



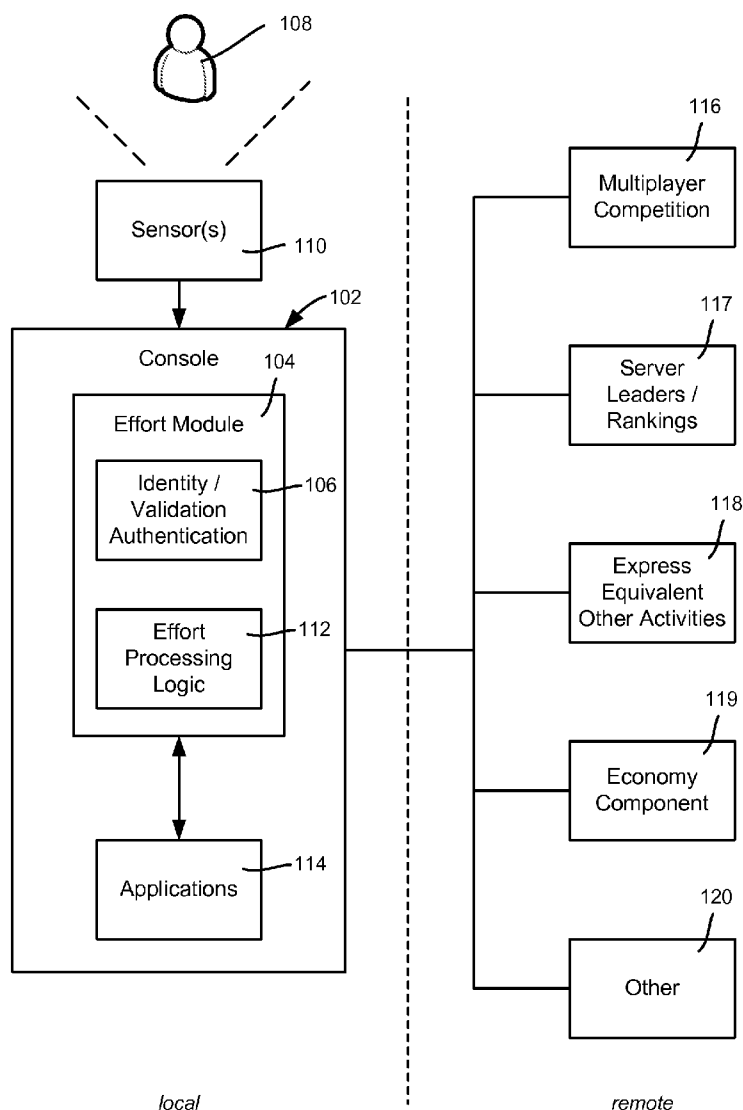
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Kennett et al.(10) **Pub. No.: US 2014/0244008 A1**(43) **Pub. Date: Aug. 28, 2014**(54) **USING A TRUE REPRESENTATION OF
EFFORT FOR FITNESS****Publication Classification**(71) Applicant: **MICROSOFT CORPORATION**,
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(57)

ABSTRACT

The subject disclosure is directed towards determining and using effort such as in a fitness/exercise/gaming environment in a way that is substantially independent of a person's height, weight, age, and gender (HWAG) properties. Effort data is recorded that represents a person's effort exerted with respect to performing at least one physical activity, in which effort data is substantially independent of weight, and possibly other HWAG properties. In one aspect, effort duration is used to allow different people to compete against others and/or against established targets/goals substantially equally, independent of a person's HWAG properties.



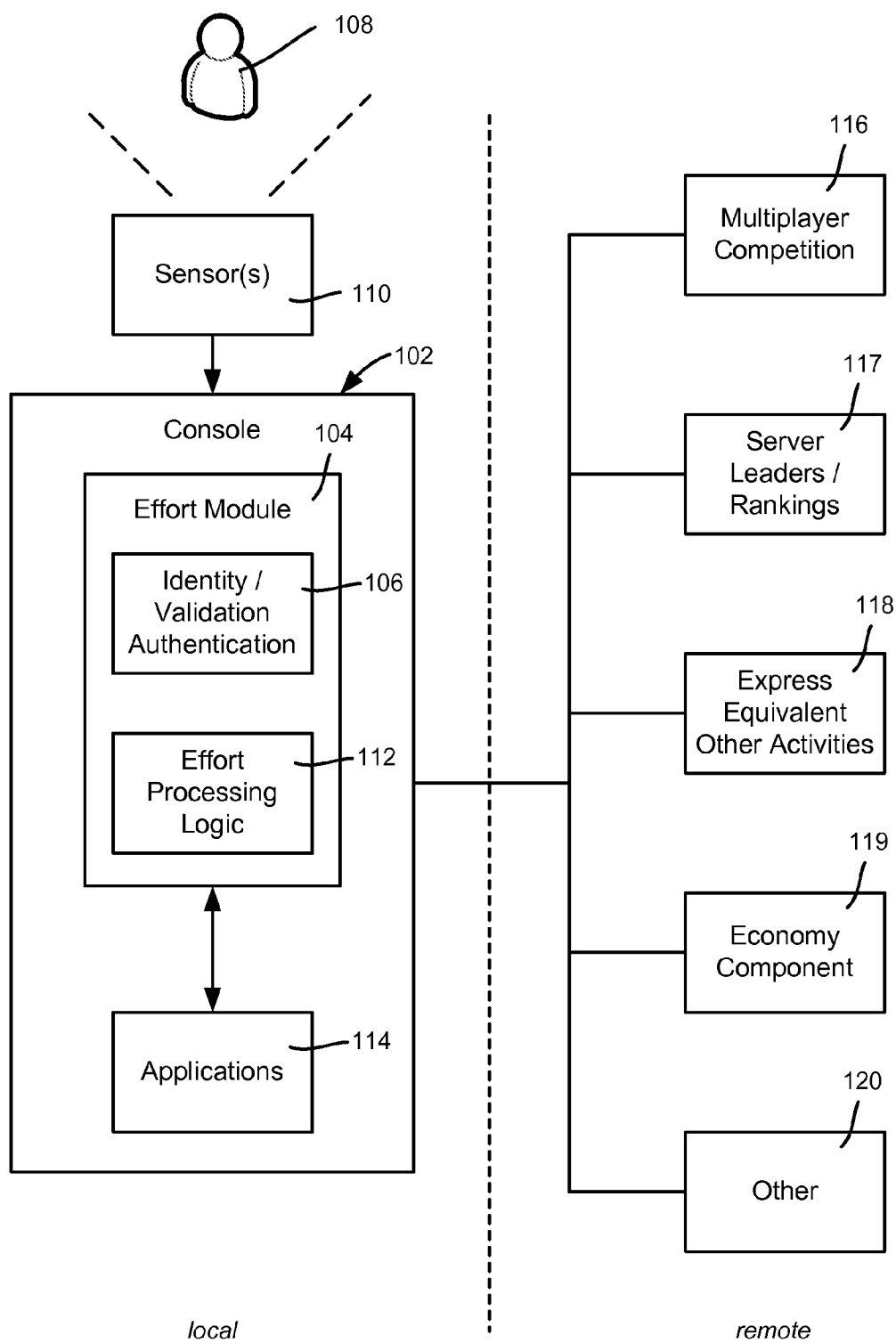


FIG. 1

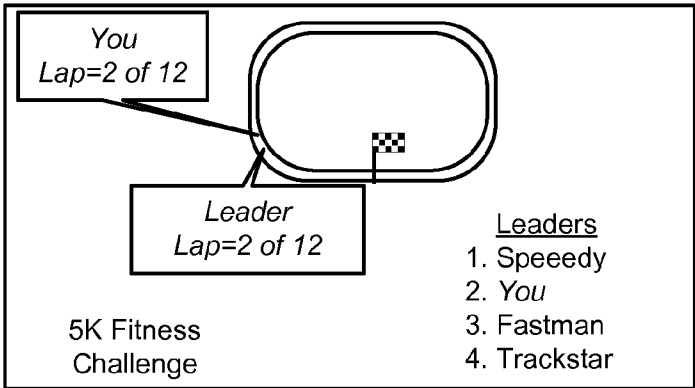


FIG. 2A

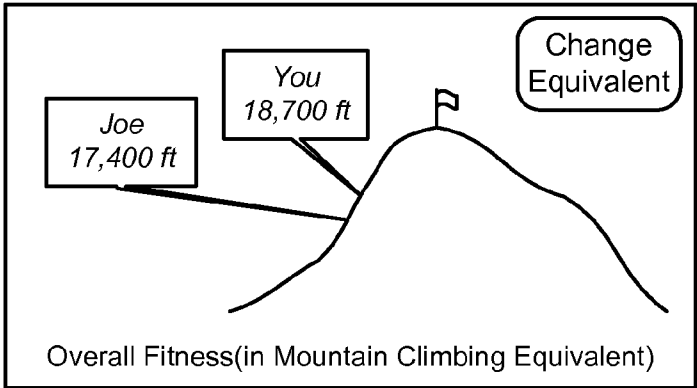
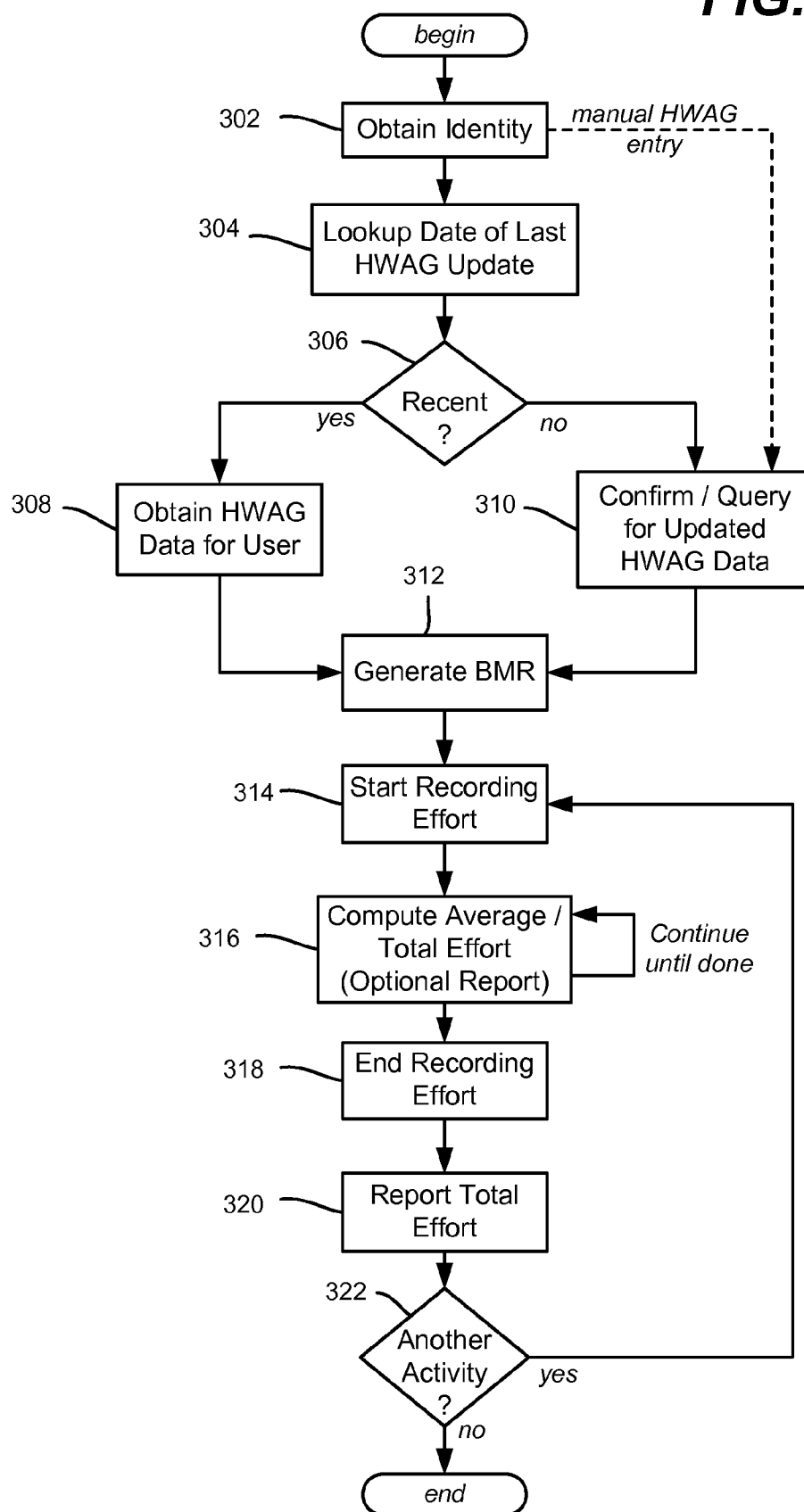


FIG. 2B

Equivalents (in minutes) to your 30 minutes of Running	Running	30
	Golfing	60
	Gymnastics	56
	Hiking	38
	Hockey	28
	Racquetball	26
	Rollerblading ..	38
	Skiing	32
	Volleyball	41
	Walking	59

FIG. 2C

FIG. 3



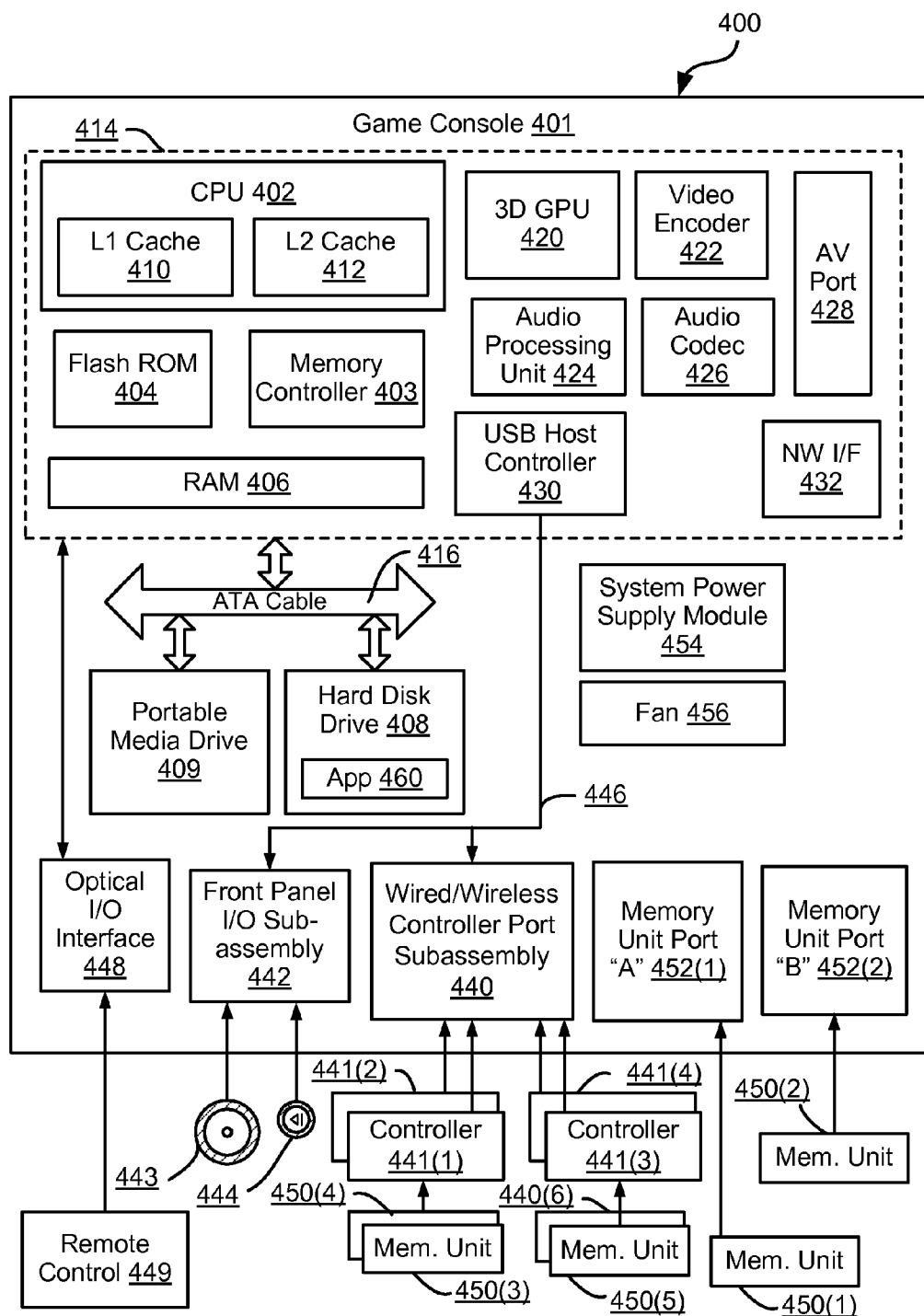


FIG. 4

USING A TRUE REPRESENTATION OF EFFORT FOR FITNESS

BACKGROUND

[0001] Gaming consoles and other computer/mobile device applications are being used to provide fitness and exercise challenges. Users can compete with one another and/or against preset goals.

[0002] A standard way to measure the result of fitness and exercise is by calories burned. This correlates well with calories consumed; many food products provide calorie information to allow people to quickly assess their intake, which they can balance against the calories burned via physical activities.

[0003] However, calories are not particularly good measure in competitive fitness and exercise challenges, in that the amount of calories burned is a biased gauge of effort. In general, the more a person weighs, the more calories that person will burn during a physical activity. Thus, if a heavy person and a light person are doing the same activity for the same duration in a competition, using calories as the measure favors the heavier person, as he or she will burn more calories. In addition to weight, (which is the most influential factor in calories burned), height, age, and gender are other factors that contribute to calories burned.

SUMMARY

[0004] This Summary is provided to introduce a selection of representative concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used in any way that would limit the scope of the claimed subject matter.

[0005] Briefly, various aspects of the subject matter described herein are directed towards a technology in which effort is gauged to allow for more meaningful comparisons in exercise and/or fitness evaluations such as used in competitions. In one aspect, there is described sensing a physical activity, recording effort data representing effort used in performing the physical activity, including computing the effort data based at least in part on intensity and time duration of performing the physical activity, and using the effort data in a comparison.

[0006] In one aspect, a competition component is coupled to a plurality of computing devices via one or more network connections. The competition component is configured to receive data from each computing device corresponding to a participating user in a competition, including effort data that represents an amount of physical activity exerted by the participating user over a time duration, in which the amount is based at least in part upon intensity of the physical activity. The competition component processes the effort data to determine which participating user has exerted the most effort with respect to the competition.

[0007] In one aspect, there is described obtaining identity data of a user. Effort duration data corresponding to effort exerted for a time duration with respect to at least one physical activity performed by the user is recorded, in which the effort exerted for each activity includes a factor representative of an intensity of that activity. The effort data and the identity data are output to a remote entity for use in a comparison against other effort duration data.

[0008] Other advantages may become apparent from the following detailed description when taken in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The present invention is illustrated by way of example and not limited in the accompanying figures in which like reference numerals indicate similar elements and in which:

[0010] FIG. 1 is a block diagram showing various example components that may be used to provide and use a representation of effort for fitness, according to one example embodiment.

[0011] FIGS. 2A and 2B are example representations of how effort may be used in a competition/comparison, according to example embodiments.

[0012] FIG. 2C is an example representation of how effort may be compared against effort of other activities, according to an example embodiment.

[0013] FIG. 3 is a flow diagram showing example steps in using effort measured with respect to fitness, according to one example embodiment.

[0014] FIG. 4 is a block diagram representing an example computing environment into which aspects of the subject matter described herein may be incorporated.

DETAILED DESCRIPTION

[0015] Various aspects of the technology described herein are generally directed towards gauging effort with respect to a physical activity (e.g., in a fitness/exercise and/or gaming environment), in a way that is substantially independent of height, weight, age, and gender (HWAG). To this end, a concept of work is used that reflects the true effort relative to a user (e.g., a game player), such that no one has a significant advantage because of that person's HWAG properties. The effort data is based at least in part on the intensity of each activity along with the time duration of performing that activity. Thus, as used herein, "effort data" and/or "effort duration data" represent a person's effort exerted with respect to performing at least one physical activity, in which effort data is substantially independent of weight, and possibly other HWAG properties.

[0016] In one aspect, effort duration is described as a measure of effort/work. The effort duration measure may be used to allow different people to compete against others and/or against established targets/goals substantially equally, independent of a person's HWAG properties. As will be understood, this allows for a number of physical activity scenarios that are heretofore not available (or if available generally unfair) with calorie-based measures, including gaming competitions, medical/therapeutic applications, equating the effort expended in different physical activities with one another, and so forth.

[0017] It should be understood that any of the examples herein are non-limiting. For instance, a gaming console for competition is described as one technology that uses effort as a measure of physical activity, however other devices and applications, such as mobile devices, personal computers, and possibly dedicated devices such as medical monitors may benefit from the technology described herein. As such, the present invention is not limited to any particular embodiments, aspects, concepts, structures, functionalities or examples described herein. Rather, any of the embodiments,

aspects, concepts, structures, functionalities or examples described herein are non-limiting, and the present invention may be used various ways that provide benefits and advantages in computing and gaming technology, and fitness and physiology in general.

[0018] FIG. 1 shows a block diagram in which a computing device, exemplified in FIG. 1 as a gaming console 102, includes an effort module 104. In the example of FIG. 1, the effort module 104 includes an identity/validation authentication component 106, although as can be readily appreciated, the console 102 may have another (e.g., operating system-provided) identity component that is leveraged by the effort module 104 to determine identity of a user 108. One or more sensors 110, such as based upon Kinect™ technology, may sense user actions, including physical activity, and also may be used in identifying the user, e.g., via facial recognition.

[0019] With respect to sensing effort, a Kinect™-based sensor can track skeletal movements that correspond to physical activity, and can be mapped to a MET value (where MET is metabolic equivalent, comprising published values for various activities), for example. Other sensors may be built into or coupled to the exercise equipment itself, e.g., a treadmill can provide its incline and speed as data (or have such data sensed), a stationary bicycle can provide its pedaling speed and resistance as data, and so forth.

[0020] The effort module 104 includes effort processing logic 112, which as described herein, allows various programs (e.g., applications 114) to collect a consistent measure of the user's effort with respect to performing an activity (or set of activities). It is feasible for each application to implement its own effort processing logic, however having an effort module 104 that is shared by applications provides for consistency, which is useful in competitions and challenges. For example, a "rowing" fitness application may use the effort module 104 to compute how much effort a user has exerted in the same way that a "calisthenics" application does. Thus, overall effort may be consistently combined for a user over different activities, and/or effort may be compared across different activities. Further, the application may be a game in which the recorded representation of the effort corresponds to success in the game, e.g., the more effort the user expends, the more virtual places a user gets to visit in the game. As another example, effort of the player (e.g., average, or for a recent session) also may be used in a game (title) to determine a game character's power level or statistics. For example, in a boxing game, the power level of a player's boxer may be based off the weekly effort total of the player.

[0021] Also represented in FIG. 1 is a set of remote (server-side) modules 116-120 that may use the effort information collected by the effort module 104 and/or applications 114 to provide for group competitions and challenges. Although FIG. 1 shows a single console 102 coupled to the server-side modules 116-120, it is understood that a relatively large number of such consoles and a large community of players may be participating in effort-based scenarios, including those described herein.

[0022] For example, the server-side may include a multi-player competition component 116 that allows users to compete with one another, including as direct competitors or with a "crowd" of other users. Competitions may be arranged and/or managed for fairness or the like, e.g., users may be matched with one another based upon age, interests, available time and so forth, so that, for example, a full-time mom can

compete with other full-time moms instead of users who have far more time to dedicate to a competition.

[0023] A server leaders/ranking component 117 may be provided, whereby users can see a leaderboard of where they stand relative to other users with respect to their effort. Individual activities and overall total activity may be ranked, and leaderboards may be real time totaled overall, and/or over some time periods such as daily, weekly, monthly and so on. As described below, via periodic or other (e.g., on-demand and/or achievement-based) uploads, a user may be able to see his or her ranking or rankings relative to others in real-time or near real-time.

[0024] Another component represented in FIG. 1 is a component 118 that expresses the effort in terms of equivalent other activities, that is, outputs a representation of equivalent effort for at least one different physical activity. For example, someone who exerts E amount of effort (measured in effort duration, e.g., E=300 minutes) running on a treadmill can see that this amount of effort corresponds to F (some actual number of) minutes of walking with crutches, G minutes of rock climbing, H minutes of an uphill hike with a forty pound load, I minutes of vigorous canoeing, J meters of moderate cross country skiing, K meters of swimming, and so on.

[0025] A server-side "economy" component 119 may provide for incentives and/or rewards based upon achievements and/or competition results. Where legal, the economy component 119 may facilitate ways for competitors I participants to wager between themselves. Compensation also may be in game or in competition, e.g., rewards, points "goods" or the like that are desirable to have during the game or competition, or for future ones. Note that to prevent fraud where rewards and/or other compensation are provided, verification of identity and other mechanisms may be used to ensure that the correct person is actually participating, and that the person is actually putting forth the effort (and not just electromechanically simulating the activity, for example).

[0026] As can be readily appreciated, one or more other server-side components (represented by block 120) may be provided to facilitate individual and/or group usage of the effort-based data.

[0027] Turning to the use of effort duration as a measure of effort, as is known, a common calorie formula is:

$$\text{calories} = \text{MET} * (\text{BMR} / 1440) * \text{duration}$$

where MET is metabolic equivalent, comprising published values, published by various sources, that provide a reasonable estimate of the ratio of a physical activity relative to an at rest "activity" for various activities; (thus, for example, moderate jogging has a higher MET value than slow walking). BMR is basal metabolic rate, a well-known computation corresponding to a person's energy spent while at rest. The value 1440 is the number of minutes in a day.

[0028] Effort duration is described herein as:

$$\text{Effort duration} = (1440 * \text{calories}) / \text{BMR}$$

$$\text{Effort duration} = \text{MET} * \text{duration}$$

[0029] This effort duration value gives a much more accurate representation of the underlying effort, in that the computed effort is based upon an intensity, e.g., the MET value as a factor, mathematically combined with (e.g., multiplied by) the duration. For example, consider two people with different HWAG properties, corresponding to different BMR's, who

each exerted some amount of effort that burned **200** calories, e.g., the BMR's (using a typical well-known formula) for the two people are:

[0030] Person A: 177 cm, 100 kg, 35 year old, male, has a BMR of 1936.25

[0031] Person B: 177 cm, 125 kg, 35 year old, male, has a BMR of 2186.25.

[0032] The effort durations for the two people are:

[0033] Person A: effort duration= $(1440*200)/1936.25=148.74$ minutes

[0034] Person B: effort duration= $(1440*200)/2186.25=131.73$ minutes.

[0035] The above computations indicate that Person A had to work much harder to burn the same calories as Person B. Indeed, if Person B had put forth the same effort as person A, namely measured as an effort duration of 148.74 minutes, Person B would have instead burned almost 226 calories. As can be seen, weight, which is the single most influential factor in calories burned, makes calories burned an unfair representation of effort. Instead, effort duration, which is HWAG-independent, may be used to express the effort in terms of any activity for meaningful comparisons between players, whereby everyone has a fair chance at winning. Note that calories may be used as a measure of effort (the effort data), but for a fair competition, each person needs an individual (and typically different) number of calories to burn based on his or her individual HWAG properties, for example.

[0036] In addition to allowing for more meaningful comparisons between individuals, effort duration also allows meaningful comparisons between different activities, and for expressing effort in terms of those other activities. The effort duration can be divided by the MET of any activity to determine how much time would be spent doing another activity. As another example, a 36 year old, 177 cm tall male weighing 100 kg who had burned 800 calories would have an effort duration of approximately 503 minutes. Any activity with an established MET value may then be shown to the user as an equivalent, e.g., using some of the example activities mentioned above, this can be shown as so many minutes of walking with crutches, rock climbing, an uphill hike with a certain load, and so on.

[0037] Note that the above way to measure effort is substantially HWAG-independent. However, other ways to measure effort may eliminate only some of the HWAG properties, e.g., weight and height; competitions may be then limited to persons of the same other factors, e.g., eliminate weight and height from the effort data measure, and then conduct a competition only between persons of the same gender and age.

[0038] FIGS. 2A-2C represent example data that may be shown to a user via a suitable user interface. FIG. 2A shows a current leaderboard for an example race, with leadership determined in any way, e.g., in actual distance, or in effort duration. FIG. 2B shows an overall leaderboard for an example total fitness challenge, with effort shown in the form of climbing a mountain; different equivalents may be selected via button interaction in this example. FIG. 2C shows an example of various equivalents in effort duration (in minutes) corresponding to a user's exercise; (note that the example values shown are not necessarily exact). In this example, the user may customize which equivalent activities are shown, and/or in which order, and when appropriate may scroll among any number of activities, including non-sports activities such as cooking, vacuuming carpets, and so forth. As can be readily appreciated, FIGS. 2A-2C are only simplified

examples for conveying how effort-based fitness/challenge data may be presented to a user; numerous other user interface formats, with various information, may be used instead of or in addition to these examples.

[0039] FIG. 3 is a flow diagram showing example steps related to the use of effort duration in an example scenario. At step 302, the identity of the user is obtained. Note that this may be via a log-in or the like that is accepted as trusted, such as for informal competitions. Alternatively, particularly in a competition where rewards are at stake, the user's identity may be more carefully checked to prevent fraudulent competitors, e.g., via biometric fingerprint/retina scanners, facial recognition and so forth.

[0040] Step 304 represents looking up the date or the like of any persisted information for the identified user, such as the HWAG-related data, and the user's current competition data. This data may be maintained locally, or remotely, or some combination thereof. If the HWAG data is recent as evaluated at step 306, the HWAG data is accessed at step 308 and used to generate the BMR of the user at step 312. Note that BMR may be maintained directly. Because a user's HWAG properties can change, particularly weight (and height for a growing user), stale data may be confirmed/updated at step 310. Note that if no persisted data exists for the user, or if a user does not want to use earlier data (e.g., because of a rapid weight change), a user also may directly enter such data as represented by the dashed line from step 302 to 310.

[0041] Step 312 represents generating the BMR of the user. BMR may be used for other purposes, including calories burned computations. While calories burned is orthogonal to effort duration and not a fair measure of effort in fitness competitions, it may be used in many other ways, and is thus valuable to many users.

[0042] Step 314 represents starting the recording of effort for an activity, e.g., corresponding to the application. Step 316 represents computing the effort, which may be an average, a total, and/or another mathematical combination.

[0043] Note that the MET value may change during an activity, and thus the effort duration is not necessarily directly proportional to time. For example, a user on a treadmill coupled to the gaming console may start at a low incline and at a low speed, corresponding to one MET value, and then increase the incline and/or the speed, corresponding to a different MET value. Indeed, with treadmills (or stationary bicycles) that automatically change incline (or pedal resistance) to simulate actual terrain, the MET values may change often.

[0044] Also represented at step 316 is the (optional) reporting of current effort data, e.g., to the network. Step 316 repeats as often as appropriate until the physical activity (or activities) are done, and thus such reporting may, for example, be periodic, e.g., every ten seconds, at a milestone, e.g., every 100 feet climbed, and/or on demand, e.g., when a user wants to see his or her status. This allows a user (as well as other users) to see relative progress, such as in rankings. For example, a user who runs faster can see himself or herself pass other runners, including currently racing runners, and/or see total distance relative to other runners' total distances, even runners not currently running.

[0045] Reporting also may be used to provide players with a view of what game modes, or moments in a game resulted in the most effort. This may be particularly useful in post-analysis, e.g., telling the player where his or her effort lagged, or

was the best, and so forth. Comparisons against previous sessions may be made as well.

[0046] Step 318 represents ending the recording of effort, such as when the user stops the activity. Step 320 reports the total effort to the network or the like, (in cases where the optional reporting is not being done or the activity ends before the next report was submitted). Step 322 represents repeating the process for another activity if desired, e.g., a user may move from doing pushups to doing sit-ups as the next phase of a calisthenics application.

[0047] As can be seen, competitions and challenges are one way that effort may be used to measure a person's accomplishments. Another way to use effort is in medical and similar health scenarios. For example, a doctor or therapist may prescribe that a person put forth some amount of effort in injury rehabilitation. Insurance companies may reduce premiums with proof of consistent effort. Via the network, the doctor, therapist or insurance company can remotely monitor the effort put forth, without necessarily needing heart rate monitoring equipment or the like.

EXAMPLE OPERATING ENVIRONMENT

[0048] It can be readily appreciated that the above-described implementation and its alternatives may be implemented on any suitable computing device, including a gaming system, personal computer, tablet, DVR, set-top box, Smartphone, wearable lifestyle devices and/or the like. Combinations of such devices are also feasible when multiple such devices are linked together. For purposes of description, a gaming (including media) system is described as one exemplary operating environment hereinafter.

[0049] FIG. 4 is a functional block diagram of an example gaming and media system 400 and shows functional components in more detail. Console 401 has a central processing unit (CPU) 402, and a memory controller 403 that facilitates processor access to various types of memory, including a flash Read Only Memory (ROM) 404, a Random Access Memory (RAM) 406, a hard disk drive 408, and portable media drive 409. In one implementation, the CPU 402 includes a level 1 cache 410, and a level 2 cache 412 to temporarily store data and hence reduce the number of memory access cycles made to the hard drive, thereby improving processing speed and throughput.

[0050] The CPU 402, the memory controller 403, and various memory devices are interconnected via one or more buses (not shown). The details of the bus that is used in this implementation are not particularly relevant to understanding the subject matter of interest being discussed herein. However, it will be understood that such a bus may include one or more of serial and parallel buses, a memory bus, a peripheral bus, and a processor or local bus, using any of a variety of bus architectures. By way of example, such architectures can include an Industry Standard Architecture (ISA) bus, a Micro Channel Architecture (MCA) bus, an Enhanced ISA (EISA) bus, a Video Electronics Standards Association (VESA) local bus, and a Peripheral Component Interconnects (PCI) bus also known as a Mezzanine bus.

[0051] In one implementation, the CPU 402, the memory controller 403, the ROM 404, and the RAM 406 are integrated onto a common module 414. In this implementation, the ROM 404 is configured as a flash ROM that is connected to the memory controller 403 via a Peripheral Component Interconnect (PCI) bus or the like and a ROM bus or the like (neither of which are shown). The RAM 406 may be config-

ured as multiple Double Data Rate Synchronous Dynamic RAM (DDR SDRAM) modules that are independently controlled by the memory controller 403 via separate buses (not shown). The hard disk drive 408 and the portable media drive 409 are shown connected to the memory controller 403 via the PCI bus and an AT Attachment (ATA) bus 416. However, in other implementations, dedicated data bus structures of different types can also be applied in the alternative.

[0052] A three-dimensional graphics processing unit 420 and a video encoder 422 form a video processing pipeline for high speed and high resolution (e.g., High Definition) graphics processing. Data are carried from the graphics processing unit 420 to the video encoder 422 via a digital video bus (not shown). An audio processing unit 424 and an audio codec (coder/decoder) 426 form a corresponding audio processing pipeline for multi-channel audio processing of various digital audio formats. Audio data are carried between the audio processing unit 424 and the audio codec 426 via a communication link (not shown). The video and audio processing pipelines output data to an A/V (audio/video) port 428 for transmission to a television or other display. In the illustrated implementation, the video and audio processing components 420, 422, 424, 426 and 428 are mounted on the module 414.

[0053] FIG. 4 shows the module 414 including a USB host controller 430 and a network interface (NW I/F) 432, which may include wired and/or wireless components. The USB host controller 430 is shown in communication with the CPU 402 and the memory controller 403 via a bus (e.g., PCI bus) and serves as host for peripheral controllers 434. The network interface 432 provides access to a network (e.g., Internet, home network, etc.) and may be any of a wide variety of various wire or wireless interface components including an Ethernet card or interface module, a modem, a Bluetooth module, a cable modem, and the like.

[0054] In the example implementation depicted in FIG. 4, the console 401 includes a controller support subassembly 440, for supporting four game controllers 441(1)-441(4). The controller support subassembly 440 includes any hardware and software components needed to support wired and/or wireless operation with an external control device, such as for example, a media and game controller. A front panel I/O subassembly 442 supports the multiple functionalities of a power button 443, an eject button 444, as well as any other buttons and any LEDs (light emitting diodes) or other indicators exposed on the outer surface of the console 401. The subassemblies 440 and 442 are in communication with the module 414 via one or more cable assemblies 446 or the like. In other implementations, the console 401 can include additional controller subassemblies. The illustrated implementation also shows an optical I/O interface 448 that is configured to send and receive signals (e.g., from a remote control 449) that can be communicated to the module 414.

[0055] Memory units (MUs) 450(1) and 450(2) are illustrated as being connectable to MU ports "A" 452(1) and "B" 452(2), respectively. Each MU 450 offers additional storage on which games, game parameters, and other data may be stored. In some implementations, the other data can include one or more of a digital game component, an executable gaming application, an instruction set for expanding a gaming application, and a media file. When inserted into the console 401, each MU 450 can be accessed by the memory controller 403.

[0056] A system power supply module 454 provides power to the components of the gaming system 400. A fan 456 cools the circuitry within the console 401.

[0057] An application 460 comprising machine instructions is typically stored on the hard disk drive 408. When the console 401 is powered on, various portions of the application 460 are loaded into the RAM 406, and/or the caches 410 and 412, for execution on the CPU 402. In general, the application 460 can include one or more program modules for performing various display functions, such as controlling dialog screens for presentation on a display (e.g., high definition monitor), controlling transactions based on user inputs and controlling data transmission and reception between the console 401 and externally connected devices.

[0058] The gaming system 400 may be operated as a standalone system by connecting the system to high definition monitor, a television, a video projector, or other display device. In this standalone mode, the gaming system 400 enables one or more players to play games, or enjoy digital media, e.g., by watching movies, or listening to music. However, with the integration of broadband connectivity made available through the network interface 432, gaming system 400 may further be operated as a participating component in a larger network gaming community or system.

Conclusion

[0059] While the invention is susceptible to various modifications and alternative constructions, certain illustrated embodiments thereof are shown in the drawings and have been described above in detail. It should be understood, however, that there is no intention to limit the invention to the specific forms disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention.

What is claimed is:

1. A method performed at least in part on at least one processor, comprising, sensing a physical activity, recording effort data representing effort used in performing the physical activity, including computing the effort data based at least in part on intensity and time duration of performing the physical activity, and using the effort data in a comparison.

2. The method of claim 1 wherein computing the effort data based at least in part on intensity and time duration of performing the physical activity includes mathematically combining a metabolic equivalent (MET) value corresponding to the intensity of the physical activity with the time duration of performing the physical activity.

3. The method of claim 1 wherein computing the effort data based at least in part on intensity and time duration of performing the physical activity includes mathematically combining a metabolic equivalent (MET) value corresponding to the intensity of the physical activity with the time duration of performing the physical activity, and combining the result with at least one other result that is based upon an intensity and time duration of performing at least one other physical activity to obtain the effort data.

4. The method of claim 1 wherein using the effort data in the comparison comprises providing a competition that includes effort obtained from a plurality of users as a gauge of accomplishment for each user.

5. The method of claim 1 wherein using the effort data in the comparison comprises providing a game in which the effort data corresponds to success in the game.

6. The method of claim 1 wherein using the effort data in the comparison comprises outputting a representation of equivalent effort for at least one different physical activity.

7. The method of claim 1 wherein using the effort data in the comparison comprises evaluating medical-related progress.

8. The method of claim 1 wherein using the effort data in the comparison comprises outputting a representation of a leaderboard showing a plurality of users as ranked in a competition.

9. The method of claim 1 wherein using the effort data in the comparison comprises outputting a representation of a real-time or near real-time leaderboard showing a plurality of users as ranked while participating in a competition.

10. The method of claim 1 wherein using the effort data in the comparison comprises providing a reward based upon the effort data.

11. In a computing environment, a system comprising, a competition component coupled to a plurality of computing devices via one or more network connections, the competition component configured to receive data from each computing device corresponding to a participating user in a competition, including effort duration data that represents an amount of physical activity exerted by the participating user over a time duration, in which the amount is based at least in part upon intensity of the physical activity, and the competition component configured to process the effort duration data to determine which participating user has exerted the most effort with respect to the competition.

12. The system of claim 11 wherein each computing device includes an effort module useable by one or more applications to obtain a representation of effort exerted by a user.

13. The system of claim 11 wherein the plurality of computing devices comprise gaming consoles, mobile computing devices, personal computers, or a combination thereof.

14. The system of claim 11 wherein the competition component is implemented in a server-side computing environment, the server-side computing environment further comprising a leader component configured to show rankings for standing in an overall fitness competition, rankings for standing in a current fitness competition, or both, based at least in part upon the effort data.

15. The system of claim 11 wherein the competition component is implemented in a server-side computing environment, the server-side computing environment further comprising an equivalent effort component configured to show a representation of equivalent effort for at least one different physical activity based at least in part upon the effort data.

16. The system of claim 11 wherein the competition component is implemented in a server-side computing environment, the server-side computing environment further comprising an economy component configured to manage compensation based at least in part upon the effort data.

17. One or more computer-readable media having computer-executable instructions, which when executed perform steps, comprising,

obtaining identity data of a user;

recording effort duration data corresponding to effort exerted for a time duration with respect to at least one physical activity performed by the user, in which the effort exerted for each activity includes a factor representative of an intensity of that activity; and

outputting the effort data and the identity data to a remote entity for use in a comparison against other effort duration data.

18. The one or more computer-readable media of claim **17** wherein outputting the effort data and the identity data comprises outputting information corresponding to a total effort when the at least one physical activity is complete.

19. The one or more computer-readable media of claim **17** wherein outputting the effort data and the identity data comprises outputting information corresponding to an in progress effort report when the at least one physical activity is continuing.

20. The one or more computer-readable media of claim **17** having further computer-executable instructions comprising, using the effort data to manage a competition that includes the user and at least one participant, or to evaluate progress of the user against at least one fitness-related goal.

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