may be employed when the user intends to bend down to pick up a heavy object off the ground, and then to stand upright while holding said object. The sensor 410b operates by tracking reference markers as the user attempts to pick up the object, and the computer model 520 is constructed accordingly. The sensor 410a may be used to track if the user's head position is symmetric with their torso and the neck is parallel with their spine as the user bends. If there is a deviation from the reference positions then the user may be prompted to stop the task. Then, the device may tell the user to practice standing and leaning forwards a few times until the user masters this skill and there is no
deviation from this motion. Then, the device may tell the user to proceed by bending their knees a few times until the user masters this skill and there is no deviation from this motion. Eventually, if the computer program code 430 determines that the user is competent enough to pick up the object, they will be prompted to perform the task again. This process may repeat until the correct motion is learned.

[961] Preferably, the computer program code compares past and present motion data to determine changes to the vitality Indicia. In this way, the user or carer can track their overall performance when performing different motions. It can indicate what motions were performed that adversely affected their balance, and the times it occurred when the user had performed them. Further, the mobile computing device 401 can communicate wirelessly to an external network database 460 that can be accessed by a carer of the user. This person can access data from the device 401 that was sent and saved to the network database 460. In this way, the carer can monitor the instances where user motions were not performed correctly, as well as the ability to obtain the computer-generated model 520, better allowing the carer to visualise the user motions.

[962] In one embodiment, the device can be used by people in the construction industry, where manual labour is intensive and repetitive. When the user performs a task such as lifting heavy bricks the device can monitor the movements of the user as they perform the said task. A sensor may detect the positions of the user's hands or arms around the object. The computer program code may conclude that the user's grip will not allow the object to be handled safely, and by extension adversely affect the user's posture and how they handle the distribution of loads. Before the action is performed the user is prompted through the vitality indicia display that they are at risk of dropping the object or injuring themselves. The code may then recommend that the user practice the motions but using lighter objects.

[963] In one embodiment, the device may be used by office workers, and in particular, those that spend an extended amount of time sitting in front of a computer monitor. The device may track the motions of the user's arms, hands, and head as they are sitting. The user may not notice that their head is gradually leaning forwards, but the computer program code can determine the amount of neck and spine flexion, as well as the rate of change of this flexion. If the flexion is beyond the predetermined threshold for proper function, the user is prompted through the vitality
Indicia. The code may also recognise the motions of typing by tracking finger movements across a keyboard. If the rate of movements is found to slow down over time, the user may be prompted of this as an indication for tiredness and fatigue.

[964] In another embodiment, the sensors used to detect motion can further be applied to detect body motion data of other people observed by the user. The same methods of locating reference locations and relative limb and body movements still apply, but the user has the ability to observe and walk around the person performing the actions. The computer program code can be prompted, via the data Interface, to record the movements of the observed person. Vitality Indicia can then be displayed to the user, and the user can be prompted to tell the observed person their vitality Indicia. An application of this is a doctor observing a patient with mobility Impairment undergoing physiotherapy treatment. The doctor can walk around the observed person and be prompted in real-time if their movements pass or fail to meet a predetermined threshold. The advantage of this method is that the doctor can walk around the patient without disrupting the sensors, unlike current motion capture techniques that require stationary sensors and the observed person to stand in front of a single colour background e.g. green screen.

[965] The vitality Indicia 180 may be displayed as a set of graphs categorised according to limb, neck, head, or other anatomical features. Each Index can be scaled according to length, angle, or relative changes in these measurements. It can also be displayed as time-dependent changes in the movements and deviations from the reference values. Alternatively, the Index can be in terms of a progress chart 800 for the more complicated movements such as picking up an object off the ground. For this Index 600, the scale denotes the actions required to complete a given motion, and the coloured bar moves along the scale for each movement accomplished.

[966] The vitality Indicia for the aforementioned embodiment comprises any indicia relating to the physical movements of the user when they are standing, sitting, kneeling, walking, or any other forms of body movements. For example, a user may use the mobile computing device 401 for continually monitoring one or more vitality Indicia. For example, the mobile computing device 401 may be adapted to continually measure whether the user is gradually leaning to one side when Intending to stand upright, which may be Indicative of scoliosis in the user's spine, or
weak knee joints. Alternatively, the mobile computing device 401 may be adapted to measure how balanced the user is when performing tasks such as picking up an object from the ground.

[967] The headset 400 can also display animations of different motions of sitting, standing, walking, or lifting objects. These animations can be obtained from the storage media 440, network database 460, or memory of the processor 420. The processor memory 420 comprises the computer-generated figure 520, which can be displayed alongside the vitality indicia 180 to show the user the correct motions and highlight where the motions have gone wrong.

[968] In embodiments, rather than detecting improper body posture for the purposes of remedial action, the computing device 100 may be adapted for detecting existing conditions such as scoliosis. For example, the computing device 100 utilising the orientation sensor 410a (which may include appropriate gyroscopes and accelerometers) may detect symptoms of scoliosis such as lumbar prominence, or centre head position, hip and shoulder alignments being uneven in the like.

[969] As such, in the computing device 190 detecting bad posture, or detecting existing disorder such as scoliosis and the like, the computing device 100 may, as alluded to above, be adapted to instruct the user to take remedial action. In this manner, where the computing device 100 to detect that the user is flushed over their workstation, the computing device 100 may display an adverse posture icon with a message informing the user to sit up straight. In other embodiments, the computing device 100 may merely gather blometric data for the purposes of analysis by a specialist such as an orthopaedic surgeon, occupational therapist and the like. For example, the computing device 100 may be adapted to record the average angular orientation of the user spine so that the specialist can make an informed opinion as to whether the user is improving or not.

[979] In another embodiment, the computing device 100 may be adapted for gait remediation, which may be applicable for use as suffering from Parkinson's disease and exhibit Dyskinesia, a movement disorder consisting of diminishing voluntary movements and an increase of involuntary movements. While Dyskinesia is most common in the upper body, it can also be seen in the lower extremities. The gait remediation performed by the computing device 100 may vary from simply notifying the user, or the health provider, as to the existence of the problem, or by assisting
the user in overcoming the problem. In assisting the user in overcoming the problem, the computing device 100 may be adapted to direct the user as to the placement of their feet. For example, the computing device 100 may be adapted to play out an audio signal, such as a metronome signal, corresponding to the pace at which the computing device 100 determines the user should be travelling (which determination may employ video processing techniques to determine the velocity of the user). In this manner, upon hearing the "tick tick" sound from the computing device 100, the user may consciously attempts to place their feet in accordance with the signal. In a more advice embodiment, the computing device 100 may be adapted to display virtual footprints in front of the user, so as to direct the user as to the appropriate location to place their feet.

[971] In a yet further embodiment, the computing device 100 may be adapted to detect and prevent in balance and fall, especially for older users. In this embodiment, the computing device 100 may be adapted to receive data from various orientation and accelerometers sensors to predict an Impending imbalance and potential fall. In such a situation, the computing device 100 may be adapted to warn the user to stop what they are doing, such as by sitting down for example. Should be noted that the computing device 100 may be adapted to receive orientation and acceleration data not only from sensors approximate to the computing device 100 but may also receive such Information from remote devices, such as acceleration and orientation sensors located within the belt or wristbands of the user, or by way of pressure sensitive Insoles within the shoes of the user, adapted to track gait, tilt and swerve. In a further embodiment, the computing device 100 may be adapted to deploy a protective mechanisms for the user. For example, should use be prone to breaking a hip, such as where the user is elderly and has skeletal degradation, the user may be provided with a belt comprising a series of peripherally located airbags. In this manner, should the computing device 100 detect a fall, the computing device 100 may be adapted to fire the appropriately located airbags for the purposes of cushioning the users fall.

[S72] Reporting of biometric data

[973] In one embodiment, the computing device 100 is adapted to report the measured biometric data or other vitality Indica of the user to the user's nominated provider or other appropriate person. For example, the users blood pressure measurements may be reported daily to the nominated doctor of the user such that
the user's doctor is able to make a determination as to when the user should come in for a checkup. Specifically, the computing device 100 may send the data via the network Interface 170 to the appropriate person. The computing device 100 may be configured with the details of recipient of the data (such as by way of e-mail address, API or the like), or the computing device 100 may transmit the data to the application server 210 for which the user is registered, the application server 210 being configured with the contact details of the appropriate recipient for the data.

[974] It should be noted that in one embodiment, as opposed to the doctor making the determination is to when the user should make an appointment, the computing device 100 or the application server 210 may make such a determination. For example, the computing device 100 or the application server 210 may be configured with a blood pressure threshold, such that when the user's blood pressure exceeds the threshold, the computing device 100 or application server 210 is adapted to create a booking with the user's nominated treatment doctor.

[975] In other applications, the computing device 100 may merely record the blometric data or other vitality Indicia of the user so as to provide a summary for the user's treatment doctor at the user's usual consultation. In this and bottom, the computing device 100 need not necessarily send the data via the network Interface 170 and make it the Information within storage device 1030 or 110 for retrieval when requested.

**Anxiety disorder Detection**

**Mobile computing device**

[976] Fig. 1 shows a mobile computing device 100 on which the various embodiments described herein may be implemented. In particular the steps of detecting a user anxiety disorder may be implemented as computer program code Instructions executable by the mobile computing device 100.

[977] In a preferred embodiment, the mobile computing device 100 is a wearable mobile computing device, such as, for example, the glasses 100b as substantially shown in figure 3. In its further embodiments, the mobile computing device 100 may comprise constituent parts, where for example, the mobile computing device 100 comprises a headset coupled to a computing device, such as a computing device located in the user's pocket or located in a remote location, wherein the constituent
parts cooperate for the purpose of detecting a user anxiety disorder in the manner described herein.

[978] As will become apparent from the disclosure shearing, the mobile computing device 100 is adapted for detecting the occurrence of use anxiety disorder, such that remedial steps may be taken. Such remedial steps may comprise alerting the user as to the occurrence of the anxiety, providing Instructions to the user as to how to address anxiety, or alerting the third person so as to be able to assist the user.

[979] The computer program code Instructions may be divided Into one or more computer program code Instruction libraries, such as dynamic link libraries (DLL), wherein each of the libraries performs a one or more steps of the method. Additionally, a subset of the one or more of the libraries may perform graphical user Interface tasks relating to the steps of the method.

[980] The device 100 comprises semiconductor memory 110 comprising volatile memory such as random access memory (RAM) or read only memory (ROM). The memory 100 may comprise either RAM or ROM or a combination of RAM and ROM.

[981] The device 100 comprises a computer program code storage medium reader 130 for reading the computer program code Instructions from computer program code storage media 120. The storage media 120 may be optical media such as CD-ROM disks, magnetic media such as floppy disks and tape cassettes or flash media such as USB memory sticks.

[982] The device 100 further comprises I/O Interface 140 for communicating with one or more peripheral devices. The I/O interface 140 may offer both serial and parallel Interface connectivity. For example, the I/O Interface 140 may comprise a Small Computer System Interface (SCSI), Universal Serial Bus (USB) or similar I/O Interface for Interfacing with the storage medium reader 130. The I/O Interface 140 may also communicate with one or more human Input devices (HID) 160 such as keyboards, pointing devices, joysticks and the like. The I/O interface 140 may also comprise a computer to computer Interface, such as a Recommended Standard 332 (RS-232) Interface, for Interfacing the device 100 with one or more personal computer (PC) devices 190. The I/O interface 140 may also comprise an audio Interface for communicate audio signals to one or more audio devices 1050, such as a speaker or a buzzer.
[983] The device 100 also comprises a network interface 170 for communicating with one or more computer networks 180. The network 180 may be a wired network, such as a wired Ethernet™ network or a wireless network, such as a Bluetooth™ network or IEEE 802.11 network. The network 180 may be a local area network (LAN), such as a home or office computer network, or a wide area network (WAN), such as the Internet or private WAN.

[984] The device 100 comprises an arithmetic logic unit or processor 1000 for performing the computer program code Instructions. The processor 1000 may be a reduced Instruction set computer (RISC) or complex instruction set computer (CISC) processor or the like. The device 100 further comprises a storage device 1030, such as a magnetic disk hard drive or a solid state disk drive.

[985] Computer program code instructions may be loaded into the storage device 1030 from the storage media 120 using the storage medium reader 130 or from the network 180 using network interface 170. During the bootstrap phase, an operating system and one or more software applications are loaded from the storage device 1030 into the memory 110. During the fetchdecode-execute cycle, the processor 1000 fetches computer program code instructions from memory 110, decodes the Instructions into machine code, executes the Instructions and stores one or more Intermediate results in memory 100.

[986] In this manner, the Instructions stored in the memory 110, when retrieved and executed by the processor 1000, may configure the mobile computing device 100 as a special-purpose machine that may perform the functions described herein.

[987] The device 100 also comprises a video Interface 1010 for sending and receiving video signals to a display device 1020, such as a liquid crystal display (LCD), cathode-ray tube (CRT) or similar display device. The device also comprises video capture 1025 for capturing video and image data. In a preferred embodiment, the display device 1020 is an augmented reality display device as substantially shown in figure 3. In this manner, the device 100 is adapted to display Information to the user in augmented reality.

[988] The device 100 also comprises a communication bus subsystem 150 for Interconnecting the various devices described above. The bus subsystem 150 may offer parallel connectivity such as Industry Standard Architecture (ISA), conventional Peripheral Component Interconnect (PCI) and the like or serial connectivity such as
PCI Express (PCIe), Serial Advanced Technology Attachment (Serial ATA) and the like.

System

[989] Fig. 2 shows an exemplary system 200 of computing devices 100 on which the various embodiments described herein may be implemented. Such a system 200 may be employed, where, for example remote data processing is required for the purposes of detecting the user anxiety disorder.

[990] As is evident from the figure 2, the system 200 comprises an application server 210 in communication with one or more mobile computing devices 100 across a data network 180. In this manner, the mobile computing devices 100 operable to send environment input data to the application server 210 and receive from the application server 210 data representing the occurrence of the anxiety disorder. Such an arrangement is especially advantageous wherein, for example, processor Intensive computing technique such as image recognition and the like are employed. In this manner, the Intensive computing may be offloaded to the application server 210 blowing for mobile computing devices 100 with less processing power to be employed.

[991] In one embodiment, a "dumb" or "thin" wearable device may be used as an little or no processing power Instead of the mobile computing device 100. In this manner, the user wears the wearable device, and the wearable device comprises one or more sensors as described herein. In this embodiment, Instead of the device performing any processing of the environmental input data, the environmental input data is forwarded to the application server 210 for processing by the application server 210.

Detecting a user anxiety disorder

[992] Exemplary embodiments in detecting a user anxiety disorder will now be discussed. The mobile computing device 100 may be provided to sufferers of anxiety disorders for the purposes of treating such disorders. The mobile computing device 100 may be adapted to alert the user to the occurrence of the anxiety disorder or allow a third party to be notified to take appropriate action. In certain circumstances, a person may not realise that they are exhibiting characteristics of an anxiety
disorder. In this manner, the mobile computing device 100 is operable to detect the occurrence of the anxiety disorder lest it go unnoticed.

[993] It should be noted that various anxiety disorders may be detected by the mobile computing device 100. Such anxiety disorders may comprise obsessive-compulsive disorders including excessive washing, checking, counting, arranging, hoarding and the like. It should furthermore be noted that the mobile computing device 100 may be adapted to detect other disorders other than anxiety disorders. For example that mobile computing device 100 may be adapted to detect the occurrence of antisocial behaviour such as domestic violence, theft and the like.

[994] Furthermore, the mobile computing device 100 may be adapted to facilitate remedial compliance, such as parole conditions and the like.

[995] Considering now the components of the mobile computing device 100, the mobile computing device 100 typically comprises a processor 1004 processing digital data and a memory device 110 for storing digital data. Furthermore, the mobile computing device 100 comprises an environment sensor 105 for sensing various environmental inputs as the case may be.

[996] As will be described in further detail below, the mobile computing device 100 is operable to receive, from the sensor 105, environment input data representing at least one environment input (such as image data, audio data and the like) and calculating the occurrence of anxiety disorder in accordance with the environment input.

[997] In a first embodiment, environment input data comprises image data. In this manner, the mobile computing device 100 is operable to recognise an event or scenario from the image data. In this manner, the environment sensor 105 comprises an image capture means, such as the still image capture means or video capture means.

[998] The mobile computing device 100 may be adapted to calculate the occurrence of anxiety disorder in accordance with an image recognition technique. As alluded to above, such image recognition technique may be performed by the mobile computing device 100 itself, or the Image data may be sent across the data network 180 to the application server 210 for processing by the application server 210.
There are various Image recognition techniques that may be employed depending on the application. In a first embodiment, the Image recognition technique comprises recognising an object. For example, the mobile computing device 100 may be adapted to recognise a bottle of alcohol where the user is prone to drinking.

In another example, where the mobile computing device 100 is adapted to detect excessive washing, the mobile computing device may be adapted to recognise a tap or bathroom sink. Where the mobile computing device 100 is adapted to detect obsessive-compulsive disorder, such as repetitive behaviour, the Image recognition technique may comprise receiving first image data at a first time and second Image data at a second time and correlating the first image data and the second image data to detect a similarity. For example, if the first image data and the second image data were substantially the same at differing times, the mobile computing device 100 may recognise a repetitive action. Of course in other embodiments, more than one Image may be taken for the purposes of identifying repetitive action.

In a preferred embodiment, the image data comprises video data such that the mobile computing devices need not take discreet snapshots of the user’s environment. As the processing of video data is typically computationally expensive, the video data or at least a representative subset thereof may be forwarded to the application server 210 for the purposes of processing.

In other embodiments, the mobile computing device 100 may be adapted to determine the occurrence of an anxiety disorder by other means. For example, the sensor 105 may comprise a microphone for the purposes of capturing audio data. In this manner, whether user suffers from excessive counting, the mobile computing device 100 may be adapted to employ an audio recognition technique to recognise repetitive audio signals.

The audio recognition technique may be adapted to identify not only repetitive audio sounds, but also specific sounds, such as swearing, raised voices and the like.

In a yet further embodiment, the mobile computing device 100 may be adapted to use movement for the purposes of detecting the occurrence of the anxiety disorder. For example, certain repetitive actions may be detected by a repetitive movement. In this manner, the sensor 105 may comprise a tri-axial gyroscope (such as a solid-state gyroscope) for the purposes of detecting acceleration. Using the gyroscope, the mobile computing device 100 may be
furthermore adapted to detect not only repetitive movements, but also individual movements. In this manner, the sensor 105 may be located at at least one appendage of the user, such as by means of a wrist band or the like. In this manner the movement of the users arm may be ascertained by the mobile computing device 100.

[1004] Having detected the occurrence of the anxiety disorder, the mobile computing device 100 maybe adapted to output an Indication of the occurrence of anxiety disorder. As such, the mobile computing device 100 comprises an interface for outputting the indication.

[1005] There are various matters in which the mobile computing device 100 may indicate the occurrence of the anxiety disorder. In a first embodiment, the Interface comprises a haptic interface, such that the user may be alerted to the occurrence of the anxiety disorder by a touch sensation, such as whether haptic Interface is adapted to vibrate.

[1000] Of course, the interface may alert the user by other means, such as by playing out an audible tone, or generating a visible light for example.

[1007] In one embodiment, the interface comprises a data interface for sending data across the data network 180 to the application server 210. In this manner, the application server 210 may further process that indication, such as for example by alerting a third party, recordal purposes and the like.

[1008] In one embodiment, and especially the embodiment as substantially shown in Figure 3B wherein that mobile computing device takes the form of a pair of glasses 100b, the Interface comprises a display device 1020 such that the display device 1020 is operable to display the indication of the occurrence of the anxiety disorder. Referring to the employment given in figure 3B, the display device is preferably overlaid the uses field of vision, such as a liquid crystal display device overlaid the lenses of the glasses 100b. In this manner, text, Images and the like may be displayed in the uses field of vision. In the example given, once their mobile computing device 100b has detected the occurrence of the anxiety disorder, the mobile computing device 100b is operable to display the Indication 405 in the uses field of vision. In the example given, the Indication 405 displays a textual warning alerting the user as to the occurrence of the anxiety disorder. In the example given, the indication 405 warns the user that the user is displaying obsessive-compulsive
characteristics. The indication 405 may further comprise instructions for addressing
the anxiety disorder such as, using the example given in figure 5, the indication 405
instructs user to take their medicine.

As alluded to above, the mobile computing device 100 may take the form of
an integral unit or a computing device having constituent parts. For example, the
glasses 100b is shown in figure 3B may comprise a processor for on-board
processing. In another example, the glasses 100b.

Interpretation

Bus

In the context of this document, the term "bus" and its derivatives, while being
described in a preferred embodiment as being a communication bus subsystem for
Interconnecting various devices including by way of parallel connectivity such as
Industry Standard Architecture (ISA), conventional Peripheral Component
Interconnect (PCI) and the like or serial connectivity such as PCI Express (PCIe),
Serial Advanced Technology Attachment (Serial ATA) and the like, should be
construed broadly herein as any system for communicating data.

In accordance with:

As described herein, in accordance with' may also mean 'as a function of
and is not necessarily limited to the integers specified in relation thereto.

Composite items

As described herein, 'a computer implemented method' should not
necessarily be inferred as being performed by a single mobile computing device
such that the steps of the method may be performed by more than one cooperating
mobile computing devices.

Similarly objects as used herein such as 'web server;' 'server,' 'client mobile
computing device', 'computer readable medium' and the like should not necessarily
be construed as being a single object, and may be implemented as a two or more
objects in cooperation, such as, for example, a web server being construed as two or
more web servers in a server farm cooperating to achieve a desired goal or a
computer readable medium being distributed in a composite manner, such as
program code being provided on a compact disk activatable by a license key
downloadable from a computer network.
In the context of this document, the term "database" and its derivatives may be used to describe a single database, a set of databases, a system of databases or the like. The system of databases may comprise a set of databases wherein the set of databases may be stored on a single Implementation or span across multiple Implementations. The term "database" is also not limited to refer to a certain database format rather may refer to any database format. For example, database formats may include MySQL, MySQL!, XML or the like.

The invention may be embodied using devices conforming to other network standards and for other applications, including, for example other WLAN standards and other wireless standards. Applications that can be accommodated include IEEE 802.11 wireless LANs and links, and wireless Ethernet.

In the context of this document the term "wireless" and its derivatives may be used to describe circuits, devices, systems, methods, techniques, communications channels, etc., that may communicate data through the use of modulated electromagnetic radiation through a non-solid medium. The term does not imply that the associated devices do not contain any wires, although in some embodiments they might not. In the context of this document, the term "wired" and its derivatives may be used to describe circuits, devices, systems, methods, techniques, communications channels, etc., that may communicate data through the use of modulated electromagnetic radiation through a solid medium. The term does not imply that the associated devices are coupled by electrically conductive wires.

Processes:

Unless specifically stated otherwise, as apparent from the following discussions, it is appreciated that throughout the specification discussions utilizing terms such as "processing", "computing", "calculating", "determining", "analysing" or the like, refer to the action and/or processes of a computer or computing system, or similar electronic mobile computing device, that manipulate and/or transform data represented as physical, such as electronic, quantities into other data similarly represented as physical quantities.

Processor:

In a similar manner, the term "processor" may refer to any device or portion of a device that processes electronic data, e.g., from registers and/or memory to
transform that electronic data into other electronic data that, e.g., may be stored in registers and/or memory. A "computer" or a "mobile computing device" or a "computing machine" or a "computing platform" may include one or more processors. [1027] The methodologies described herein are, in one embodiment, performable by one or more processors that accept computer-readable (also called machine-readable) code containing a set of instructions that when executed by one or more of the processors carry out at least one of the methods described herein. Any processor capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken are Included. Thus, one example is a typical processing system that includes one or more processors. The processing system further may include a memory subsystem including main RAM and/or a static RAM, and/or ROM. [1028] In this specification, where processor functionality is described, this refers to a computing processor executing computer program code comprising Instructions for allowing the processor to achieve the functionality being described in relation to the processor.

1§28 Computer-Readable Medium:
[1030] Furthermore, a computer-readable carrier medium may form, or be Included in a computer program product. A computer program product can be stored on a computer usable carrier medium, the computer program product comprising a computer readable program means for causing a processor to perform a method as described herein.

1031 Networked or Multiple Processors:
[1032] In alternative embodiments, the one or more processors operate as a standalone device or may be connected, e.g., networked to other processors, in a networked deployment, the one or more processors may operate in the capacity of a server or a client machine in server-client network environment, or as a peer machine in a peer-to-peer or distributed network environment. The one or more processors may form a web appliance, a network router, switch or bridge, or any machine capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken by that machine.
[1033] Note that while some diagram(s) only show(s) a single processor and a single memory that carries the computer-readable code, those in the art will understand that many of the components described above are Included, but not explicitly shown
or described in order not to obscure the inventive aspect. For example, while only a single machine is illustrated, the term "machine" shall also be taken to include any collection of machines that individually or jointly execute a set (or multiple sets) of instructions to perform any one or more of the methodologies discussed herein.

[1034] **Additional Embodiments:**

[1035] Thus, one embodiment of each of the methods described herein is in the form of a computer-readable carrier medium carrying a set of instructions, e.g., a computer program that are for execution on one or more processors. Thus, as will be appreciated by those skilled in the art, embodiments of the present invention may be embodied as a method, an apparatus such as a special purpose apparatus, an apparatus such as a data processing system, or a computer-readable carrier medium. The computer-readable carrier medium carries computer readable code including a set of instructions that when executed on one or more processors cause a processor or processors to implement a method. Accordingly, aspects of the present invention may take the form of a method, an entirely hardware embodiment, an entirely software embodiment or an embodiment combining software and hardware aspects. Furthermore, the present invention may take the form of carrier medium (e.g., a computer program product on a computer-readable storage medium) carrying computer-readable program code embodied in the medium.

[1036] **Carrier Medium:**

[1037] The software may further be transmitted or received over a network via a network Interface device. While the carrier medium is shown in an example embodiment to be a single medium, the term "carrier medium" should be taken to include a single medium or multiple media (e.g., a centralized or distributed database, and/or associated caches and servers) that store the one or more sets of Instructions. The term "carrier medium" shall also be taken to include any medium that is capable of storing, encoding or carrying a set of instructions for execution by one or more of the processors and that cause the one or more processors to perform any one or more of the methodologies of the present invention. A carrier medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media.

[1038] **Implementation:**
It will be understood that the steps of methods discussed are performed in one embodiment by an appropriate processor (or processors) of a processing (i.e., computer) system executing instructions (computer-readable code) stored in storage. It will also be understood that the invention is not limited to any particular Implementation or programming technique and that the invention may be implemented using any appropriate techniques for implementing the functionality described herein. The Invention is not limited to any particular programming language or operating system.

Means For Carrying out a Method or Fynstlon

Furthermore, some of the embodiments are described herein as a method or combination of elements of a method that can be implemented by a processor of a processor device, computer system, or by other means of carrying out the function. Thus, a processor with the necessary Instructions for carrying out such a method or element of a method forms a means for carrying out the method or element of a method. Furthermore, an element described herein of an apparatus embodiment is an example of a means for carrying out the function performed by the element for the purpose of carrying out the Invention.

Coy pled

Similarly, it is to be noted that the term "coupled", when used in the claims, should not be Interpreted as being limitative to direct connections only. Thus, the scope of the expression a device A coupled to a device B should not be limited to devices or systems wherein an output of device A is directly coupled to an Input of device B. It means that there exists a path between an output of A and an Input of B which may be a path Including other devices or means. "Coupled" may mean that two or more elements are either in direct physical or electrical contact, or that two or more elements are not in direct contact with each other but yet still co-operate or Interact with each other. A wireless communication capability is one example of a "coupling" in this specification.

Embodiments;

Reference throughout this specification to "one embodiment" or "an embodiment" means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases "in one embodiment" or "in an
embodiment" in various places throughout this specification are not necessarily all referring to the same embodiment, but may. Furthermore, the particular features, structures or characteristics may be combined in any suitable manner, as would be apparent to one of ordinary skill in the art from this disclosure, in one or more embodiments.

[1046] Similarly it should be appreciated that in the above description of example embodiments of the Invention, various features of the Invention are sometimes grouped together in a single embodiment, figure, or description thereof for the purpose of streamlining the disclosure and aiding in the understanding of one or more of the various Inventive aspects. This method of disclosure, however, is not to be interpreted as reflecting an intention that the claimed Invention requires more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive aspects lie in less than all features of a single foregoing disclosed embodiment. Thus, the claims following the Detailed Description of Specific Embodiments are hereby expressly incorporated into this Detailed Description of Specific Embodiments, with each claim standing on its own as a separate embodiment of this invention.

[1047] Furthermore, while some embodiments described herein include some but not other features included in other embodiments, combinations of features of different embodiments are meant to be within the scope of the Invention, and form different embodiments, as would be understood by those in the art. For example, in the following claims, any of the claimed embodiments can be used in any combination.

[1048] Different Instances of Objects

[1049] As used herein, unless otherwise specified the use of the ordinal adjectives "first", "second", "third", etc., to describe a common object, merely indicate that different Instances of like objects are being referred to, and are not intended to imply that the objects so described must be in a given sequence, either temporally, spatially, in ranking, or in any other manner.

[1050] Specific Details

[1051] In the description provided herein, numerous specific details are set forth. However, it is understood that embodiments of the invention may be practiced without these specific details. In other Instances, well-known methods, structures
and techniques have not been shown in detail in order not to obscure an understanding of this description.

[\[52\] Terminology

[1053] In describing the preferred embodiment of the invention illustrated in the drawings, specific terminology will be resorted to for the sake of clarity. However, the Invention is not Intended to be limited to the specific terms so selected, and it is to be understood that each specific term includes all technical equivalents which operate in a similar manner to accomplish a similar technical purpose. Terms such as "forward", "rearward", "radially", "peripherally", "upwardly", "downwardly", and the like are used as words of convenience to provide reference points and are not to be construed as limiting terms.

[\[54\] Comprising and Including

[1055] In the claims which follow and in the preceding description of the invention, except where the context requires otherwise due to express language or necessary implication, the word "comprise" or variations such as "comprises" or "comprising" are used in an inclusive sense, i.e. to specify the presence of the stated features but not to preclude the presence or addition of further features in various embodiments of the Invention.

[1056] Any one of the terms: including or which includes or that includes as used herein is also an open term that also means including at least the elements/features that follow the term, but not excluding others. Thus, including is synonymous with and means comprising.

[1057] Scope of Invention

[1058] Thus, while there has been described what are believed to be the preferred embodiments of the invention, those skilled in the art will recognize that other and further modifications may be made thereto without departing from the spirit of the Invention, and it is intended to claim all such changes and modifications as fall within the scope of the Invention. For example, any formulas given above are merely representative of procedures that may be used. Functionality may be added or deleted from the block diagrams and operations may be interchanged among functional blocks. Steps may be added or deleted to methods described within the scope of the present Invention.
Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that the Invention may be embodied in many other forms.

Industrial Applicability

It is apparent from the above, that the arrangements described are applicable to the medical diagnosis industry.
Claims

1. A mobile computing device for calculating vitality indicia, the mobile computing device comprising:

   a processor for processing digital data:

   a memory device for storing digital data including computer program code and being coupled to the processor;

   an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor,

   one or more sensors for capturing environment input data and being coupled to the processor, wherein the processor is controlled by the computer program code to:

   receive, from the one or more sensors, the environment input data,

   calculate the vitality indicia in accordance with the environment input data, and

   display, using the augmented reality display device, the vitality indicia.

1A. A mobile computing device as claimed in claim 1, wherein the calculating of the vitality Indicia comprises detecting a user anxiety disorder wherein the calculating of the vitality indicia comprises calculating the occurrence of the anxiety disorder.

2. A mobile computing device as claimed in claim 1, wherein the environment input data comprises image data.

3. A mobile computing device as claimed in claim 2, wherein in calculating the vitality Indicia, the processor is further controlled by the computer program code to calculate the vitality Indicia in accordance with an image recognition technique applied to the image data.

4. A mobile computing device as claimed in claim 3, wherein the image recognition technique is adapted for recognising an object.
5. A mobile computing device as claimed in claim 4, wherein the object is a meal and wherein the processor is controlled by the computer program code to:

calculate the nutritional composition of the meal; and

calculate the vitality Indicia in accordance with the nutritional composition.

6. A mobile computing device as claimed in claim 5, wherein the processor is further controlled by the computer program code to calculate nutritional deficiency in accordance with the nutritional composition.

7. A mobile computing device as claimed in claim 6, wherein the vitality Indicia comprises a meal suggestion or plan and the processor is further controlled by the computer program code to calculate the meal suggestion or plan in accordance with the nutritional deficiency.

8. A mobile computing device as claimed in claim 3, wherein the image recognition technique is adapted for recognising an action of a person.

9. A mobile computing device as claimed in claim 8, wherein the person is a wearer of the augmented reality display device.

10. A mobile computing device as claimed in claim 8, wherein the Image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

11. A mobile computing device as claimed in claim 8, wherein the action represents compliance with a treatment regime.

12. A mobile computing device as claimed in claim 8, wherein the action represents actions selected from the set of actions comprising: coughing, sneezing and blinking actions.

13. A mobile computing device as claimed in claim 8, wherein the vitality indicia represents a level of awareness or tiredness.
14. A mobile computing device as claimed in claim 8, wherein at least one sensor of the one or more sensors comprises a rearward facing image capture device adapted for capturing image data relating to at least a part of the face of the user.

15. A mobile computing device as claimed in claim 14, wherein the at least a part of the face of the user is at least a part of an eye of the user and wherein the processor is further controlled by the computer program code to calculating the vitality Indicia in accordance with a characteristic of the eye.

16. A mobile computing device as claimed in claim 15, wherein the characteristic of the eye is one characteristic from the following set of characteristics:

10. (I) redness

(II) swelling; and

(Hi) dark ring.

17. A mobile computing device as claimed in claim 16, wherein the augmented reality display device comprises a view-through means and a transparency control means which is controlled by the processor, the view-through means comprising at least a portion having a transparency that can be adjusted by the transparency control means, and the processor is controlled by the computer program code to Instruct the control means to darken the at least a portion of the view-through means in accordance with the characteristic of the eye.

18. A mobile computing device as claimed in claim 8, wherein at least one sensor of the one or more sensors comprises a forward facing image capture device is adapted for capturing image data from within a wearers' field of vision.

19. A mobile computing device as claimed in claim 1, wherein at least one sensor of the one or more sensors is a temperature sensor and the vitality indicia represents a body temperature of a wearer of the augmented reality display device determined in accordance with data received from the temperature sensor.

20. A mobile computing device as claimed in claim 1, wherein the environmental input data comprises audio data.
21. A mobile computing device as claimed in claim 20, wherein, in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality indicia in accordance with an audio recognition technique.

22. A mobile computing device as claimed in claim 21, wherein the audio recognition technique is adapted for recognising sounds within the audio data.

23. A mobile computing device as claimed in claim 22, wherein the sound is selected from the set of sounds comprising: coughing, hiccupping, sneezing and obstructed airways sounds.

24. A mobile computing device as claimed in claim 23, wherein at least one sensor of the one or more sensors comprises a stethoscope interface for receiving audio from a stethoscope in use.

25. A mobile computing device as claimed in claim 1, wherein the environmental input data comprises acceleration data.

26. A mobile computing device as claimed in claim 25, wherein in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality indicia in accordance with a movement recognition technique applied to the acceleration data.

27. A mobile computing device as claimed in claim 26, wherein the movement recognition technique comprises recognising a movement.

28. A mobile computing device as claimed in claim 27, wherein the movement represents an exercise movement selected from the set of exercise movements comprising walking, talking and running exercise movements.

29. A mobile computing device as claimed in claim 27, wherein the movement comprises at least a vibrational component and the processor is further controlled by the computer program code to diagnose instances of sleep disordered breathing in accordance with the movement.

30. A mobile computing device as claimed in claim 29, wherein the environmental input data further comprises audio data and in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality
Indicia in accordance with an audio recognition technique that is adapted for recognising sleep disordered breathing sounds within the audio data.

31. A mobile computing device as claimed in claim 1, wherein the environment input data comprises orientation data.

32. A mobile computing device as claimed in claim 31, wherein, in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality indicia in accordance with an orientation recognition technique.

33. A mobile computing device as claimed in claim 32, wherein the orientation recognition technique is adapted for recognising an orientation of a wearer of the augmented reality display device in use.

34. A mobile computing device as claimed in claim 33, wherein the processor is further controlled by the computer program code to calculate the resting state of a wearer of the augmented reality display device in accordance with the orientation.

35. A mobile computing device as claimed in claim 1, further comprising a data interface for sending and receiving data across a data network, the data interface being coupled to the processor, wherein the processor is controlled by the computer program code to send, via the data interface, the environment input data.

36. A mobile computing device as claimed in claim 35, wherein the processor is further controlled by the computer program code to send the environment input data to an application server.

37. A mobile computing device as claimed in claim 35, wherein the processor is further controlled by the computer program code to send the environment input data to another mobile computing device.

38. A mobile computing device as claimed in claim 35, wherein the processor is further controlled by the computer program code to send the environment input data to another mobile computing device when a wearer of the augmented reality display device of the mobile computing device looks at a wearer of the augmented reality display device of the another mobile computing device.
39. A mobile computing device as claimed in claim 35, wherein the processor is further controlled by the computer program code to receive, via the data interface, vitality Indicia data representing the vitality Indicia.

40. A mobile computing device as claimed in claim 35, wherein the processor is further controlled by the computer program code to receive the vitality Indicia data from an application server.

41. A mobile computing device as claimed in claim 37, wherein the processor is further controlled by the computer program code to receive other environment Input data from another mobile computing device and to calculate the vitality Indicia further in accordance with the other environment Input data.

42. A mobile computing device as claimed in claim 1, wherein the processor is further controlled by the computer program code to calculate a vitality category in accordance with the environment Input data.

43. A mobile computing device as claimed in claim 1, wherein the processor is further controlled by the computer program code to calculate a diagnosis data in accordance with the environment Input data.

44. A mobile computing device as claimed in claim 43, wherein the processor is further controlled by the computer program code to calculate one or more appropriate remedies in accordance with the diagnosis data.

45. A mobile computing device as claimed in claim 44, wherein the one or more remedies are each a remedy from the following set of remedies:

(I) a medication

(II) an exercise

(iii) a diet suggestion

(iv) a lifestyle suggestion

(v) a therapy suggestion

(vi) a product suggestion
46. A mobile computing device as claimed in claim 44, wherein the vitality indicia comprises the one or more remedies.

47. A mobile computing device as claimed in claim 44, wherein the one or more remedies are communicated to a user of the mobile computing device audibly.

48. A mobile computing device as claimed in claim 46, wherein the one or more remedies comprise a branded product suggestion.

49. A mobile computing device as claimed in claim 46, wherein the one or more remedies is a branded medication remedy.

50. A mobile computing device as claimed in claim 43, further comprising a data communications Interface and wherein in calculating the diagnosis data, the processor is controlled by the computer program code to send the environment input data to a server via the data communications Interface and receive back from the server, the diagnosis data.

51. A mobile computing device as claimed in claim 44, further comprising a data communications interface and wherein in calculating the one or more remedies, the processor is controlled by the computer program code to send the diagnosis data to a server via the data communications Interface and receive back from the server, the one or more remedies.

52. A mobile computing device as claimed in claim 1, wherein the one or more sensors is two or more sensors and the processor is further controlled by the computer program code to calculate the diagnosis in accordance with environment data received from at least two sensors of the two or more sensors.

53. A mobile computing device as claimed in claim 1, wherein the one or more sensors is two or more sensors and the processor is further controlled by the computer program code to calculate the diagnosis in accordance with environment data received from a threshold one or more sensors of the two or more sensors.

54. A mobile computing device as claimed in claim 1, wherein the one or more sensors is two or more sensors and the processor is further controlled by the computer program code to calculate the diagnosis in accordance with a weighting of the environment data according to which sensor it is received from.
55. A mobile computing device as claimed in claim 1, wherein the augmented reality display devices is a pair of glasses and the at least one of the one or more sensors is located at a region selected from the following set of regions of the glasses in relation to a wearer of the glasses:

(i) the bridge of the nose

(ii) the forehead

(iii) a temple; and

(iv) above an ear.

(v) behind an ear

(vi) adjacent an opening of the ear; and

(vii) Inside an ear canal.

56. An application server for calculating vitality indicia data, the application server comprising:

- a processor for processing digital data;
- a memory device for storing digital data including computer program code and being coupled to the processor;
- a data interface for sending and receiving data across a data network and being coupled to the processor wherein the processor is controlled by the computer program code to:

receive, via the data interface, environment input data.

calculate the vitality indicia data in accordance with the environment input data, the vitality indicia data being adapted for display by an augmented reality display device, and

send, via the data interface the vitality indicia data to an augmented reality display device.
57. An application server as claimed in claim 56, wherein the environment input data comprises image data.

58. An application server as claimed in claim 57, wherein, in calculating the vitality Indicia, the processor is further controlled by the computer program code to calculate the vitality Indicia data in accordance with an image recognition technique applied to the image data.

59. An application server as claimed in claim 58, wherein the image recognition technique is adapted for recognising an object.

60. An application server as claimed in claim 59, wherein the object is a meal and wherein the processor is controlled by the computer program code to:

calculate the nutritional composition of the meal; and

calculate the vitality indicia in accordance with the nutritional composition.

61. An application server as claimed in claim 60, wherein the processor is further controlled by the computer program code to calculate nutritional deficiency in accordance with the nutritional composition.

82. An application server as claimed in claim 61, wherein the vitality Indicia data comprises a meal suggestion or plan and the processor is further controlled by the computer program code to calculate the meal suggestion or plan in accordance with the nutritional deficiency.

63. An application server as claimed in claim 58, wherein the image recognition technique is adapted for recognising an action of a person.

64. An application server as claimed in claim 53, wherein the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

65. An application server as claimed in claim 63, wherein the action represents compliance with a treatment regime.
66. An application server as claimed in claim 63, wherein the action represents actions selected from the set of actions comprising: coughing, sneezing, wincing and blinking actions.

67. An application server as claimed in claim 56, wherein the vitality Indicia represents a level of awkeness or tiredness.

68. An application server as claimed in claim 56, wherein the processor is controlled by the computer program code to receive, via the data interface, the environment input data from a wearable rearward facing image capture device adapted for capturing image data relating to at least a part of the face of a wearer.

69. An application server as claimed in claim 68, wherein the at least a part of the face of the user is at least a part of an eye of the user and wherein the processor is further controlled by the computer program code to calculating the vitality indicia data in accordance with a characteristic of the eye.

70. An application server as claimed in claim 69, wherein the characteristic of the eye is one characteristic from the following set of characteristics:

(I) redness
(II) swelling; and
(HI) dark ring.

71. An application server as claimed in claim 69, wherein processor is adapted to send, via the data Interface, an Instruction to the augmented reality display device to darken a view-through means of the augmented reality display device in accordance with the vitality indicia data.

72. An application server as claimed in claim 56, wherein the environment input data comprises a temperature reading of a wearer of the augmented reality display device.

73. An application server as claimed in claim 56, wherein the environmental input data comprises audio data.
74. An application server as claimed in claim 73, wherein, in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality Indicia in accordance with an audio recognition technique.

75. An application server as claimed in claim 74, wherein the audio recognition technique is adapted for recognising sounds within the audio data.

78. An application server as claimed in claim 75, wherein the sound is selected from the set of sounds comprising: coughing, hiccupping, sneezing and obstructed airways sounds.

77. An application server as claimed in claim 56, wherein the processor is further controlled by the computer program code to receive, via the data interface, the environment sensor data in the form of data from a stethoscope.

78. An application server as claimed in claim 56, wherein the environmental Input data comprises acceleration data.

79. An application server as claimed in claim 78, wherein, in calculating the vitality Indicia, the processor is further controlled by the computer program code to calculate the vitality Indicia in accordance with a movement recognition technique applied to the acceleration data.

80. An application server as claimed in claim 79, wherein the movement recognition technique comprises recognising a movement.

81. An application server as claimed in claim 80, wherein the movement represents an exercise movement selected from the set of exercise movements comprising walking, talking and running exercise movements.

82. A mobile computing device as claimed in claim 80, wherein the movement comprises at least a vibrational component and the processor is further controlled by the computer program code to diagnose instances of sleep disordered breathing in accordance with the movement.

83. An application server as claimed in claim 82, wherein the environmental Input data further comprises audio data and in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality Indicia in
accordance with an audio recognition technique that is adapted for recognising sleep disordered breathing sounds within the audio data.

84. An application server as claimed in claim 58, wherein the environment Input data comprises orientation data.

85. An application server as claimed in claim 84, wherein, in calculating the vitality indicia, the processor is further controlled by the computer program code to calculate the vitality Indicia in accordance with an orientation recognition technique.

86. An application server as claimed in claim 85, wherein the orientation recognition technique is adapted for recognising an orientation of a wearer of the augmented reality display device in use.

87. An application server as claimed in claim 86, wherein the processor is further controlled by the computer program code to calculate the resting state of a wearer of the augmented reality display device in accordance with the orientation.

88. An application server as claimed in claim 56, wherein the processor is further controlled by the computer program code to send the environment Input data to another mobile computing device.

89. An application server as claimed in claim 56, wherein the processor is further controlled by the computer program code to send the environment input data to another mobile computing device when a wearer of the augmented reality display device of the mobile computing device looks at a wearer of the augmented reality display device of the another mobile computing device.

90. An application server as claimed in claim 56, wherein the processor is further controlled by the computer program code to calculate a vitality category in accordance with the environment input data.

91. An application server as claimed in claim 56, wherein the processor is further controlled by the computer program code to calculate a diagnosis data in accordance with the environment Input data.
92. An application server as claimed in claim 91, wherein the processor is further controlled by the computer program code to calculate one or more appropriate remedies in accordance with the diagnosis data.

93. An application server as claimed in claim 92, wherein the one or more remedies are each a remedy from the following set of remedies:

(i) a medication

(ii) an exercise

(iii) a diet suggestion

(iv) a lifestyle suggestion

(v) a therapy suggestion; and

(vi) a product suggestion.

94. An application server as claimed in claim 92, wherein the vitality indicia comprises the one or more remedies.

95. An application server as claimed in claim 92, adapted to send Instructions to the augmented reality display device to communicate the one or more remedies audibly to the wearer.

96. An application server as claimed in claim 92, wherein the one or more remedies comprise a branded product suggestion.

97. An application server as claimed in claim 92, wherein the one or more remedies is a branded medication remedy.

98. An application server as claimed in claim 91, wherein the environment data comprises at least two types of environment data and wherein the processor is further controlled by the computer program code to calculate the diagnosis in accordance with the at least two types of environment data.

99. An application server as claimed in claim 98, further adapted to calculate the diagnosis in accordance with a threshold number of types of environment data.
100. An application server as claimed in claim 98, wherein the application server is further adapted to calculate the diagnosis in accordance with a weighting of the types of environment data.

101. A computer readable storage medium for calculating a vitality Indicia, the computer readable storage medium having computer program code instructions recorded thereon, the computer program code instructions being executable by a computer and comprising:

Instructions for receiving environment input data from one or more sensors;

Instructions for calculating the vitality Indicia in accordance with the environment input data, and

Instructions for displaying, using an augmented reality display device, the vitality Indicia.

102. A computer readable storage medium as claimed in claim 101, wherein the environment input data comprises image data.

103. A computer readable storage medium as claimed in claim 102, further comprising Instructions for calculating the vitality Indicia in accordance with an image recognition technique applied to the image data.

104. A computer readable storage medium as claimed in claim 103, wherein the image recognition technique is adapted for recognising an object.

105. A computer readable storage medium as claimed in claim 104, wherein the object is a meal and further comprising Instructions for:

Instructions for calculating the nutritional composition of the meal; and

Instructions for calculating the vitality indicia in accordance with the nutritional composition.

200. A computer readable storage medium as claimed in claim 105, further comprising Instructions for calculating nutritional deficiency in accordance with the nutritional composition.
107. A computer readable storage medium as claimed in claim 106, wherein the vitality indicia comprises a meal suggestion or plan and the computer readable storage medium further comprises instructions for calculating the meal suggestion or plan in accordance with the nutritional deficiency.

108. A computer readable storage medium as claimed in claim 103, wherein the image recognition technique is adapted for recognising an action of a person.

109. A computer readable storage medium as claimed in claim 108, wherein the person is a wearer of the computer readable storage medium.

110. A computer readable storage medium as claimed in claim 109, wherein the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

111. A computer readable storage medium as claimed in claim 110, wherein the action represents compliance with a treatment regime.

112. A computer readable storage medium as claimed in claim 108, wherein the action represents actions selected from the set of actions comprising: coughing, sneezing, wincing and blinking actions.

113. A computer readable storage medium as claimed in claim 101, wherein the vitality indicia represents a level of awareness or tiredness.

114. A computer readable storage medium as claimed in claim 113, further comprising instructions for receiving data from a rearward facing image capture device adapted for capturing image data relating to at least a part of the face of the wearer of the augmented reality display device.

115. A computer readable storage medium as claimed in claim 114, wherein the at least a part of the face of the user is at least a part of an eye of the user and wherein the computer readable storage medium further comprises instructions for calculating the vitality indicia in accordance with a characteristic of the eye.

116. A computer readable storage medium as claimed in claim 115, wherein the characteristic of the eye is one characteristic from the following set of characteristics:
(i) redness

(ii) swelling; and

(iii) dark ring.

117. A computer readable storage medium as claimed in claim 101, wherein the augmented reality display device comprises a view-through means and a transparency control means, the view-through means comprising at least a portion having a transparency that can be adjusted by the transparency control means, and the computer readable storage medium comprises Instructions for the control means to darken the at least a portion of the view-through means in accordance with the vitality Indicia.

118. A computer readable storage medium as claimed in claim 101, wherein the environment Input data is temperature data of a wearer of the augmented reality device.

119. A computer readable storage medium as claimed in claim 101, wherein the environmental Input data comprises audio data.

120. A computer readable storage medium as claimed in claim 119, further comprising Instructions for calculating the vitality Indicia in accordance with an audio recognition technique.

121. A computer readable storage medium as claimed in claim 120, wherein the audio recognition technique is adapted for recognising sounds from within the audio data.

122. A computer readable storage medium as claimed in claim 121, wherein the sound is selected from the set of sounds comprising: coughing, hiccupping, sneezing and obstructed airways sounds.

123. A computer readable storage medium as claimed in claim 101, wherein the environment data comprises data received from a stethoscope.

124. A computer readable storage medium as claimed in claim 101, wherein the environmental Input data comprises acceleration data.
125. A computer readable storage medium as claimed in claim 124, further comprising Instructions for calculating the vitality Indicia in accordance with a movement recognition technique.

126. A computer readable storage medium as claimed in claim 125, wherein the movement recognition technique comprises recognising a movement.

127. A computer readable storage medium as claimed in claim 126, wherein the movement represents an exercise movement selected from the set of exercise movements comprising walking, talking and running exercise movements.

128. A computer readable storage medium as claimed in claim 126, wherein the movement comprises at least a vibrational component and the computer readable storage medium further comprises instructions to diagnose Instances of sleep disordered breathing in accordance with the movement.

129. A computer readable storage medium as claimed in claim 126, wherein the environmental input data further comprises audio data and in calculating the vitality Indicia, the computer readable storage medium further comprises Instructions to calculate the vitality Indicia in accordance with an audio recognition technique that is adapted for recognising sleep disordered breathing sounds within the audio data.

130. A computer readable storage medium as claimed in claim 101, wherein the environment input data comprises orientation data

131. A computer readable storage medium as claimed in claim 130, further comprising Instructions for calculating the vitality Indicia in accordance with an orientation recognition technique.

132. A computer readable storage medium as claimed in claim 131, wherein the orientation recognition technique is adapted for recognising an orientation of a wearer of the augmented reality display device in use.

133. A computer readable storage medium as claimed in claim 132, further comprising Instructions for calculating the resting state of a wearer of the augmented reality display device in accordance with the orientation.
134. A computer readable storage medium as claimed in claim 101, further comprising Instructions for sending, via a data interface, the environment input data.

135. A computer readable storage medium as claimed in claim 101, further comprising Instructions for sending the environment input data to an application server.

136. A computer readable storage medium as claimed in claim 101, wherein the computer readable storage medium comprises further Instructions to send the environment input data to another mobile computing device.

137. A computer readable storage medium as claimed in claim 136, wherein the computer readable storage medium further comprises Instructions to send the environment input data to another mobile computing device when a wearer of the augmented reality display device of the mobile computing device looks at a wearer of the augmented reality display device of the another mobile computing device.

138. A computer readable storage medium as claimed in claim 101, further comprising Instructions for receiving vitality Indicia data representing the vitality Indicia.

139. A computer readable storage medium as claimed in claim 138, further comprising Instructions for receiving the vitality Indicia data from an application server.

140. A computer readable storage medium as claimed in claim 101, further comprising Instructions to receive other environment input data from another mobile computing device and to calculate the vitality indicia further in accordance with the other environment input data.

141. A computer readable storage medium as claimed in claim 101, further comprising Instructions for calculating a vitality category in accordance with the environment input data.

142. A computer readable storage medium as claimed in claim 101, further comprising Instructions for calculating a diagnosis in accordance with the environment input data.
143. A computer readable storage medium as claimed in claim 142, comprising
instructions for calculating one or more appropriate remedies in accordance with the
diagnosis data.

144. A computer readable storage medium as claimed in claim 143, wherein the
one or more remedies are each a remedy from the following set of remedies:

(i) a medication

(ii) an exercise

(iii) a diet suggestion

(iv) a lifestyle suggestion

(v) a therapy suggestion; and

(vi) a product suggestion

145. A computer readable storage medium as claimed in claim 143, wherein the
vitality Indicia comprises the one or more remedies.

146. A computer readable storage medium as claimed in claim 143, further
comprising Instructions to communicate the one or more remedies to a user of the
augmented reality device audibly.

147. A computer readable storage medium as claimed in claim 143, wherein the
one or more remedies comprise a branded product suggestion.

148. A computer readable storage medium as claimed in claim 143, wherein the
one or more remedies is a branded medication remedy.

149. A computer readable storage medium as claimed in claim 142, further
comprising Instructions to send the environment input data to a server and receive
back from the server, the diagnosis data.

150. A computer readable storage medium as claimed in claim 143, further
comprising Instructions to send the diagnosis data to a server and receive back from
the server the one or more remedies.
151. A computer readable storage medium as claimed in claim 142, wherein the environment data comprises at least two types of environment data and the computer readable storage medium further comprises instructions to calculate the diagnosis in accordance with the at least two types of environment data.

152. A computer readable storage medium as claimed in claim 151, further comprising instructions to calculate the diagnosis in accordance with a threshold number of types of environment data.

153. A computer readable storage medium as claimed in claim 151, further comprising instructions to calculate the diagnosis in accordance with a weighting of the types of environment data.

154. A system for calculating a vitality indicia, the system comprising:

- a wearable device; and

- an application server wherein:

  the application server is adapted to receive environment input data from the wearable device,

  the application server is adapted to calculate the vitality indicia in accordance with the environment input data, and

  the application server is adapted to send vitality indicia data representing the vitality indicia to the wearable device.

155. A system as claimed in 154, wherein the wearable device comprises a display device, and wherein the wearable device is adapted to display the vitality indicia data.

155. A system as claimed in 155, wherein the wearable display device is an augmented reality display device.

157. A system as claimed in 156, wherein the vitality indicia data is adapted for display in segmented reality by the augmented reality display device.

158. A system as claimed in claim 154, wherein the environment input data comprises Image data.
159. A system as claimed in claim 158, wherein, in calculating the vitality Indicia, the application server is adapted to calculate the vitality indicia in accordance with an image recognition technique applied to the image data.

160. A system as claimed in claim 159, wherein the image recognition technique is adapted for recognising an object.

161. A system as claimed in claim 160, wherein the object is a meal and wherein the application server is further adapted to:

calculate the nutritional composition of the meal; and

calculate the vitality indicia in accordance with the nutritional composition.

162. A system as claimed in claim 161, wherein the application server is adapted to calculate nutritional deficiency in accordance with the nutritional composition.

163. A system as claimed in claim 162, wherein the application server is adapted to calculate a meal suggestion or plan in accordance with the nutritional deficiency.

164. A system as claimed in claim 159, wherein the image recognition technique is adapted for recognising an action of a person wearing the wearable device.

165. A system as claimed in claim 164, wherein the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

166. A system as claimed in claim 165, wherein the action represents compliance with a treatment regime.

167. A system as claimed in claim 164, wherein the action represents actions selected from the set of actions comprising: coughing, sneezing, wincing and blinking actions.

168. A system as claimed in claim 154, wherein the vitality Indicia represents a level of awakendess or tiredness.

169. A system as claimed in claim 154, wherein the wearable device comprises a rearward facing image capture device adapted for capturing image data relating to at least a part of the face of a wearer.
170. A system as claimed in claim 169, wherein the at least a part of the face of the user is at least a part of an eye of the wearer and wherein the server calculates the vitality Indicia in accordance with a characteristic of the eye.

171. A system as claimed in claim 170, wherein the characteristic of the eye is one characteristic from the following set of characteristics:

(i) redness

(ii) swelling: and

(iii) dark ring.

172. A system as claimed in claim 154, wherein the wearable device comprises a view-through means and a transparency control means, the view-through means comprising at least a portion having a transparency that can be adjusted by the transparency control means, and the server controls the control means to darken the at least a portion of the view-through means in accordance with the vitality indicia.

173. A system as claimed in claim 154, wherein the wearable device comprises at least one temperature sensor and the environmental input data comprises temperature data received from the at least one temperature sensor.

174. A system as claimed in claim 154, wherein the environmental input data comprises audio data.

175. A system as claimed in claim 174, wherein, in calculating the vitality Indicia, the application server is adapted to calculate the vitality indicia in accordance with an audio recognition technique.

176. A system as claimed in claim 175, wherein the audio recognition technique is adapted for recognising sounds within the audio data.

177. A system as claimed in claim 176, wherein the sound is selected from the set of sounds comprising: coughing, hiccupping, sneezing and obstructed airways sounds.
178. A system as claimed in claim 154, wherein the wearable device further comprises a stethoscope interface is adapted for receiving the audio data from a stethoscope in use.

179. A system as claimed in claim 154, wherein the environmental input data comprises acceleration data.

180. A system as claimed in claim 179, wherein, in calculating the vitality indicia, the application server is adapted to calculate the vitality indicia in accordance with a movement recognition technique applied to the acceleration data.

181. A system as claimed in claim 180, wherein the movement recognition technique comprises recognising a movement.

182. A system as claimed in claim 181, wherein the movement represents an exercise movement selected from the set of exercise movements comprising walking, talking and running exercise movements.

183. A system as claimed in claim 181, wherein the movement comprises at least a vibrational component and the server is adapted to diagnose instances of sleep disordered breathing in accordance with the movement.

184. A system as claimed in claim 183, wherein the environmental input data further comprises audio data and in calculating the vitality indicia, the server is adapted to calculate the vitality indicia in accordance with an audio recognition technique that is, in turn, adapted for recognising sleep disordered breathing sounds within the audio data.

185. A system as claimed in claim 154, wherein the environmental input data comprises orientation data.

186. A system as claimed in claim 185, wherein, in calculating the vitality indicia, the application server is adapted to calculate the vitality indicia in accordance with an orientation recognition technique.

187. A system as claimed in claim 186, wherein the orientation recognition technique is adapted for recognising an orientation of a wearer in use.
188. A system as claimed in claim 187, wherein the application server is adapted to calculate the resting state of a wearer of the application server in accordance with the orientation.

189. A system as claimed in claim 154, wherein the server is adapted to send the environment input data to another wearable device.

190. A system as claimed in claim 189, wherein the server is adapted to send the environment input data to another wearable device when a wearer of the wearable device of the mobile computing device looks at a wearer of the another wearable device.

191. A system as claimed in claim 154, wherein the server is further adapted to receive other environment input data from another wearable device and to calculate the vitality Indicia further in accordance with the other environment input data.

192. A system as claimed in claim 154, wherein the server is further adapted to calculate a vitality category in accordance with the environment input data.

193. A system as claimed in claim 154, wherein the server is further adapted to calculate a diagnosis data in accordance with the environment input data.

194. A system as claimed in claim 193, wherein the server is further adapted to calculate one or more appropriate remedies in accordance with the diagnosis data.

195. A system as claimed in claim 194, wherein the one or more remedies are each a remedy from the following set of remedies:

(i) a medication

(ii) an exercise

(iii) a diet suggestion

(iv) a lifestyle suggestion

(v) a therapy suggestion; and

(vi) a product suggestion
196. A system as claimed in claim 194, wherein the vitality indicia comprises the one or more remedies.

197. A system as claimed in claim 194, wherein the one or more remedies are communicated to a wearer of the wearable device audibly.

198. A system as claimed in claim 194, wherein the one or more remedies comprise a branded product suggestion.

199. A system as claimed in claim 194, wherein the one or more remedies is a branded medication remedy.

200. A system as claimed in claim 193, wherein the environment data comprises at least two types of environment data and wherein the server is adapted to calculate the diagnosis in accordance with the at least two types of environment data.

201. A system as claimed in claim 200, wherein the application server is further adapted to calculate the diagnosis in accordance with a threshold number of types of environment data.

202. A system as claimed in claim 200, wherein the application server is further adapted to calculate the diagnosis in accordance with a weighting of the types of environment data.

203. A system as claimed in claim 154, wherein the wearable device is a pair of augmented reality glasses comprising one or more sensors and at least one of the one or more sensors is located at a region selected from the following set of regions of the glasses in relation to a wearer of the glasses:

(i) the bridge of the nose
(ii) the forehead
(iii) a temple
(iv) above an ear
(v) behind an ear
(vi) adjacent an opening of the ear; and
204. A mobile computing device for calculating vitality Indicia, the mobile computing device comprising:

a processor for processing digital data;

5 a memory device for storing digital data including computer program code and being coupled to the processor;

an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor;

at least one sensors for capturing sensor Input data and being coupled to the processor, wherein the processor is controlled by the computer program code to:

receive, from the at least one sensor, the sensor Input data,

calculate the vitality indicia in accordance with the sensor input data, and

display, using the augmented reality display device, the vitality Indicia.

205. A mobile computing device as claimed in claim 204, further comprising a user Interface for sending and receiving user Input data via the augmented reality device, the user interface being coupled to the processor, wherein the processor is controlled by the computer program code to calculate the vitality Indicia in accordance with at least the user input data.

206. A mobile computing device as claimed in claim 204, wherein the processor is controlled by the computer program code to calculate first body posture data representing a first body posture in accordance with the sensor input data and wherein the processor is controlled by the computer program code to calculate the vitality Indicia in accordance with the first body posture data.

207. A mobile computing device as claimed in claim 206, wherein the processor is controlled by the computer program code to calculate second body posture data representing a second body posture in accordance with the sensor input data and wherein the processor is controlled by the computer program code to calculate the vitality Indicia further in accordance the second body posture data.
208. A mobile computing device as claimed in claim 206, wherein the at least one sensor comprises an image capture device and wherein the processor is controlled by the computer program code to calculate the first posture data further in accordance with image data from the image capture device.

209. A mobile computing device as claimed in claim 206, wherein the image capture device is a stereoscopic image capture device and wherein the processor is controlled by the computer program code to calculate the first body posture further in accordance with stereoscopic image data from the stereoscopic image capture device.

210. A mobile computing device as claimed in claim 206, wherein the at least one sensor comprises an orientation sensor adapted for generating orientation data and wherein the processor is further controlled by the computer program code to calculate the first posture data further in accordance with orientation data.

211. A mobile computing device as claimed in claim 200, wherein the processor is further controlled by the computer program code to calculate if the first body posture exceeds a posture range threshold.

212. A mobile computing device as claimed in claim 211, wherein the posture range threshold represents a height range threshold.

213. A mobile computing device as claimed in claim 211, wherein the posture range threshold represents an angular range threshold.

214. A mobile computing device as claimed in claim 200, wherein, in calculating a first body posture, the processor is controlled by the computer program code to calculate reference point data representing a reference point using the image data and calculate the first body posture further in accordance with the reference point data.

215. A mobile computing device as claimed in claim 214, further comprising a user Input Interface for receiving user Input data, and wherein the processor is controlled by the computer program code to receive, via the user Input device, reference point data representing a reference point and calculate the first body posture further in accordance with the reference point data.
216. A mobile computing device as claimed in claim 215, wherein the processor is controlled by the computer program code to calculate distance data representing a distance from the reference point in accordance with the reference point data.

217. A mobile computing device as claimed in claim 208, wherein the processor is further controlled by the computer program code to display, using the augmented reality display device, the first posture data.

218. A mobile computing device as claimed in claim 206, wherein the processor is further controlled by the computer program code to calculate remedial action data representing a remedial action in accordance with the first posture data.

219. A mobile computing device as claimed in claim 204, wherein at least one sensor comprises a rearward facing image capture device adapted for capturing image data representing at least a part of the face of the wearer.

220. A mobile computing device as claimed in claim 219, wherein the at least a part of the face of the wearer is at least a part of an eye of the wearer.

221. A mobile computing device as claimed in claim 220, wherein the processor is controlled by the computer program code to calculate eye characteristic data representing an eye characteristic and calculate the vitality Indicia further in accordance with the eye characteristic.

222. A mobile computing device as claimed in claim 221, wherein the eye characteristic is selected from the set of eye characteristics comprising
   i. redness;
   ii. swelling;
   iii. dark ring;
   iv. iris colour;
   v. pupil symmetry; and
   vi. pupil size eye characteristics.
223. A mobile computing device as claimed in claim 221, wherein the processor is further controlled by the computer program code to calculate the eye characteristic data in accordance with a colour recognition technique.

224. A mobile computing device as claimed in claim 221, wherein the processor is further controlled by the computer program code to calculate the eye characteristic data in accordance with a movement recognition technique.

225. A mobile computing device as claimed in claim 221, wherein the processor is further controlled by the computer program code to calculate further eye characteristic data representing a further eye characteristic and calculate the vitality Indicia further in accordance with the further eye characteristic.

226. A mobile computing device as claimed in claim 221, wherein the processor is further controlled by the computer program code to compare the eye characteristic data against normal eye characteristic data representing a normal eye characteristic.

227. A mobile computing device as claimed in claim 225, wherein the eye characteristic data represents a pupil dilation state and wherein the at least one sensor further comprises an ambient light meter and wherein the processor is further controlled by the computer program code to receive, from the ambient light meter, ambient light data representing an ambient lighting level, and calculate the vitality Indicia further in accordance with the ambient light data and the pupil dilation state.

228. A mobile computing device as claimed in claim 227, wherein the further eye characteristic data represents a second pupil dilation state and wherein the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the second pupil dilation state.

229. A mobile computing device as claimed in claim 228, wherein the processor is further controlled by the computer program code to receive, from the ambient light meter, further ambient light data representing a further ambient light level, and calculate the vitality Indicate further in accordance with the further ambient light data.

230. A mobile computing device as claimed in claim 204, wherein at least one sensor comprises an audio sensor, and wherein the processor is further controlled by the computer program code to receive, from the audio sensor, audio data
representing a voice command and calculate, using audio recognition technique, a command in accordance with the audio data.

231. A mobile computing device as claimed in claim 230, wherein the processor is further controlled by the computer program code to calculate the vitality Indicia.

232. A mobile computing device as claimed in claim 231, further comprising user Interface output being coupled to the processor for outputting user data and wherein the processor is further controlled by the computer program code to calculate prompt data representing a prompt and output, using the user interface output, the prompt data.

233. A mobile computing device as claimed in claim 232, wherein the processor is further controlled by the computer program code to calculate the vitality indicia.

234. A mobile computing device as claimed in claim 233, wherein the processor is further controlled by the computer program code to calculate further prompt data representing a further prompt in accordance with the command and output, using the user Interface output, the further prompt data.

235. A mobile computing device as claimed in claim 234, wherein the processor is further controlled by the computer program code to calculate the vitality indicia.

238. A mobile computing device as claimed in claim 230, wherein the processor is further controlled by the computer program code to receive, from the audio sensor, further audio data representing a further voice command and calculate, using audio recognition technique, a further command in accordance with the further audio data.

237. A mobile computing device as claimed in claim 236, wherein the processor is further controlled by the computer program code to calculate the vitality indicia.

238. A mobile computing device as claimed in claim 230, wherein the processor is further controlled by the computer program code to calculate disease process data representing a disease in accordance with the vitality Indicia.
239. A mobile computing device as claimed in claim 204, wherein the processor is further controlled by the computer program code to receive, from the at least one sensor, further sensor Input data and calculate the vitality indicia further in accordance with the further sensor Input data.

240. A mobile computing device as claimed in claim 239, wherein the processor is further controlled by the computer program code to select remedy data representing a remedy in accordance with the sensor input data and the further sensor input data.

241. A mobile computing device as claimed in claim 240, wherein the remedy is selected from the set of remedies comprising medication, exercise activity, diet suggestion, lifestyle suggestion, therapy suggestion and product suggestion remedies.

242. A mobile computing device as claimed in claim 240, wherein the processor is further controlled by the computer program code to calculate remedy effectiveness data representing an effectiveness of the remedy in accordance with the further sensor Input data.

243. A mobile computing device as claimed in claim 240, further comprising a data Interface for sending and receiving data across a data network, the data Interface being coupled to the processor, wherein the processor is controlled by the computer program code to send, via the data Interface, the remedy data.

244. A mobile computing device as claimed in claim 204, further comprising a data Interface for sending and receiving data across a data network, the data Interface being coupled to the processor, wherein the processor is further controlled by the computer program code to send, via the data Interface, emergency data representing an emergency in accordance with the vitality indicia.

245. A mobile computing device as claimed in claim 244, wherein the at least one sensor is adapted to monitor blood oxygen saturation.

240. A mobile computing device as claimed in claim 244, wherein the at least one sensor is adapted to monitor a breathing rate.
247. A mobile computing device as claimed in claim 244, wherein the at least one sensor is adapted to monitor a heart rate.

248. A mobile computing device as claimed in claim 244, wherein the at least one sensor is adapted to monitor a temperature.

249. A mobile computing device as claimed in claim 244, further comprising a location sensing means for sensing a location, the location sensing means being coupled to the processor, wherein the processor is further controlled by the computer program code to receive, from the location sensing means, location data representing a location, and send, via the date interface, the location data.

250. A mobile computing device as claimed in claim 244, wherein the processor is further controlled by the computer program code to select emergency contact data further in accordance with the vitality Indicia.

251. A mobile computing device as claimed in claim 249, wherein the processor is further controlled by the computer program code to select a proximate mobile computing device and send, via the date interface, to the proximate mobile computing device the emergency data.

252. A mobile computing device as claimed in claim 204, wherein the processor is controlled by the computer program code to display, using the augmented reality display device, medical assistance instructions.

253. A mobile computing device as claimed in claim 204, wherein the vitality indicia represents the wearers stress level.

254. A mobile computing device as claimed in claim 253, wherein the at least one sensor is adapted to capture sensor input data selected from the set of sensor input data comprising:

i. blood oxygen saturation;

ii. breathing rate;

iii. body temperature;

iv. heart rate data; and
v. perspiration level sensor input data.

255. A mobile computing device as claimed in claim 253, wherein the processor is controlled by the computer program code to display the wearer’s stress level on the augmented reality display in a real-time graphical format.

256. A mobile computing device for detecting an environmental hazard, the mobile computing device comprising:

a processor for processing digital data;

a memory device for storing digital data including computer program code and being coupled to the processor;

an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor;

at least one sensors for capturing sensor input data and being coupled to the processor, wherein the processor is controlled by the computer program code to:

receive, from the at least one sensor, the sensor input data,

detecting an environmental hazard with the sensor input data, and

display, using the augmented reality display device, the environmental hazard.

257. A mobile computing device as claimed in claim 256, wherein the at least one sensor is an image capture device adapted for capturing image data, and wherein the processor is controlled by the computer program code to calculate the vitality Indicia in accordance with an image recognition technique and the image data.

258. A mobile computing device as claimed in claim 257, wherein the processor is further controlled by the computer program code to recognise an object.

259. A mobile computing device as claimed in claim 258, wherein the processor is further controlled by the computer program code to calculate whether the object is hazardous.

260. A mobile computing device as claimed in claim 256, wherein the Image recognition technique comprises text recognition technique.
261. A mobile computing device as claimed in claim 260, wherein the processor is further controlled by the computer program code to recognise text.

262. A mobile computing device as claimed in claim 261, wherein the processor is further controlled by the computer program code to calculate whether the text represents a hazardous substance.

263. A mobile computing device as claimed in claim 256, further comprising a data interface for sending and receiving data across a data network and being coupled to the processor, and wherein the processor is further controlled by the computer program code, to send the text to a hazardous substance lookup service.

264. A mobile computing device as claimed in claim 256, wherein the at least one sensor is a radiation measurement device adapted for generating radiation level data representing a radiation level, and wherein the processor is further controlled by the computer program code to detect the environmental hazard further in accordance with the radiation level data.

265. A mobile computing device as claimed in claim 204, wherein the radiation measurement device is a UV radiation measurement device.

266. A mobile computing device as claimed in claim 256, wherein the processor is further controlled by the computer program code to calculate radiation exposure data representing radiation exposure in accordance with the radiation level data and detect the environmental hazard further in accordance with the radiation exposure data.

267. A mobile computing device for vision assistance, the mobile computing device comprising:

a processor for processing digital data;

a memory device for storing digital data including computer program code and being coupled to the processor;

an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor,
at least one sensor for capturing sensor input data and being coupled to the processor, wherein the processor is **controlled** by the computer program code to:

receive, from the at least one sensor, the sensor input data,

calculate augmented image data representing an augmented image in accordance with the sensor input data and a medical condition, and

display, using the augmented reality display device, the augmented image.

268. A mobile computing device as claimed in claim 267, wherein at least one sensor comprises a rearward facing image capture device adapted for capturing image data representing at least a part of the face of a wearer.

269. A mobile computing device as claimed in claim 268, wherein the at least a part of the face of the wearer is at least a part of an eye of the wearer.

270. A mobile computing device as claimed in claim 269, wherein the processor is further controlled by the computer program code to calculate orientation data representing an orientation of the eye in accordance with the image data and calculate the augmented image data further in accordance with the orientation data.

271. A mobile computing device as claimed in claim 276, wherein the processor is further controlled by the computer program code to calculate a field of view data representing a field of view of the wearer in accordance with the orientation data and calculate the augmented image data further in accordance with the field of view data.

272. A mobile computing device as claimed in claim 271, wherein at least one sensor further comprises an forward facing image capture device.

273. A mobile computing device as claimed in claim 272, wherein the processor is further controlled by the computer program code to receive, from the **forward** facing image capture device, view image data representing a view of the wearer and calculate the augmented image data further in accordance with the view image data.

274. A mobile computing device as claimed in claim 267, further comprising a user interface for receiving user input data and being coupled to the processor, wherein the processor is controlled by the computer program code to receive, from the user
Interface, vision abnormality data representing a vision abnormality, and calculate the augmented image data further in accordance with the vision abnormality data.

275. A mobile computing device as claimed in claim 274, wherein the vision abnormality data comprises blind spot data representing a blind spot.

276. A mobile computing device as claimed in claim 275, wherein the processor is further controlled by the computer program code to calculate blind spot image data representing a portion of an image within the wearer's blind spot in accordance with the view image data and the blind spot data.

277. A mobile computing device as claimed in claim 276, wherein the augmented image data comprises a superimposition of the blind spot image data and the view image data.

278. An application server for calculating vitality Indicia, the application server comprising;

a processor for processing digital data;

a memory device for storing digital data including computer program code and being coupled to the processor;

a data interface for sending and receiving data across a data network and being coupled to the processor, wherein the processor is controlled by the computer program code to:

receive, from the data interface, sensor input data,

calculate the vitality Indicia in accordance with the sensor input data, and

send, via the data interface, the vitality Indicia.

279. An application server as claimed in claim 278, wherein the processor is controlled by the computer program code to:

receive, from the data interface, user input interface data representing user input, and

calculate the vitality indicia in accordance with at least the user input data.
280. An application server as claimed in claim 278, wherein the processor is controlled by the computer program code to calculate first body posture data representing a first body posture in accordance with the sensor input data and wherein the processor is controlled by the computer program code to calculate the vitality Indicia in accordance with the first body posture data.

281. An application server as claimed in claim 280, wherein the processor is controlled by the computer program code to calculate second body posture data representing a second body posture in accordance with the sensor input data and wherein the processor is controlled by the computer program code to calculate the vitality Indicia further in accordance the second body posture data.

282. An application server as claimed in claim 280, wherein the sensor data represents image data and wherein the processor is controlled by the computer program code to calculate the first posture data further in accordance with the image data.

283. An application server as claimed in claim 282, wherein the image data is stereoscopic image data and wherein the processor is controlled by the computer program code to calculate the first body posture further in accordance with the stereoscopic image data.

284. An application server as claimed in claim 280, wherein the sensor input data represents orientation data and wherein the processor is further controlled by the computer program code to calculate the first posture data further in accordance with the orientation data.

285. An application server as claimed in claim 280, wherein the processor is further controlled by the computer program code to calculate if the a first body posture exceeds a posture range threshold.

288. An application server as claimed in claim 285, wherein the posture range threshold represents a height range threshold.

287. An application server as claimed in claim 285, wherein the posture range threshold represents an angular range threshold.
288. An application server as claimed in claim 280, wherein, in calculating a first body posture, the processor is controlled by the computer program code to calculate reference point data representing a reference point using the Image data and calculate the first body posture further in accordance with the reference point data.

289. An application server as claimed in claim 288, wherein the processor is controlled by the computer program code to receive, via the data interface, reference point data representing a reference point and calculate the first body posture further in accordance with the reference point data.

290. An application server as claimed in claim 289, wherein the processor is controlled by the computer program code to calculate distance data representing a distance from the reference point in accordance with the reference point data.

291. An application server as claimed in claim 280, wherein the processor is further controlled by the computer program code to send, via the data interface, the first posture data.

292. An application server as claimed in claim 280, wherein the processor is further controlled by the computer program code to calculate remedial action data representing a remedial action in accordance with the first posture data.

293. An application server as claimed in claim 278, wherein the sensor input data represents image data representing at least a part of the face of the wearer.

294. An application server as claimed in claim 293, wherein the at least a part of the face of the wearer is at least a part of an eye of the wearer.

295. An application server as claimed in claim 294, wherein the processor is controlled by the computer program code to calculate eye characteristic data representing an eye characteristic and calculate the vitality Indicia further in accordance with the eye characteristic.

296. An application server as claimed in claim 295, wherein the eye characteristic is selected from the set of eye characteristics comprising

   i. redness;

   ii. swelling;
iii. dark ring;
iv. Iris colour;
v. pupil symmetry; and
vi. pupil size eye characteristics.

297. An application server as claimed in claim 295, wherein the processor is further controlled by the computer program code to calculate the eye characteristic data in accordance with a colour recognition technique.

298. An application server as claimed in claim 295, wherein the processor is further controlled by the computer program code to calculate the eye characteristic data in accordance with a movement recognition technique.

299. An application server as claimed in claim 295, wherein the processor is further controlled by the computer program code to calculate further eye characteristic data representing a further eye characteristic and calculate the vitality indicia further in accordance with the further eye characteristic.

309. An application server as claimed in claim 295, wherein the processor is further controlled by the computer program code to compare the eye characteristic data against normal eye characteristic data representing a normal eye characteristic.

391. An application server as claimed in claim 299, wherein the eye characteristic data represents a pupil dilation state and wherein the sensor input data comprises ambient light data representing an ambient lighting level, and wherein the processor is further controlled by the computer program code to calculate the vitality indicia further in accordance with the ambient light data and the pupil dilation state.

392. An application server as claimed in claim 301, wherein the further eye characteristic data represents a second pupil dilation state and wherein the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the second pupil dilation state.

303. An application server as claimed in claim 392, wherein the sensor input data further comprises further ambient light data representing a further ambient light level,
and wherein the processor is further controlled by the computer program code to calculate the vitality indicate further in accordance with the further ambient light data.

304. An application server as claimed in claim 278, wherein the sensor input data comprises audio data representing a voice command and wherein the processor is further controlled by the computer program code to calculate, using audio recognition technique, a command in accordance with the audio data.

305. An application server as claimed in claim 304, wherein the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the command.

306. An application server as claimed in claim 305, wherein the processor is further controlled by the computer program code to receive, via the data interface, user input interface data representing user input using a user interface and wherein the processor is further controlled by the computer program code to calculate prompt data representing a prompt and output, using the user interface output, the prompt data.

307. An application server as claimed in claim 306, wherein the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the prompt data.

303. An application server as claimed in claim 307, wherein the processor is further controlled by the computer program code to calculate further prompt data representing a further prompt in accordance with the command and send, via the data interface, the further prompt data.

309. An application server as claimed in claim 303, wherein the processor is further controlled by the computer program code to calculate the vitality indicia further in accordance with the further prompt data.

310. An application server as claimed in claim 304, wherein the sensor input data comprises further audio data representing a further voice command and wherein the processor is further controlled by the computer program code to calculate, using audio recognition technique, a further command in accordance with the further audio data.
311. An application server as claimed in claim 310, wherein the processor is further controlled by the computer program code to calculate the vitality Indicia further in accordance with the further command.

312. An application server as claimed in claim 304, wherein the processor is further controlled by the computer program code to calculate disease process data representing a disease in accordance with the vitality Indicia.

313. An application server as claimed in claim 278, wherein the processor is further controlled by the computer program code to receive, via the data interface, further sensor input data and calculate the vitality Indicia further in accordance with the further sensor input data.

314. An application server as claimed in claim 313, wherein the processor is further controlled by the computer program code to select remedy data representing a remedy in accordance with the sensor input data and the further sensor input data.

315. An application server as claimed in claim 314, wherein the remedy is selected from the set of remedies comprising medication, exercise activity, diet suggestion, lifestyle suggestion, therapy suggestion and product suggestion remedies.

316. An application server as claimed in claim 314, wherein the processor is further controlled by the computer program code to calculate remedy effectiveness data representing an effectiveness of the remedy in accordance with the further sensor input data.

317. An application server as claimed in claim 314, wherein the processor is controlled by the computer program code to send, via the data interface, the remedy data.

318. An application server as claimed in claim 273, wherein the processor is further controlled by the computer program code to send, via the data interface, emergency data representing an emergency in accordance with the vitality Indicia.

319. An application server as claimed in claim 318, wherein the sensor input data represents blood oxygen saturation.
320. An application server as claimed in claim 318, wherein the sensor input data represents a breathing rate.

321. An application server as claimed in claim 318, wherein the sensor input data represents a heart rate.

322. An application server as claimed in claim 318, wherein the sensor input data represents a temperature.

323. An application server as claimed in claim 318, wherein the processor is further controlled by the computer program code to receive, via the data interface, location data representing a location, and send, via the data interface, the location data.

324. An application server as claimed in claim 318, wherein the processor is further controlled by the computer program code to select emergency contact data further in accordance with the vitality indicia.

325. An application server as claimed in claim 325, wherein the processor is further controlled by the computer program code to select a proximate application server and send, via the data interface, to the proximate application server the emergency data.

326. An application server as claimed in claim 278, wherein the processor is controlled by the computer program code to send, using the data interface, medical assistance instructions.

327. An application server as claimed in claim 278, wherein the vitality indicia represents the wearer’s stress level.

323. An application server as claimed in claim 327, wherein the at least one sensor is adapted to capture sensor input data selected from the set of sensor input data comprising:

i. blood oxygen saturation;

ii. breathing rate;

iii. body temperature;

iv. heart rate data; and
perspiration level sensor input data.

329. An application server as claimed in claim 327, wherein the processor is controlled by the computer program code to send, via the date interface, the wearers' stress level.

330. An application server for detecting an environmental hazard, the application server comprising:

- a processor for processing digital data;
- a memory device for storing digital data including computer program code and being coupled to the processor;
- a data interface for sending and receiving data across a data network and being coupled to the processor, wherein the processor is controlled by the computer program code to:
  - receive, via the date interface, sensor input data,
  - detecting an environmental hazard with the sensor input data, and
  - send, via the date interface, environmental hazard data representing the environmental hazard.

331. An application server as claimed in claim 330, wherein the sensor input data comprises image data and wherein the processor is controlled by the computer program code to calculate the vitality indicia in accordance with an image recognition technique and the image data.

332. An application server as claimed in claim 331, wherein the processor is further controlled by the computer program code to recognise an object.

333. An application server as claimed in claim 332, wherein the processor is further controlled by the computer program code to calculate whether the object is hazardous.

334. An application server as claimed in claim 330, wherein the image recognition technique comprises text recognition technique.
335. *An application server as claimed in claim 334.* wherein the processor is further controlled by the computer program code to recognise text.

338. *An application server as claimed in claim 335,* wherein the processor is further controlled by the computer program code to calculate whether the text represents a hazardous substance.

337. *An application server as claimed in claim 330,* wherein the processor is further controlled by the computer program code, to send the text to a hazardous substance lookup service.

338. *An application server as claimed in claim 330,* wherein the sensor input data comprises radiation level data representing a radiation level, and wherein the processor is further controlled by the computer program code to detect the environmental hazard further in accordance with the radiation level data.

339. *An application server as claimed in claim 278,* wherein the radiation measurement data represents a UV radiation measurement.

340. *An application server as claimed in claim 330,* wherein the processor is further controlled by the computer program code to calculate radiation exposure data representing radiation exposure in accordance with the radiation level data and detect the environmental hazard further in accordance with the radiation exposure data.

341. *An application server for vision assistance,* the application server comprising:

a processor for processing digital data;

a memory device for storing digital data including computer program code and being coupled to the processor:

a data interface for sending and receiving data across a data network and being coupled to the processor, wherein the processor is controlled by the computer program code to:

receive, via the date interface, sensor input data,
calculate augmented Image data representing an augmented image in accordance with the sensor input data and a medical condition, and display, using the augmented reality display device, the augmented Image.

342. An application server as claimed in claim 341, wherein the sensor input data comprises Image data representing at least a part of the face of a wearer.

343. An application server as claimed in claim 342, wherein the at least a part of the face of the wearer is at least a part of an eye of the wearer.

344. An application server as claimed in claim 343, wherein the processor is further controlled by the computer program code to calculate orientation data representing an orientation of the eye in accordance with the image data and calculate the augmented image data further in accordance with the orientation data.

345. An application server as claimed in claim 344, wherein the processor is further controlled by the computer program code to calculate a field of view data representing a field of view of the wearer in accordance with the orientation data and calculate the augmented image data further in accordance with the field of view data.

346. An application server as claimed in claim 345, wherein the sensor input data further comprises Image data representing forward facing Image data.

347. An application server as claimed in claim 364, wherein the processor is further controlled by the computer program code to calculate view Image data representing a view of the wearer and calculate the augmented Image data further in accordance with the view Image data.

348. An application server as claimed in claim 348, wherein the processor is further controlled by the computer program code to receive, via the display, vision abnormality data representing a vision abnormality, and calculate the augmented Image data further in accordance with the vision abnormality data.

349. An application server as claimed in claim 343, wherein the vision abnormality data comprises blind spot data representing a blind spot.

350. An application server as claimed in claim 349, wherein the processor is further controlled by the computer program code to calculate blind spot Image data.
representing a portion of an image within the wearer's blind spot in accordance with the view image data and the blind spot data.

351. An application server as claimed in claim 350, wherein the augmented image data comprises a superimposition of the blind spot image data and the view image data.

352. A computer readable storage medium for calculating vitality indicia, the computer readable storage medium comprising computer code Instructions for a computing device and comprising Instructions for:

- receiving, from at least one sensor, the sensor input data,
- calculating vitality Indicia in accordance with the sensor input data, and
- displaying, using a augmented reality displaying device, the vitality Indicia.

353. A computer readable storage medium as claimed in claim 352, further comprising Instructions for calculating the vitality Indicia in accordance with at least the user input data.

354. A computer readable storage medium as claimed in claim 352, further comprising Instructions for calculating first body posture data representing a first body posture in accordance with the sensor input data and further comprising Instructions for calculating the vitality Indicia in accordance with the first body posture data.

355. A computer readable storage medium as claimed in claim 354, further comprising Instructions for calculating second body posture data representing a second body posture in accordance with the sensor input data and further comprising Instructions for calculating the vitality Indicia further in accordance the second body posture data.

356. A computer readable storage medium as claimed in claim 354, further comprising Instructions for calculating the first posture data further in accordance with image data from an image capture device.

357. A computer readable storage medium as claimed in claim 354, wherein the Image capture device is a stereoscopic image capture device and further comprising
Instructions for calculating the first body posture further in accordance with stereoscopic image data from the stereoscopic image capture device.

358. A computer readable storage medium as claimed in claim 354, wherein the at least one sensor comprises an orientation sensor adapted for generating orientation data and further comprising instructions for calculating the first posture data further in accordance with the orientation data.

359. A computer readable storage medium as claimed in claim 354, further comprising Instructions for calculating if the a first body posture exceeds a posture range threshold.

360. A computer readable storage medium as claimed in claim 359, wherein the posture range threshold represents a height range threshold.

361. A computer readable storage medium as claimed in claim 359, wherein the posture range threshold represents an angular range threshold.

362. A computer readable storage medium as claimed in claim 354, further comprising Instructions for calculating reference point data representing a reference point using the mage data and calculating the first body posture further in accordance with the reference point data.

363. A computer readable storage medium as claimed in claim 362, further comprising Instructions for receiving, via a user Input device, reference point date representing a reference point and calculating the first body posture further in accordance with the reference point data.

364. A computer readable storage medium as claimed in claim 363, further comprising Instructions for calculating distance data representing a distance from the reference point in accordance with the reference point data.

365. A computer readable storage medium as claimed in claim 354, further comprising Instructions for displaying, using the augmented reality displaying device, the first posture data.
366. A computer readable storage medium as claimed in claim 354, further comprising instructions for calculating remedial action data representing a remedial action in accordance with the first posture data.

367. A computer readable storage medium as claimed in claim 352, wherein at least one sensor comprises a rearward facing image capture device adapted for capturing image data representing at least a part of the face of the wearer.

368. A computer readable storage medium as claimed in claim 367, wherein at least a part of the face of the wearer is at least a part of an eye of the wearer.

369. A computer readable storage medium as claimed in claim 368, further comprising instructions for calculating eye characteristic data representing an eye characteristic and calculating the vitality indicia further in accordance with the eye characteristic.

370. A computer readable storage medium as claimed in claim 369, wherein the eye characteristic is selected from the set of eye characteristics comprising

i. redness;

ii. swelling;

iii. dark ring;

iv. iris colour;

v. pupil symmetry; and

vi. pupil size eye characteristics.

371. A computer readable storage medium as claimed in claim 369, further comprising instructions for calculating the eye characteristic data in accordance with a colour recognition technique.

372. A computer readable storage medium as claimed in claim 369, further comprising instructions for calculating the eye characteristic data in accordance with a movement recognition technique.
373. A computer readable storage medium as claimed in claim 369, further comprising instructions for calculating further eye characteristic data representing a further eye characteristic and calculating the vitality Indicia further in accordance with the further eye characteristic.

374. A computer readable storage medium as claimed in claim 369, further comprising instructions for calculating further eye characteristic data representing a normal eye characteristic.

375. A computer readable storage medium as claimed in claim 373, wherein the eye characteristic data represents a pupil dilation state and wherein the at least one sensor further comprises an ambient light meter and further comprising instructions for receiving, from the ambient light meter, ambient light data representing an ambient lighting level, and calculating the vitality Indicia further in accordance with the ambient light data and the pupil dilation state.

376. A computer readable storage medium as claimed in claim 375, wherein the further eye characteristic data represents a second pupil dilation state and further comprising instructions for calculating the vitality Indicia further in accordance with the second pupil dilation state.

377. A computer readable storage medium as claimed in claim 376, further comprising instructions for receiving, from the ambient light meter, further ambient light data representing a further ambient light level, and calculating the vitality Indicia further in accordance with the further ambient light data.

378. A computer readable storage medium as claimed in claim 352, wherein at least one sensor comprises an audio sensor, and further comprising instructions for receiving, from the audio sensor, audio data representing a voice command and calculating, using audio recognition technique, a command in accordance with the audio data.

379. A computer readable storage medium as claimed in claim 378, further comprising instructions for calculating the vitality Indicia further in accordance with the command.
380. A computer readable storage medium as claimed in claim 379, further comprising instructions for calculating prompt data representing a prompt and outputting, using a user interface output, the prompt data.

381. A computer readable storage medium as claimed in claim 380, further comprising instructions for calculating the vitality indicia further in accordance with the prompt data.

382. A computer readable storage medium as claimed in claim 331, further comprising instructions for calculating further prompt data representing a further prompt in accordance with the command and outputting, using the user interface output, the further prompt data.

383. A computer readable storage medium as claimed in claim 382, further comprising instructions for calculating the vitality Indicia further in accordance with the further prompt data.

384. A computer readable storage medium as claimed in claim 378, further comprising instructions for receiving, from the audio sensor, further audio data representing a further voice command and calculating, using audio recognition technique, a further command in accordance with the further audio data.

385. A computer readable storage medium as claimed in claim 384, further comprising instructions for calculating the vitality Indicia further in accordance with the further command.

388. A computer readable storage medium as claimed in claim 378, further comprising instructions for calculating disease process data representing a disease in accordance with the vitality Indicia.

387. A computer readable storage medium as claimed in claim 352, further comprising instructions for receiving, from the at least one sensor, further sensor input data and calculating the vitality Indicia further in accordance with the further sensor input data.

388. A computer readable storage medium as claimed in claim 387, further comprising instructions for selecting remedy data representing a remedy in accordance with the sensor input data and the further sensor input data.
389. A computer readable storage medium as **claimed** in claim 388, wherein the remedy is selected from the set of remedies comprising medication, exercise activity, diet suggestion, lifestyle suggestion, therapy suggestion and product suggestion remedies.

390. A computer readable storage medium as claimed in claim 388, further comprising Instructions for calculating remedy effectiveness data representing an effectiveness of the remedy in accordance with the further sensor input data.

391. A computer readable storage medium as claimed in claim 388, further comprising Instructions for sending, via a data Interface, the remedy data.

392. A computer readable storage medium as claimed in claim 352, further comprising Instructions for sending, via a data Interface, emergency data representing an emergency in accordance with the vitality Indicia.

393. A computer readable storage medium as claimed in claim 392, wherein the at least one sensor is adapted to monitor blood oxygen saturation.

394. A computer readable storage medium as claimed in claim 392, wherein the at least one sensor is adapted to monitor a breathing rate.

395. A computer readable storage medium as claimed in claim 392, wherein the at least one sensor is adapted to monitor a heart rate.

396. A computer readable storage medium as claimed in claim 392, wherein the at least one sensor is adapted to monitor a temperature.

397. A computer readable storage medium as claimed in claim 392, further comprising Instructions for receiving, from location sensing means, location data representing a location, and send, via the data Interface, the location data.

398. A computer readable storage medium as claimed in claim 392, further comprising Instructions for selecting emergency contact data further in accordance with the vitality indicia.

399. A computer readable storage medium as claimed in claim 397, further comprising Instructions for selecting a proximate computer readable storage medium
and sending, via the data interface, to the proximate computer readable storage medium the emergency data.

400. A computer readable storage medium as claimed in claim 352, further comprising Instructions for displaying, using the augmented reality displaying device, medical assistance Instructions.

401. A computer readable storage medium as claimed in claim 352, wherein the vitality Indicia represents the wearer's stress level.

402. A computer readable storage medium as claimed in claim 401, wherein the at least one sensor is adapted to capture sensor input data selected from the set of

sensor input data comprising;

i. blood oxygen saturation;

ii. breathing rate;

iii. body temperature;

iv. heart rate data; and

v. perspiration level sensor input data.

403. A computer readable storage medium as claimed in claim 401, further comprising Instructions for displaying the wearer's stress level on the augmented reality displaying in a real-time graphical format.

404. A computer readable storage medium for detecting an environmental hazard the computer readable storage medium comprising computer code instructions for a computing device and comprising Instructions for:

receiving, from at least one sensor, the sensor input data,

detecting an environmental hazard with the sensor input data, and

displaying, using an augmented reality displaying device, the environmental hazard.

405. A computer readable storage medium as claimed in claim 404, wherein the at least one sensor is an image capture device adapted for capturing image data, and
further comprising instructions for calculating the vitality indicia in accordance with an image recognition technique and the image data.

408. A computer readable storage medium as claimed in claim 405, further comprising Instructions for recognising an object.

407. A computer readable storage medium as claimed in claim 408, further comprising Instructions for calculating whether the object is hazardous.

408. A computer readable storage medium as claimed in claim 404, wherein the Image recognition technique comprises text recognition technique.

409. A computer readable storage medium as claimed in claim 408, further comprising Instructions for recognising text.

410. A computer readable storage medium as claimed in claim 409, further comprising Instructions for calculating whether the text represents a hazardous substance.

411. A computer readable storage medium as claimed in claim 404, further comprising instructions for sending the text to a hazardous substance lookup service.

412. A computer readable storage medium as claimed in claim 404, wherein the at least one sensor is a radiation measurement device adapted for generating radiation level data representing a radiation level, and further comprising Instructions for detecting the environmental hazard further in accordance with the radiation level data.

413. A computer readable storage medium as claimed in claim 352, wherein the radiation measurement device is a UV radiation measurement device.

414. A computer readable storage medium as claimed in claim 404, further comprising Instructions for calculating radiation exposure data representing radiation exposure in accordance with the radiation level data and detecting the environmental hazard further in accordance with the radiation exposure data.
415. A computer readable storage medium for vision assistance, the computer readable storage medium comprising computer code instructions for a computing device and comprising instructions for:

receiving, from at least one sensor, the sensor input data,

calculating augmented Image data representing an augmented image in accordance with the sensor input data and a medical condition, and

displaying, using an augmented reality displaying device, the augmented Image.

416. A computer readable storage medium as claimed in claim 415, wherein at least one sensor comprises a rearward facing Image capture device adapted for capturing Image data representing at least a part of the face of a wearer.

417. A computer readable storage medium as claimed in claim 416, wherein the at least a part of the face of the wearer is at least a part of an eye of the wearer.

418. A computer readable storage medium as claimed in claim 417, further comprising instructions for calculating orientation data representing an orientation of the eye in accordance with the image data and calculating the augmented image data further in accordance with the orientation data.

419. A computer readable storage medium as claimed in claim 418, further comprising instructions for calculating a field of view data representing a field of view of the wearer in accordance with the orientation data and calculating the augmented Image data further in accordance with the field of view data.

426. A computer readable storage medium as claimed in claim 419, wherein at least one sensor further comprises a forward facing Image capture device.

421. A computer readable storage medium as claimed in claim 426, further comprising instructions for receiving, from the forward facing Image capture device, view Image data representing a view of the wearer and calculating the augmented Image data further in accordance with the view Image data.

422. A computer readable storage medium as claimed in claim 415, further comprising instructions for receiving, from a user interface, vision abnormality data
representing a vision abnormality, and calculating the augmented image data further in accordance with the vision abnormality data.

423. A computer readable storage medium as claimed in claim 422, wherein the vision abnormality data comprises blind spot data representing a blind spot.

424. A computer readable storage medium as claimed in claim 423, further comprising Instructions for calculating blind spot Image data representing a portion of an image within the wearer's blind spot in accordance with the view image data and the blind spot data.

425. A computer readable storage medium as claimed in claim 424, wherein the augmented image data comprises a superimposition of the blind spot image data and the view image data.

426. A wearable computing device for diagnosing a disease, the wearable computing device comprising:

- a processor for processing digital data;
- a memory device for storing digital data including computer program code and being coupled to the processor; and
- at least one sensor for capturing sensor input data and being coupled to the processor, wherein the processor is controlled by the computer program code to:
  - receive, from the at least one sensor, the sensor input data,
  - calculate, using the sensor input data, the disease in accordance with the sensor input data.

427. A wearable computing device as claimed in claim 426, wherein the disease is an eye disease.

428. A wearable computing device as claimed in claim 427, wherein the least one sensor comprises an image capture device, and wherein the processor is further controlled by the computer program code to:

- receive, via the image capture device, image data representing an image capture of at least a portion of an eye of a wearer; and
- calculate the eye disease in accordance with the image data.

429. A wearable computing device as claimed in claim 428, wherein the at least a portion of the eye of the wearer is the sclera of the eye.
430. A wearable computing device as claimed in claim 429, wherein the processor
is further controlled by the computer program code to calculate the eye disease in
accordance with a colour recognition technique.
431. A wearable computing device as claimed in claim 430, wherein the eye
condition is jaundice.
432. A wearable computing device as claimed in claim 429, wherein the at least a
portion of the eye of the wearer is the iris of the eye.
433. A wearable computing device as claimed in claim 429, wherein the at least a
portion of the eye of the wearer is the lens of the eye.
434. A wearable computing device as claimed in claim 433, wherein the eye
condition is cataracts
435. A wearable computing device as claimed in claim 426, wherein the disease is
a skeletal defect.
436. A wearable computing device as claimed in claim 435, wherein a skeletal
defect is scoliosis.
437. A wearable computing device as claimed in claim 435, wherein at least one
sensor comprises at least one of a gyroscope and an accelerometer and wherein the
processor is further controlled by the computer program code to:
receive, from the at least one sensor, at least one of gyroscope and
accelerometer data; and
calculate, using the at least one of the gyroscope and accelerometer data, the
skeletal defect.
438. A wearable computing device as claimed in claim 435, wherein the processor
is further controlled by the computer program code to calculate a postural remedy.
439. A wearable computing device as claimed in claim 433, further comprising an
augmented reality display device for displaying digital data in augmented reality and
being coupled to the processor, wherein the processor is further controlled by the
computer program code to:
display, using the augmented reality display device, the postural remedy.
440. A wearable computing device as claimed in claim 426, wherein the disease is
diabetes.
441. A wearable computing device as claimed in claim 440, wherein the at least
one sensor comprises a blood glucose level sensor.
442. A wearable computing device as claimed in claim 441, wherein the blood glucose level sensor is an infrared sensor.
443. A wearable computing device as claimed in claim 428, wherein the disease is a neuromuscular disease.
444. A wearable computing device as claimed in claim 443, wherein the neuromuscular disease is Parkinson's disease.
445. A wearable computing device as claimed in claim 443, wherein the processor is further controlled by the computer program code to calculate a gait remedy.
446. A wearable computing device as claimed in claim 445, further comprising an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor; and wherein the processor is further controlled by the computer program code to:
   display, using the augmented reality display device, the gait remedy.
447. A wearable computing device as claimed in claim 446, wherein the gait remedy comprises virtual foot guides.
448. A wearable computing device as claimed in claim 426, wherein the disease is colour blindness.
449. A wearable computing device as claimed in claim 448, further comprising an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor; and wherein the processor is further controlled by the computer program code to:
   display, using the augmented reality display device, a colour blindness corrected Image.
450. A wearable computing device as claimed in claim 449, wherein the colour blindness corrected Image comprises the substitution of at least one colour with another colour.
451. A wearable computing device as claimed in claim 450, wherein the at least one colour is red.
452. A wearable computing device as claimed in claim 450, wherein the another colour is yellow.
453. A wearable computing device as claimed in claim 450, wherein the processor is further controlled by the computer program code to calculate the proximity of the colour red and the colour green.
454. A wearable computing device as claimed in claim 453, further comprising an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor;

display, using the augmented reality display device, the colour blindness corrected image.

455. A wearable computing device as claimed in claim 454, further comprising an augmented reality display device for displaying digital data in augmented reality and being coupled to the processor;

display, using the augmented reality display device, a colour blind test message.

456. A wearable computing device as claimed in claim 455, further comprising a user Input Interface adapted for receiving user Input data, and wherein the processor is further controlled by the computer problem code to receive, via the user input Interface, acknowledgement data representing an acknowledgement of the colour blind test message.

457. A wearable computing device as claimed in claim 426, wherein the disease is a balance disorder.

458. A wearable computing device as claimed in claim 457, wherein the at least one sensor comprises at least one of a gyroscope and accelerometer and wherein the processor is further controlled by the computer problem code to:

receive, from the at least one of the gyroscope and accelerometer at least one of positional and acceleration data; and

calculate an impending imbalance in accordance with the at least one of positional and exploration data.

459. A wearable computing device as claimed in claim 458, wherein the at least one sensor is adapted for location approximate and peripheral the waist of a user.

460. A wearable computing device as claimed in claim 459, wherein the at least one sensor is adapted for location within a belt.

461. A wearable computing device as claimed in claim 458, further comprising at least one airbag and wherein the processor is further controlled by the computer program code to deploy the at least one airbag.

452. A wearable computing device as claimed in claim 426, wherein the disease is a neuromuscular disease.
463. A wearable computing device as claimed in claim 462, wherein the neuromuscular disease is indicated by at least one of tremors and twitching.

464. A wearable computing device as claimed in claim 463, wherein the at least one sensor is adapted for mounting proximity the wrist of a user.

465. A wearable computing device as claimed in claim 426, wherein the disease is Alzheimer's.

466. A wearable computing device as claimed in claim 465, wherein the at least one sensor is adapted to measure the intercranlai pressure of a user.

467. A wearable computing device as claimed in claim 466, wherein the at least one sensor is adapted to measure the Intercranlai pressure of the optic nerve sheath of a user.

468. A wearable computing device as claimed in claim 465, wherein the least one sensor is adapted to measure the stapedial reflex of a user.

470. A wearable computing device as claimed in claim 465, wherein at least one sensor is adapted to employ an ultrasonic technique in measuring the Intercranlai pressure.

471. A wearable computing device as claimed in claim 465, wherein the at least one sensor is adapted for detecting papilledema.

472. A wearable computing device as claimed in claim 465, wherein the at least one sense comprises an electroencephalography sensor.

473. A wearable computing device as claimed in claim 465, wherein the at least one sensor comprises any infrared spectroscopy sensor.

474. A wearable computing device as claimed in claim 426, wherein the disease is loss of hearing.

475. A wearable computing device as claimed in claim 474, further comprising an audio play out device, and wherein the processor is further controlled by the computer program code to:

- play out, using the audio player device a test audio signal.

476. A wearable computing device as claimed in claim 475, wherein the test audio signal is characterised in frequency.
477. A wearable computing device as claimed in claim 475, wherein the test audio signal is characterised in volume.

478. A wearable computing device as claimed in claim 475, further comprising a user input interface adapted for receiving user input data, and wherein the processor is further controlled by the computer problem code to receive, via the user input Interface, acknowledgement data representing an acknowledgement of the test audio signal.

479. A wearable computing device as claimed in claim 428, wherein the disease is Intoxication.

480. A wearable computing device as claimed in claim 479, wherein the at least one sensor is adapted for measuring a blood alcohol content of a user.

481. A wearable computing device as claimed in claim 480, wherein at least one sensor is adapted for tissue spectrometry.

482. A wearable computing device as claimed in claim 480, wherein at least one sensor is adapted for breath spectrometry.

483. A wearable computing device as claimed in claim 480, wherein at least one sensor comprises a transdermal alcohol sensor.

484. A wearable computing device as claimed in claim 426, wherein the disease is tooth decay.

485. A wearable computing device as claimed in claim 484, wherein at least one sensor comprises an image capture device adapted for capturing image data representing at least a portion of the mouth of a user and wherein the processor is further controlled by the computer program code to:
   calculate the disease in accordance with the image data.

486. A wearable computing device as claimed in claim 426, further comprising a data interface for sending and receiving data, the data interface being coupled to the processor, and wherein the processor is further controlled by the computer program code to:
   send, via the data interface, alert data indicative of the disease.

487. A wearable computing device as claimed in claim 420, wherein the processor is further controlled by the computer program code to:
   calculate a remedial medication in accordance with the disease.
488. A wearable computing device as **claimed** in **claim 487**, wherein the processor is further **controlled** by the computer program code to determine a side-effect of the remedial medication.

489. An server for diagnosing a disease, the application server device comprising:

5 a processor for processing digital data;

a memory device for storing digital data including computer program code and being coupled to the processor: and

a data interface for sending and receiving data across a data network, the data interface being coupled to the processor, wherein the processor is controlled by the computer program code to:

receive, via the data interface, sensor input data,

calculate, using the sensor input data, the disease in accordance with the sensor input data.

490. A server as claimed in claim 489, wherein the disease is an eye disease.

15 491. A server as claimed in claim 490, wherein the processor is further controlled by the computer program code to:

receive, via the data interface, image data representing an image capture of at least a portion of an eye of a wearer; and

calculate the eye disease in accordance with the image data.

20 492. A server as claimed in claim 491, wherein the at least a portion of the eye of the wearer is the sclera of the eye.

493. A server as claimed in claim 492, wherein the processor is further controlled by the computer program code to calculate the eye disease in accordance with a colour recognition technique.

25 494. A server as claimed in claim 493, wherein the eye condition is jaundice.

495. A server as claimed in claim 492, wherein the at least a portion of the eye of the wearer is the iris of the eye.

496. A server as claimed in claim 492, wherein the at least a portion of the eye of the wearer is the lens of the eye.

30 497. A server as claimed in claim 496, wherein the eye condition is cataracts.

498. A server as claimed in claim 489, wherein the disease is a skeletal defect.

499. A server as claimed in claim 498, wherein a skeletal defect is scoliosis.
500. A server as claimed in claim 498, wherein the processor is further controlled by the computer program code to:

   receive, from the via the data Interface, at least one of gyroscope and **accelerometer** data; and

   calculate, using the at least one of the gyroscope and accelerometer data, the skeletal defect.

501. A server as claimed in claim 498, wherein the processor is further controlled by the computer program code to calculate a postural remedy.

502. A server as claimed in claim 501, wherein the processor is further controlled by the computer program code to:

   send, via the data Interface, display data for displaying using an augmented reality display device, the display data representing the postural remedy.

503. A server as claimed in claim 489, wherein the disease is diabetes.

504. A server as claimed in claim 503, wherein the sensor input data represents a blood glucose level.

505. A server as claimed in claim 504, wherein the blood glucose level is an In-ear blood glucose level.

506. A server as claimed in claim 489, wherein the disease is a neuromuscular disease.

507. A server as claimed in claim 508, wherein the neuromuscular disease is Parkinsons disease.

508. A server as claimed in claim 506, wherein the processor is further controlled by the computer program code to calculate a gait remedy.

509. A server as claimed in claim 508, wherein the processor is further controlled by the computer program code to:

   send, via the data Interface, display data for display using an augmented reality display device, the display data representing the gait remedy.

510. A server as claimed in claim 509, wherein the gait remedy comprises virtual foot guides.

511. A server as claimed in claim 489, wherein the disease is colour blindness.

512. A server as claimed in claim 511, wherein the processor is further controlled by the computer program code to:
send, via the data interface, display data for display using an augmented reality display device, the display data representing a colour blindness corrected image.

513. A server as claimed in claim 512, wherein the colour blindness corrected image comprises the substitution of at least one colour with another colour.

514. A server as claimed in claim 513, wherein the at least one colour is red.

515. A server as claimed in claim 513, wherein the another colour is yellow.

516. A server as claimed in claim 513, wherein the processor is further controlled by the computer program code to calculate the proximity of the colour red and the colour green.

517. A server as claimed in claim 516, wherein the processor is further controlled by the computer program code to:

send, via the data interface, display data for display using an augmented reality display device, the display data representing the colour blindness corrected image.

518. A server as claimed in claim 517, wherein the processor is further controlled by the computer program code to:

send, via the data Interface, display data for display using an augmented reality display device, the display data representing a colour blind test message.

519. A server as claimed in claim 518, wherein the processor is further controlled by the computer problem code to receive, via the data interface, acknowledgement data representing an acknowledgement of the colour blind test message.

520. A server as claimed in claim 489, wherein the disease is a balance disorder.

521. A server as claimed in claim 520, wherein the processor is further controlled by the computer problem code to:

receive, via the data Interface, at least one of positional and acceleration data; and

calculate an impending Imbalance in accordance with the at least one of positional and acceleration data.

522. A server as claimed in claim 521, wherein the positional and acceleration data represents at least one of a position and acceleration proximate a waist of a user.

523. A server as claimed in claim 522, wherein proximate a waist of a user is proximate a belt of the user.
A server as claimed in claim 521, wherein the processor is further controlled by the computer program code to, send, via the data interface, deployments data representing an instruction to deploy at least one alrbag.

A server as claimed in claim 525, wherein the neuromuscular disease is indicated by at least one of tremors and twitching.

A server as claimed in claim 526, wherein the sensor input data comprises sensor Input data obtained from proximate the wrist of a user.

A server as claimed in claim 489, wherein the disease is Alzheimer's.

A server as claimed in claim 528, wherein the sensor input data represents Intercranial pressure of a user.

A server as claimed in claim 529, wherein the sensor input data represents optic nerve sheath Intercranial pressure.

A server as claimed in claim 529, wherein the sensor input data is obtained utilising an ultrasonic technique.

A server as claimed in claim 528, wherein the sensor input data is a measurement of the stapedial reflex of a user.

A server as claimed in claim 528, wherein at least sensor Input data represents a fundoscopy measurement.

A server as claimed in claim 528, wherein the sensor input data is papilledema sensor Input data.

A server as claimed in claim 528, wherein the sensor Input data is electroencephalography sensor Input data.

A server as claimed in claim 528, wherein the sensor input data is Infrared spectroscopy sensor Input data.

A server as claimed in claim 489, wherein the disease is loss of hearing.

A server as claimed in claim 537, wherein the processor is further controlled by the computer program code to:

send, via the data interface, audio data for play out using an audio play out device, the audio data representing test audio signal.

A server as claimed in claim 538, wherein the test audio signal is characterised in frequency.
540. A server as **claimed** in claim 538, wherein the test audio signal is characterised in volume.

541. A server as claimed in claim 538, wherein the processor is further controlled by the computer program code to receive, via the data interface, acknowledgement data representing an acknowledgement of the test audio signal.

542. A server as claimed in claim 489, wherein the disease is intoxication.

543. A server as claimed in claim 542, wherein the sensor input data is blood alcohol content sensor input data.

544. A server as claimed in claim 543, wherein the sensor input data is tissue spectrometry sensor input data.

545. A server as claimed in claim 543, wherein the sensor input data is breath spectrometry sensor input data.

546. A server as claimed in claim 543, wherein the sensor input data is transdermal alcohol sensor input data.

547. A server as claimed in claim 489, wherein the disease is tooth decay.

548. A server as claimed in claim 547, wherein the processor is further controlled by the computer program code to:

   calculate the disease in accordance with image data.

549. A server as claimed in claim 489, wherein the processor is further controlled by the computer program code to:

   send, via the data interface, alert data indicative of the disease.

550. A server as claimed in claim 489, wherein the processor is further controlled by the computer program code to:

   calculate a remedial medication in accordance with the disease.

551. A server as claimed in claim 550, wherein the processor is further controlled by the computer program code to determine a side-effect of the remedial medication.

552. A computer readable storage medium for diagnosing a disease, the computer readable storage medium comprising computer code instructions for:

   receiving sensor input data,

   calculating, using the sensor input data, the disease in accordance with the sensor input data.

553. A computer readable storage medium as claimed in claim 552, wherein the disease is an eye disease.
554. A computer readable storage medium as claimed in claim 553, further comprising instructions for:

receiving image data representing an image capture of at least a portion of an eye of a wearer; and

calculating the eye disease in accordance with the image data.

555. A computer readable storage medium as claimed in claim 554, wherein the at least a portion of the eye of the wearer is the sclera of the eye.

556. A computer readable storage medium as claimed in claim 555, further comprising instructions for calculating the eye disease in accordance with a colour recognition technique.

557. A computer readable storage medium as claimed in claim 556, wherein the eye condition is jaundice.

558. A computer readable storage medium as claimed in claim 555, wherein the at least a portion of the eye of the wearer is the iris of the eye.

559. A computer readable storage medium as claimed in claim 555, wherein the at least a portion of the eye of the wearer is the lens of the eye.

560. A computer readable storage medium as claimed in claim 559, wherein the eye condition is cataracts

561. A computer readable storage medium as claimed in claim 552, wherein the disease is a skeletal defect.

562. A computer readable storage medium as claimed in claim 561, wherein a skeletal defect is scoliosis.

563. A computer readable storage medium as claimed in claim 561, further comprising instructions for:

receiving at least one of gyroscope and accelerometer data; and

calculating, using the at least one of the gyroscope and accelerometer data, the skeletal defect.

564. A computer readable storage medium as claimed in claim 561, further comprising instructions for calculating a postural remedy.

565. A computer readable storage medium as claimed in claim 564, further comprising instructions for:
sending display data for displaying using an augmented reality display device, the display data representing the postural remedy.

566. A computer readable storage medium as claimed in claim 552, wherein the disease is diabetes.

567. A computer readable storage medium as claimed in claim 566, wherein the sensor input data represents a blood glucose level.

568. A computer readable storage medium as claimed in claim 567, wherein the blood glucose level is an impar blood glucose level.

569. A computer readable storage medium as claimed in claim 552, wherein the disease is a neuromuscular disease.

570. A computer readable storage medium as claimed in claim 569, wherein the neuromuscular disease is Parkinsons disease.

571. A computer readable storage medium as claimed in claim 569, further comprising Instructions for calculating a gait remedy.

572. A computer readable storage medium as claimed in claim 571, further comprising Instructions for:

- sending display data for display using an augmented reality display device, the display data representing the gait remedy.

573. A computer readable storage medium as claimed in claim 572, wherein the gait remedy comprises virtual foot guides.

574. A computer readable storage medium as claimed in claim 552, wherein the disease is colour blindness.

575. A computer readable storage medium as claimed in claim 574, further comprising Instructions for:

- sending display data for display using an augmented reality display device, the display data representing a colour blindness corrected Image.

576. A computer readable storage medium as claimed in claim 575, wherein the colour blindness corrected image comprises the substitution of at least one colour with another colour.

577. A computer readable storage medium as claimed in claim 576, wherein the at least one colour is red.

578. A computer readable storage medium as claimed in claim 578, wherein the another colour is yellow.
579. A computer readable storage medium as claimed in claim 576, further comprising Instructions for calculating the proximity of the colour red and the colour green.

580. A computer readable storage medium as claimed in claim 579, further comprising Instructions for:

- sending display data for display using an augmented reality display device, the display data representing the colour blindness corrected Image.

581. A computer readable storage medium as claimed in claim 580, further comprising Instructions for:

- sending display data for display using an augmented reality display device, the display data representing a colour blind test message.

582. A computer readable storage medium as claimed in claim 581, wherein the processor is further controlled by the computer problem code to receiving acknowledgement data representing an acknowledgement of the colour blind test message.

583. A computer readable storage medium as claimed in claim 552, wherein the disease is a balance disorder.

584. A computer readable storage medium as claimed in claim 583, wherein the processor is further controlled by the computer problem code to:

- receiving at least one of positional and acceleration data; and
- calculating an impending Imbalance in accordance with the at least one of positional and acceleration data.

585. A computer readable storage medium as claimed in claim 584, wherein the positional and acceleration data represents at least one of a position and acceleration proximate a waist of a user.

586. A computer readable storage medium as claimed in claim 585, wherein proximate a waist of a user is proximate a belt of the user.

587. A computer readable storage medium as claimed in claim 584, further comprising Instructions for, sending deployments data representing an instruction to deploy at least one airbag.

588. A computer readable storage medium as claimed in claim 552, wherein the disease is a neuromuscular disease.
A computer readable storage medium as claimed in claim 588, wherein the neuromuscular disease is indicated by at least one of tremors and twitching.

A computer readable storage medium as claimed in claim 589, wherein the sensor input data comprises sensor input data obtained from proximate the wrist of a user.

A computer readable storage medium as claimed in claim 552, wherein the disease is Alzheimer's.

A computer readable storage medium as claimed in claim 591, wherein the sensor input data represents Interoraniai pressure of a user.

A computer readable storage medium as claimed in claim 592, wherein the sensor input data represents optic nerve sheath intercranial pressure.

A computer readable storage medium as claimed in claim 592, wherein the sensor input data is obtained utilising an ultrasonic technique.

A computer readable storage medium as claimed in claim 591, wherein the sensor input data is a measurement of the stapedial reflex of a user.

A computer readable storage medium as claimed in claim 591, wherein at least sensor input data represents a fundoscopy measurement.

A computer readable storage medium as claimed in claim 591, wherein the sensor input data is papilledema sensor input data.

A computer readable storage medium as claimed in claim 591, wherein the sensor input data is electroencephalography sensor input data.

A computer readable storage medium as claimed in claim 591, wherein the sensor input data is Infrared spectroscopy sensor input data.

A computer readable storage medium as claimed in claim 552, wherein the disease is loss of hearing.

A computer readable storage medium as claimed in claim 600, further comprising Instructions for:

sending audio data for play out using an audio play out device, the audio data representing test audio signal.

A computer readable storage medium as claimed in claim 601, wherein the test audio signal is characterised in frequency.

A computer readable storage medium as claimed in claim 601, wherein the test audio signal is characterised in volume.
604. A computer **readable** storage medium as claimed in claim 801, wherein the processor is further controlled by the computer problem code to receiving acknowledgement data representing an acknowledgement of the test audio signal.

605. A computer readable storage medium as claimed in claim 552, wherein the disease is Intoxication.

606. A computer readable storage medium as claimed in claim 605, wherein the sensor Input data is blood alcohol content sensor Input data.

607. A computer readable storage medium as claimed in claim 606, wherein the sensor Input data is tissue spectrometry sensor input data.

608. A computer readable storage medium as claimed in claim 608, wherein the sensor Input data is breath spectrometry sensor input data.

609. A computer readable storage medium as claimed in claim 606, wherein the sensor Input data is transdermal alcohol sensor Input data.

610. A computer readable storage medium as claimed in claim 552, wherein the disease is tooth decay.

611. A computer readable storage medium as claimed in claim 610, further comprising Instructions for:

- calculating the disease in accordance with image data.

612. A computer readable storage medium as claimed in claim 552, further comprising Instructions for:

- sending alert data indicative of the disease.

613. A computer readable storage medium as claimed in claim 552, further comprising Instructions for:

- calculating a remedial medication in accordance with the disease.

614. A computer readable storage medium as claimed in claim 613, further comprising Instructions for determine a side-effect of the remedial medication.

615. A mobile computing device as claimed in claim 1A, wherein the environment Input data comprises Image data.

616. A mobile computing device as claimed in claim 615, wherein, in calculating the occurrence of the anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with an image recognition technique.
617. A mobile computing device as claimed in claim 616, wherein the image recognition technique is adapted for recognising an object.

618. A mobile computing device as claimed in claim 616, wherein the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first data and the second data.

619. A mobile computing device as claimed in claim 615, wherein the image data comprises video data.

620. A mobile computing device as claimed in claim 614, wherein the environmental input data comprises audio data.

621. A mobile computing device as claimed in claim 820, wherein, in calculating the occurrence of anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with an audio recognition technique.

622. A mobile computing device as claimed in claim 621, wherein the audio recognition technique is adapted for recognising a sound.

623. A mobile computing device as claimed in claim 614, wherein the environmental input data comprises acceleration data.

624. A mobile computing device as claimed in claim 823, wherein, in calculating the occurrence of anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with a movement recognition technique.

625. A mobile computing device as claimed in claim 624, wherein the movement recognition technique comprises recognising a movement.

626. A mobile computing device as claimed in claim 613, further comprising an Interface for outputting Information, and wherein the processor is further controlled by the computer program code to output Indication data representing an Indication of the occurrence of the anxiety disorder.

627. A mobile computing device as claimed in claim 626, wherein the Interface comprises a haptic interface.

628. A mobile computing device as claimed in claim 627, wherein the haptic Interface is adapted to vibrate.
629. A mobile computing device as claimed in claim 826, wherein the interface comprises a data interface for sending data across a data network, and wherein the processor is further controlled by the computer program code to send the indication data via the data interface.

630. A mobile computing device as claimed in claim 626, wherein interface comprises a display device, and wherein the processor is further controlled by the computer program code to display the indication data using the display device.

631. A mobile computing device as claimed in claim 630, wherein the display device comprises an augmented reality display device.

632. A mobile computing device as claimed in claim 614, wherein the mobile computing device comprises a wearable portion.

635. A mobile computing device as claimed in claim 634, wherein the mobile computing device comprises a headset.

636. A mobile computing device as claimed in claim 635, wherein the sensor is located at the headset.

637. An application server for detecting a user anxiety disorder, the application server comprising:

- a processor for processing digital data;
- a memory device for storing digital data including computer program code and being coupled to the processor;
- a network interface for sending and receiving data across a data network and being coupled to the processor, wherein the processor is controlled by the computer program code to:

  receive, via the network interface, the environment input data,
  calculate the occurrence of the anxiety disorder in accordance with the environment input data.
638. An application server as claimed in claim 637, wherein the environment input data comprises image data.

639. An application server as claimed in claim 638, wherein, in calculating the occurrence of the anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with an image recognition technique.

640. An application server as claimed in claim 639, wherein the image recognition technique is adapted for recognising an object.

641. An application server as claimed in claim 639, wherein the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first image data and the second image data.

642. An application server as claimed in claim 638, wherein the image data comprises video data.

643. An application server as claimed in claim 637, wherein the environmental input data comprises audio data.

644. An application server as claimed in claim 643, wherein, in calculating the occurrence of anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with an audio recognition technique.

645. An application server as claimed in claim 644, wherein the audio recognition technique is adapted for recognising a sound.

646. An application server as claimed in claim 637, wherein the environmental input data comprises acceleration data.

647. An application server as claimed in claim 644, wherein, in calculating the occurrence of anxiety disorder, the processor is further controlled by the computer program code to calculate the occurrence of the anxiety disorder in accordance with a movement recognition technique.

648. An application server as claimed in claim 647, wherein the movement recognition technique comprises recognising a movement.

649. An application server as claimed in claim 637, wherein the processor is further controlled by the computer program code to send, via the network interface, indication data representing an indication of the occurrence of the anxiety disorder.
650. An **application server** as claimed in claim 649, wherein the indication data is adapted for display by a display device.

651. An **application server** as claimed in claim 850, wherein the display device comprises an augmented reality display device.

652. An **application server** as claimed in claim 849, wherein the indication data further comprises Instructions for addressing the anxiety disorder.

653. An **application server** as claimed in claim 649, wherein the Indication data is adapted for use by a haptic Interface.

654. An **application server** as claimed in claim 853, wherein the haptic Interface is adapted to vibrate.

655. A computer readable storage medium for detecting a user anxiety disorder, the computer readable storage medium having computer program code Instructions recorded thereon, the computer program code instructions being executable by a computer and comprising:

- instructions for receiving, via a network interface, the environment input data,
- instructions for calculating the occurrence of the anxiety disorder in accordance with the environment input data.

656. A computer readable storage medium as claimed in claim 655, wherein the environment input data comprises image data.

657. A computer readable storage medium as claimed in claim 656, wherein, further comprising instructions for calculating the occurrence of the anxiety disorder in accordance with an image recognition technique.

658. A computer readable storage medium as claimed in claim 657, wherein the image recognition technique is adapted for recognising an object.

659. A computer readable storage medium as claimed in claim 657, wherein the image recognition technique is adapted for receiving first image data at a first time and second Image data at a second later time, and comparing the first image data and the second image data.

660. A computer readable storage medium as claimed in claim 656, wherein the image data comprises video data.

661. A computer readable storage medium as claimed in claim 655, wherein the environmental input data comprises audio data.
662. A computer readable storage medium as claimed in claim 661, further comprising instructions for calculating the occurrence of the anxiety disorder in accordance with an audio recognition technique.

663. A computer readable storage medium as claimed in claim 662, wherein the audio recognition technique is adapted for recognising a sound.

664. A computer readable storage medium as claimed in claim 655, wherein the environmental input data comprises acceleration data.

665. A computer readable storage medium as claimed in claim 664, further comprising instructions for calculating the occurrence of the anxiety disorder in accordance with a movement recognition technique.

666. A computer readable storage medium as claimed in claim 665, wherein the movement recognition technique comprises recognising a movement.

667. A computer readable storage medium as claimed in claim 655, further comprising instructions for sending, via the network interface, indication data representing an indication of the occurrence of the anxiety disorder.

668. A computer readable storage medium as claimed in claim 667, wherein the indication data is adapted for display by a display device.

669. A computer readable storage medium as claimed in claim 668, wherein the display device comprises an augmented reality display device.

670. A computer readable storage medium as claimed in claim 667, wherein the indication data further comprises instructions for addressing the anxiety disorder.

671. A computer readable storage medium as claimed in claim 667, wherein the indication data is adapted for use by a haptic interface.

672. A computer readable storage medium as claimed in claim 671, wherein the haptic interface is adapted to vibrate.

673. A system for detecting a user anxiety disorder, the system comprising:

- a wearable device; and
- an application server;

wherein the application server is adapted to receive from the wearable device environment input data, and

the application server is adapted to calculate the occurrence of the anxiety disorder in accordance with the environment input data.
674. A system as claimed in claim 673, wherein the environment Input data comprises Image data.

675. A system as claimed in claim 674, wherein, in calculating the occurrence of the anxiety disorder, the application server is adapted to calculate the occurrence of the anxiety disorder in accordance with an image recognition technique.

676. A system as claimed in claim 675, wherein the image recognition technique is adapted for recognising an object.

677. A system as claimed in claim 675, wherein the image recognition technique is adapted for receiving first image data at a first time and second image data at a second later time, and comparing the first image data and the second image data.

678. A system as claimed in claim 674, wherein the image data comprises video data.

679. A system as claimed in claim 673, wherein the environmental Input data comprises audio data.

686. A system as claimed in claim 679, wherein, in calculating the occurrence of an anxiety disorder, the application server is adapted to calculate the occurrence of the anxiety disorder in accordance with an audio recognition technique.

681. A system as claimed in claim 680, wherein the audio recognition technique is adapted for recognising a sound.

682. A system as claimed in claim 680, wherein the audio recognition technique is adapted for receiving first audio data at a first time and second audio data at a second later time, and comparing the first audio data and the second audio data.

683. A system as claimed in claim 682, wherein the environmental Input data comprises acceleration data.

634. A system as claimed in claim 633, wherein, in calculating the occurrence of anxiety disorder, the application server is adapted to calculate the occurrence of the anxiety disorder in accordance with a movement recognition technique.

685. A system as claimed in claim 684, wherein the movement recognition technique comprises recognising a movement.

686. A system as claimed in claim 684, wherein the movement recognition technique is adapted for receiving first movement data at a first time and second movement data at a second later time, and comparing the first movement data and the second movement data.
687. A system as claimed in claim 873, wherein the application server further comprises a data interface for outputting information, and upon the occurrence of the anxiety disorder, the application server is adapted to output, via the data interface, Indication data representing an Indication of the occurrence of the anxiety disorder to the wearable device; and

wherein the wearable device comprises a device output interface for outputting information to the user.

688. A system as claimed in claim 687, wherein the device output interface comprises a haptic interface.

689. A system as claimed in claim 688, wherein the haptic interface is adapted to vibrate.

690. A system as claimed in claim 687, wherein the device output interface is a display device, and wherein the wearable device is adapted to display the Indication data using the display device.

691. A system as claimed in claim 690, wherein the display device comprises an augmented reality display device.

692. A system as claimed in claim 691, wherein the wearable device is adapted to display the Indication of the occurrence of the anxiety disorder in augmented reality.

693. A system as claimed in claim 690, wherein the wearable device is adapted to display Instructions for addressing the anxiety disorder.

694. A system as claimed in claim 673, wherein the wearable device comprises a headset.

695. A system as claimed in claim 674, wherein the sensor is located at the headset.

696. A system as claimed in claim 687, wherein the device output interface is an audio interface, and wherein the wearable device is adapted to play out the Indication data using the audio interface.
Figure 2
Warning:
You are displaying obsessive compulsive characteristics. Take your medicine.
Figure 5
Figure 7
Apply 10 counts of compression

Figure 8
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

G06Q 50/22 (2012.01)  G06F 19/00 (2011.01)

According to International Patent Classification (IPC) or to both national classification and IPC.

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Databases: EPDOC, WPI: IPC G06F, G06Q Keywords (augmented, reality, wear, worn sensor, biosensor, measure monitor, diagnose, health, vitality, disease, sickness, condition, and similar terms)

Full text searches on Google/Google Patents/ Google Scholar websites, similar keywords as above also: (augmented, reality, glasses, health, wearable, sensor, diagnose, disease)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<td>X</td>
<td>Further documents are listed in the continuation of Box C</td>
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<td>X</td>
<td>See patent family annex</td>
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* Special categories of cited documents:
  "A" document defining the general state of the art which is not considered to be of particular relevance
  "E" earlier application or patent but published on or after the international filing date
  "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  "O" document referring to an oral disclosure, use, exhibition or other means
  "P" document published prior to the international filing date but later than the priority date claimed
  "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
  "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
  "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
  "&" document member of the same patent family

Date of the actual completion of the international search
31 October 2013

Date of mailing of the international search report
31 October 2013

Name and mailing address of the ISA/All

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**INTERNATIONAL SEARCH REPORT**

**Box No. II  Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☑ Claims Nos.:
   - because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
   - because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☑ Claims Nos.:
   - because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

**Box No. III  Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

**See Supplemental Box for Details**

1. ☑ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☑ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☑ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
   - 1-255, 278-329, 352-403 and 615-619

**Remark on Protest**

- ☑ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

- ☑ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

- ☑ No protest accompanied the payment of additional search fees.
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<td>US 2011/0227813 A1 (HADDICK et al.) 22 September 2011 abstract, paras [0021]-[0024], [0066], [0069], [0151],[0152],[0155]-[0157],[0208],[0216],[0218],[0219],[0228],[0238]-[0247],[0252],[0258],[0267],[0269],[0277],[0278],[0298],[0309],[0323]-[0333],[0337],[370], Fig 6, 14A Paras [0238]-[0247]</td>
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<td>US 2012/0179665 A1 (BAARMAN et al.) 12 July 2012 paras [0034]-[0085], Figs 1-4 and 7-15</td>
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Continuation of: Box III

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1-255, 278-329, 352-403 and 615-619 are directed to a mobile computing device, application server, system or computer readable medium which capture data from one or more sensory inputs for the calculation of a vitality index. The feature of The feature of calculating a vitality index is specific to this group of claims, is specific to this group of claims.

- Claims 256-266, 330-340 and 404-414 are directed to an application server or computer readable medium for the collection of sensory data to identify an environmental hazard. The feature of The feature of identifying an environmental hazard is specific to this group of claims, is specific to this group of claims.

- Claims 267-277, 341-351 and 415-425 are directed to mobile computing device, application server or computer readable medium for the production of an augmented image based on sensor input data. The feature of The feature of generating an augmented image is specific to this group of claims, is specific to this group of claims.

- Claims 426-488, 489-551, 552-614 and 620-636 are directed to a wearable computing device, server or computer readable storage medium for the diagnosis of a disease based on sensor input data. The feature of The feature of diagnosing a disease is specific to this group of claims, is specific to this group of claims.

- Claims 637-687 are directed to a server, a system and computer readable medium for the detection of an anxiety disorder. The feature of The feature of the detection of an anxiety disorder is specific to this group of claims, is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. Therefore there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied a priori.
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.
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Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

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