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(54) Title: AN INTERACTIVE SYSTEM FOR PROVIDING PSYCHOLOGICAL STIMULATION TUNED TO PERSONAL ISSUES AND TO A USER PERSONAL PROFILE, AND A METHOD FOR USE THEREOF

(57) Abstract: The present invention relates to an interactive system for providing mental stimulation tuned to personal issues, to a person in need of resolving such an issue, comprising (a) a multimedia system with an interactive interface for accepting verbal and non-verbal input from the person and for representing the system output; (b) a knowledge database; (c) storage means for storing the input and database; (d) means for analysing the input in order to define the personal profile, the characteristic psychological issue and the affection situation of the user; (e) means for selecting relevant elements from the database according to the definitions arrived at by the analysis, which when presented to the user, as the system output, will provide him mental stimulation; (f) means for adapting the selected elements to the personal issue as defined by the analysis; (g) means for activating the user to define his reactions toward the system output in order to enhance an explication process leading eventually to overcoming mental blocks associated with the personal issue.
AN INTERACTIVE SYSTEM FOR PROVIDING PSYCHOLOGICAL STIMULATION TUNED TO PERSONAL ISSUES AND TO A USER PERSONAL PROFILE, AND A METHOD FOR USE THEREOF

FIELD OF THE INVENTION
The present invention relates to an interactive artificial system useful for providing psychological aid by tuned neural stimulation and cognitive feedback, and to a method for use thereof. More specifically the present invention relates to an interactive computer device which provides psychological aid by enabling the person interacting with said device to overcome neural blocks and to arrive faster at new and non-standard insights and decisions in various situations when a person is facing psychological pressure, problem or issue.

BACKGROUND OF THE INVENTION
Attempts to provide self-improvement aid for resolving personal problems are made in various environments and with various purposes. For example, US Patent no. 5790129 discloses a method for self-improvement by mental stimulation addressed towards user-defined goals like coping with diseases or enhancing athletic abilities of a person. US Patent no. 5813863 describes an interactive system for promoting awareness and for changing high-risk behaviour.

However, very often a human is suffering from less evident problems, like uncertainty of environment and of means for forming and achieving personal goals, where even the goals themselves may be uncertain and contradict to each other. For example, a specific personal goal is unattainable; loss of opportunity; a decision that must be taken under a time pressure or when too much information should be taken into account; fear of the risks involve in a planned action or of a coming event. Even situations supposedly being well-being situations, like promotion at work, might cause unexpected oppressive feelings. Such situations
involve psychological pressure and as a consequence, neural blocks that screen out mental resources which can help forming optimal behaviour. The emotional state of a person in such situations can be unstable, depending on the moment and his (her) state of mind, and a single and possibly simple stimulus such as a word, a phrase or an image, can help him gain a new insight of his situation and arrive at a new decision. Consequently, the emotional, mental and even physical state of the person may be significantly improved.

In such situations, it is customary to need verbal help from somebody who understands this psychological state, knows about the person’s environment and problems, is amiable towards the person, has independent thinking and knowledge, and is respected by that person. Traditionally, elderly persons, relatives or friends provide this verbal help. Thoughts, expressed in books written by wise authors, may also help, but these resources are often unavailable and even if they are, it might take a long time and much effort to find and absorb what is necessary for the given moment.

The existing artificial systems and methods are either too general or are aimed toward specific problems and have a rigid structure which guides the user along defined routes through selection menus. These systems cannot provide relief in situations where the user’s problem is not well defined or clear to him. Moreover, the existing systems do not pay enough attention to the importance of stimulating abstract thinking as a means of recruiting resources for resolving personal problems. Stimulation of thinking allows the establishment of new neural connections and/or bypassing of existing neural blocks, thus it helps to achieve new insights and to arrive at new and non-standard insights, decisions and actions. Such a stimulation can be provoked by verbal and non-verbal stimulus, for example images from literature and art. Matching mental images of personal concepts and problems to known images from literature and art can stimulate a process of clarification which helps the user to formulate and define his problem and to find new ways to make progress.
It is the purpose of the present invention to provide a new interactive system for providing an intelligent help and relief, in depressing and challenging situations, by automatic means. The system of the present invention makes use of techniques of active verbal and non-verbal communication between a human and artificial system, addressing and stimulating his abstract thinking, and creating new neural connections necessary for solving personal problems and issues. The user is placed in a friendly and intelligent environment, that produces and admits more verbal activity and creativity from the user’s part than any existing environment.

The interactive system of the present invention has some features of a human advisor and in addition has the advantages associated with a computer system, i.e., infinite patience, complete privacy, the possibility to store enormous amounts of knowledge, fast processing of data and fast retrieval of data from a database.

Unlike existing systems, the system of the present invention does not follow deterministic paths along selection menus, but has a virtually unlimited number of routes which vary dynamically during the interaction with the user and continuously evolve as the system learns to better suit the user. Thus, two users, starting the interaction with the present system, by phrasing exactly the same issue, will soon follow divergent routes.

Also, unlike existing system, the system of the present invention does not just offer the user solutions selected from a solutions bank but rather stimulates the user to undergo an explication process leading to mental clarification and improvement.

SUMMARY OF THE INVENTION

The present invention relates to an interactive system for providing mental stimulation tuned to personal issues, to a person in need of resolving such an issue, comprising; a multimedia system with an interactive interface for
accepting verbal and non-verbal input from said person and for representing the system output; a knowledge database; storage means for storing said input and database; means for analysing said input in order to define the personal profile, the characteristic psychological issue and the affection situation of the user; means for selecting relevant elements from said database according to the definitions arrived at by said analysis, which when presented to the user, as the system output, will provide him mental stimulation; means for adapting said selected elements to the personal issue as defined by said analysis; means for activating the user to define, refine and solidify his reactions toward said system output by graphical and by verbal means, in order to enhance an explication process leading eventually to overcoming mental blocks associated with said personal issue.

The multimedia system can be a standalone computer, or a computer with an access to a local network or to the internet, or a pocket calculator, or an electronic game, or an electronic telephone or a wearable computer.

The means for analysing the input of a user in order to define a personal profile of said user comprises semantic network which determines relation of input text elements to specific psychological concepts of affection; a measure of relevance of said concepts of affection to said personal issues and a relationship map for representing said personal issue. The means for analysing the user input in order to define his personal issue and affection situation are consisting of verbal and non-verbal analysis, comprising one or more of: paraphrasing input phrases and sentences; detecting previous, unfinished and deleted fragments of said input; response time analysis of said input; finding special text patterns in said input; and allowing the user to highlight specific sub-phrases of the input, which he regards as most important;

The knowledge database according to the present invention comprises verbal and non-verbal elements, wherein each of said elements can be related to plurality of personal issues for plurality of persons and to plurality of affection situations. Said
elements can be selected and adapted from one or more of the following: short text fragments, art fragments, cartoon fragments, life recommendations, intelligent advises, short scenarios and sounds, activities, references and short movies etc. The means for selecting a relevant element from the database to be presented as the system output comprises measure of relevance, which determines relation of an element of said knowledge base to the personal profile, psychological issue and affection situation of the user as defined by the system and inference rules, comprising interrelationship between elements of the semantic network.

The interactive system further comprises means for tuning successive outputs of said system to the user’s previous inputs by: keeping track of previous user’s input and taking it into account while calculating preferences for possible answers; avoiding the use of a subset of the knowledge base as a source for possible output wherein said subset is characterised by having a feature which produces non-positive user response; tuning successive sessions with the same person for producing different answers if said person comes with the same issue; means for reminding the user of the system existence, after a predetermined time passed since the last session or when the system detects that the person needs help.

The system can also comprise means for on-line help which is tuned to the user’s behaviour within the system in the form of explanation and references related to the output given by the system and by relevant examples.

The means for representing the selected element from the database as an output comprise: symbolic cartoon-style personages, related to specific concepts of affection, presenting text on screen by said cartoon-style personages and comics-style text frames, fonts and music; simultaneous presenting of the corresponding text in a voice form; simple cartoon fragments, demonstrating the ideas of the related knowledge base elements or of the corresponding affection situations; cartoon-style characters, produced by the system, for exposing information and related to the meaning of said information;

The interactive system of the present invention can further comprise means for
monitoring and tracing personal self-improvement and mental progress wherein a personal log data are stored, along with suggested automatic evaluation and user's evaluation of the corresponding sessions. The interactive system of the present invention can be aimed specifically to a specific population, by adapting the knowledge base and the means for analysing the user's input and selecting the system output, to that specific population.

The present invention further relates to a method for providing psychological and mental stimulation tuned to a personal issue and to a person in need of resolving said issue, comprising at least one session of said person with the interactive system of the present invention, wherein each session comprises at least one interaction and wherein each interaction comprises a) entering of verbal input by the user, b) analysis of said input by the system, c) selection and presentation of a system output according to said analysis results, d) evaluation and summary of said output by the user by verbal and non-verbal means. The first step of the system can be an invitation to the user to explicate his personal issue and his attitude to said issue and to represent said issue and attitude to the system as verbal input. According to a preferred embodiment of the present invention the system presents a plurality of images wherein each image represents an advisor of a characteristic type and the user selects an image to whom he addresses his input and the system monitors this selection and uses it as one of the parameters that facilitates building up of the user personal profile. According to the present invention each session can terminate by activating the user to summarise his reactions toward the whole session and to evaluate the mental and behavioural improvement he achieved.

DETAILED DESCRIPTION OF THE INVENTION
The present invention introduces a general approach to improvement of various personal functions related to mood, emotional intelligence, living skills, handling problematic issues, vitality, and personal success.
One of the main improvement factors, addressed here, is avoidance or bypassing of neural blocks, which lock out brain centres thus preventing satisfactory decision and action in challenging or depressing situations. The applied technique of improvement is closely related to verbal activity and abstract thinking of an individual. As a valuable side effect, this technique boosts verbal activity and abstract thinking and may be applied in various environments related to handling behavioural problems, to arriving at a satisfactory decision in a complex and unfriendly life situation, as a mental self-improvement assistant, as a versatile friend for entertainment, for study, etc.

Embodiments of the invention may be applied in various technical environments: as a standalone program-adviser, as part of a game, which makes the game more interesting and useful, as an assistant in an educational program, as an intelligent addition to a telephone or a pocket calculator, as a friendly chat partner in the Internet, in combination with various physiological sensors, etc.

Methods of psychological characterisation of a person are introduced. These methods are based on input text, written by the person, and on non-verbal analysis of the interaction process.

Some embodiments of the invention may be applied for attracting attention of a person by exposing highly intelligent information, closely relevant to the person's inner world and to specific psychological features of the person.

Another perspective aspect of the invention is improving information absorption by a person. Modern computerised education assistants (e.g. programming language tutorials, physics courses) represent a host of very complex texts and constructs, thus placing a person in an unfriendly situation. Education success depends on a learner's ability to involve additional neural centres, which were not addressed by the author of a tutorial, but relate specific concepts of the learned subject to specific personal concepts of an individual learner. The invention provides the necessary neural links along with other links that may boost ability of generalisation, alert solution finding, and strengthen the learner's memory.
One important aspect of the present invention is tracing the progress of a person by storing the sessions results in a form of a personal log file, which contains session dates, session details, and session evaluation data. The personal log file can be exposed to the person himself or, upon his permission, to a counsel or to any other person he is interested in exposing it to. The personal log file can also serve as an example and teaching aid for other users of the system as part of the knowledge base. Storing personal log file can also serve as means to connect between persons facing same issues upon their agreement in order to provide additional help.

In the context of the present invention the following Definitions are used:

Knowledge Base of text and art items: Plurality of specially collected text data, pictures, special sounds, music images, short movies, referrals, games, programmed activities, etc. which highlight addressed situations and affection concepts when exposed to a person. Elements of said Knowledge Base may be annotated and/or linked by one or more special affection terms contained in the Affection Semantic Network.

Memory of Knowledge Base items: Storage for storing said Knowledge Base. Access to this memory is done associatively via said situation and affection terms.

Personal profile of the user: Formal description of an individual user in terms of his issues and affection preferences.

Personal key of the user: element of said personal profile.

Method of ranking relevance of a Knowledge Base item to a personal key: Special measure calculated in the course of affection inference.

Method of arranging relevant Knowledge Base items by a rank of relevance to a person's issue: linear arrangement in accordance to said ranking relevance of a Knowledge Base item to a personal key.

Direct access to a related Knowledge Base item using personal profile:
Access using said access to memory of Knowledge Base items.

*Concepts of affection:* Special psychological concepts that define inner world features and preferences of a person.

*Concepts of situation:* Special psychological concepts that define external world features and conditions of a person.

*Situation/Affection Semantic Network:* Plurality of said concepts of affection and situations, attached to nodes of specially formed graph.

*Verbal and non-verbal communication:* Interface between the user and artificial system, in which explicit data (message texts, voice, images or sounds) are accompanied with timing data, erased temporary data, prosody, measured physiological signals and other information that may be elicited or created in the process of forming said explicit data.

*Affection calculus:* Special logic calculus containing rules of affective inference.

*Affective inference:* Formal process, representing algorithmic model of establishing a possible new neural link via verbal activity, visual stimulation generalisation, or matching intuitive images.

Furthermore, the terminology appearing in the description of the present invention is used with the following meaning:

**Glossary**

*Personal issue:* A personal problem, dilemma, challenge or a conflict situation that can be described by words and/or can be detected from non-verbal activity of a person. Any status of a person in which he (she) feels discomfort and looks for a way to create status in which he (she) feels comfort.

*Psychological aid:* Exposing any information that may clarify said personal problem and/or cause the person to find a way to progress towards resolving the problem.
Life recommendation: Recommendation of how to interpret a certain situation, or how to think about it or how to behave in it.

Intelligent advice: Life recommendation made directly or indirectly, via metaphor, examples, hints, plan description, or other information that may help in planning or facilitating effective personal behaviour.

Mental help: Activity that improves mental state of a person.

Intelligence boost: Improving of personal intelligence.

Intelligence Speed and effectiveness of dealing with issues

Personal attention: Ability of a person to concentrate on and cognise specific kind of information.

Personal activity: Ability of a person to change his (her) behaviour and (or) internal and external world in order to resolve personal or other problems.

Personal memory: Ability of a person to store and restore (possibly complex) images of what was cognised in previous study, behaviour, communication, or other experiences.

Personal vitality: Ability of a person to successfully survive and feel comfortable in complex situations that may cause personal problems and to have relatively high ability to resolve personal problems.

Personal success: Personal vitality and positive estimation and (or) self-estimation of the above.

Intelligent reaction of a person: Ability of a person to promptly comprehend complex informational environment and correspondingly behave therein.

Affection situation: Cognition of personal issues that cause strong emotional feelings, possibly negative.

Personal ability to study: Ability of a person to cognise verbal descriptions and non-verbal data related to a subject.

Personal interest in a subject: Personal state that may cause ability to study the subject.
Neural block: Inability to access existing internal resources. Concentration of a person in a plan or an image or other subject that contains a paradox, a deadlock, conflicting beliefs or values or other illogical feature that prevents or slows down the resolution of a personal problem.

Personal ability to avoid neural blocks: Ability of a person to cognise self-status as leading to said neural block and to change this status to a status that does not contain said neural block.

Intelligent guiding of a person in an environment: Exposing information or other data to a person, wherein exposed items are related to current state of the person.

Current state of a person: Personal problems and/or subjects that are currently cognised or mentally reflected in the person.

Verbal description: Process and result of composing natural language text describing personal problems or other data.

Non-verbal cognition: Process and result of reflecting something in a person, wherein verbal description may or may not exist.

Characteristic personal issues: Important and or recurring personal issue or issues along with the external factors that supposedly cause them.

Psychological model of a person: Formal description of characteristic personal issues and other personal data.

Verbal and non-verbal analysis: Automatic processing of results of verbal and non-verbal activity that leads to construction and refining of said psychological model of a person.

Specific psychological concepts of affection: verbal descriptions of basic emotions and other affection situations.

Non-verbal communication with the user: Interaction between an artificial system and a human without using words of a natural or artificial language.

Explication of a personal problem: Forming written and/or oral description of a problem, which can be understood by another person or artificial system.
**Real or artificial adviser:** Another person or artificial system that is able to input said explication of personal problem and provide information that may cause said psychological aid.

**DESCRIPTION OF THE DRAWINGS**

**Fig 1:** Mental self-improvement aid: 1 -- Cognition process relating to a personal issue: reflection of a problem; 2 -- attempt to solve the issue; 3,4 -- constantly changing links to dynamically changing neural centres; 5 -- explication of the issue; 6 -- function of the system for improving 3,4 and 2.

**Fig 2:** Information flow. 1 -- explication of the issue; 2 -- creation of a personal profile for connecting to semantic network; 3 -- affection reasoning for finding affection concepts related to a personal issue; 4 -- finding Knowledge Base items related to the affection concepts; 5 -- adaptations and presentation of Knowledge Base items.

**Fig 3.** Possible embodiments of representing user reactions on the stimuli. The user can evaluate status of his (her) issue using special gauges: Calmer -- More frustrated; Clearer -- More Confused; Heavier -- Lighter; Weaker -- More Energetic. In addition to using graphical gauges the user is prompted to present his reaction in a verbal form using his own phrasing.

**Fig 4:** Localisation of a possible neural block. 1 -- determination of negative affection concepts; 2 -- specification of the block for the personal issue.

**Fig 5:** Establishing new neural connection 2-3-4 to avoid neural block 1. 1 -- localisation of a neural block; 2,3 -- affection inference for bypassing blocked links in the semantic network by an intermediate concept; 4 -- determination of a stimulating concept for the issue.

**Fig 6:** Summary of the session. User determines that: 1 -- he (she) resolved a problem and formed a new behaviour. This may involve change of behaviour in
the outside world (decision; calling someone for help; starting an action etc.); 2 – he (she) experiences some internal change. This may involve clarification of values, learning of something new etc.; 3 -- he (she) changed his concept of the issue. This may lead to understanding that it was "non-issue", to redefining the issue, to realising new personal issues etc. Three special sets of parameters are suggested for summarising the session. The parameters correspond to the following situations:

a) Issue: Clarified; Broken Down; Redefined; Generalised; Dissolved.

b) Internal State: Improved Mood; Balanced Energy; Better Proportion; Identified Context; Learning; More Harmony; Modified Goals; Clarified Values.

c) Objective: Started Action; Identified New Direction; Recruited External Resources; Co-operation; Established Communication.

Summarising the session is done in a dialog form. Parameters, described here, are related to specially designed gauges that enable the user to easily summarise the session. Verbal summary highlights insights, decisions and actions.

**Fig 7.** Flow chart of interactive system sessions. The picture illustrates preferred embodiments of dialog options of the interactive system.

At the beginning, the user, who does not have experience of self-improvement with the proposed technology, may be too confused to write something really important for him: he may be sceptical, non-interested, not serious etc. The system actively invites the user to discuss his authentic personal issues by a helping suggestion such as "tell something about your issue". This suggestion should be specified for making the concept of "issue" less ambiguous and provoking versatility of the user..

User reaction (verbal and non-verbal) on these questions is analysed, after which verbal and non-verbal invitation stimuli containing music, cartoon
fragments and other multimedia elements have been suggested. This kind of invitation can be used as a link between the interactive system and other Information Technology (IT) products: games, Computer Aided Instruction (CAI) tools, Internet search engines and chats, text editors, other psychological aid products.

Following is detailed description of how the "user personal profile", the "affection semantic network" and the "affection calculus" are established by the analysis of the user input:

**Technical description of USER PERSONAL PROFILE**

Personal profile represents a vector of values related to the user characteristics. Following are possible examples for such characteristic features:

1. Main personality types and factors:
   - creative, sensitive, lead-by-right-hemisphere; mentor, needing-leader; age, gender, sanguine, melancholic etc.

2. Affection types that describe psychological state for a given moment:
   - worried, feared, self-eaten, dreaming, disappointed, lost, sleepy, etc.

3. General issue description:
   - family problem, job conflict, money problem, ethnic problem, study problem etc.

4. Data describing information environment of a person:
   - religion, music, literature; medicine; merchant, scholar etc.

5. Data describing mental health

6. Rate of English literacy

The vector is formed during analysis of said user input.
Affection/Situation Semantic Network

Affection/Situation Semantic Network contains nodes related to basic affection centres of vitality, frustration, anticipation, recollection, insight, forecast etc. and to specific life situations like sickness, promotion at work or having a new child. When the user describes a personal issue, user personal profile is created or updated. Elements of the user profile have been linked to corresponding nodes of the semantic network.

Affection Calculus and Affective inference

Affective inference, applied here, may be considered as modification of classic deductive and inductive inferences in a logic calculus. Special axioms and inference rules represent the main differences.

Application of a rule to a personal issue can be considered as an algorithmic model of establishing new neural connection in the human brain. Concepts of affection, contained in the semantic network, participate in this inference when related to a personal issue.

Main components of Affection Calculus are related to basic human affection concepts and are described below.

Technical description of Affection calculus

The following example elements of Affection calculus, are described:

Functional constants:

- Fear Of (X)
- Suffering From (X)
- Uncertainty In (X)
- Absurdity Of (X)
Missing (X)
Being Forced By (X)
Being Forced To (X)
Disappointment By (X)
Disappointment In (X)
Over-Concentration In (X)
Impossible Subject (X)
Depressing Recollection Of (X)
Planning To Do (X)
Understanding Of (X)
Recollection Of (X)
Underestimating (X)
Dangerous (X)
Having Good Social Status (X)
Having Bad Social Status (X)
Manic Region (X)
Depression Region (X)

Object Constants

Action,
Happiness, Unhappiness, Anxiety, Acceptance, Fear, Surprise, Sadness,
Disgust, Anger, Expectation, Joy;
Future, Past,
Danger, Money,
Administratively Higher Person, Beloved Person,
Loneliness

Object Variables: Latin letters with or without indices
**Terms.** Standard classic rules for forming terms in a logic calculus are applied.

Examples of ground terms:
- Fear Of (Missing (Social Position))
- Recollection Of (Being Forced By (Beloved Person))
- Fear Of (Being Forced To (Missing (Money)))
- Fear Of (Future)
- Disappointment In (Administratively Higher Person)

Examples of terms with free variables:
- Fear Of (Missing (X))
- Over-Concentration In (Impossible Subject (X))
- Disappointment By (X)
- Suffering From (Recollection Of (Missing (X)))

**Predicate Symbols**

a) Low(X), High(X), Mild(X); Show(X); Invite The User To Describe (X); Discourage >From (X); Encourage To (X);

b) Set of 0-ary predicate symbols, expressed as text constants in quotes, which correspond to nodes in said Affection Semantic Network

**Axioms** of the calculus have been partly collected from the user’s profile and contain a universal part which is called Inference Rules.

The following examples of said inference rules are disclosed:
- If High((Over-Concentration In (Impossible Subject ( X))) then Show (absurdity of (Planning (X)))) ;
- If Low(Self Esteem) then “encourage the user for a planned action”, “raise self-esteem”
- If Dangerous (X) then Discourage From (Planning To Do (X))
If Underestimating (Danger) then
"discourage the user from an action"
If (Underestimating (Friends) then
"induce respect to colleagues/friends"
If (Uncertainty In (Future) then
"induce active position in planned action"
If (Uncertainty In (Understanding Of (X)) then
Invite The User To Describe (X)

EXAMPLES:

Example 1. The user enters text "I am afraid of meeting my employer". The system performs affective reasoning and comes to abstract formulae: Fear Of (Action), Fear Of Missing (Money), Fear Of (Being Forced By (Administratively Higher Person). In said Knowledge Base, the following texts, related to these formulas, are found: 1) "Act as if you are GUARANTEED success and you, eventually, will achieve it!" and 2) "He that wrestled with us strengthens our nerves and sharpens our skill. Our antagonist is our helper". Both responses highlight a new view on the issue and thus provoke new plans, new understanding, new self-esteem, and new insights as to personal behaviour.

Example 2. In affection reasoning, the system comes to abstract formulae Disappointment and Over-Concentration In (Impossible Subject (X). For these formulae, Affection Semantic network has references to texts 1) "The way to love anything is to realise that it might be lost" and 2) "The best way to forget your problem is to help someone else with theirs". New verbal links, generated from these responses, cause new abstractions, new neural links, and help the person detach his attention from inhibiting images and to focus on a more doable activity.
Example 3. Formulas Fear Of (Action) and Fear Of (Future) are deduced from the user's input. The following responses have been suggested: 1) "Abraham Lincoln quipped that the best way to predict your future is to create it!" and 2) "Never give up a dream just because of the time it will take to accomplish it. The time will pass anyway". After this, the person, in his imagination, will place himself in a much more active position than he was before. New neural links lead to stronger or more assertive plans to resolve personal issues.

Example 4. The user complains that he is unhappy. Among other responses, the following response is suggested: "Edith Wharton muses, if only we'd stop trying to be happy we could have a pretty good time". This response helps concentrate personal attention on more realistic subjects than what was vaguely meant in the issue. New neural links will eventually come to something both desirable and attainable, thus helping to resolve the issue.

Preferred embodiments of interactive system:

The following technical environments represent preferred embodiments of the invention:

1. Cellular phone service for psychological aid and mental stimulation wherein said verbal and non-verbal communication with the system is done via voice synthesis and recognition. Intonation, timing and prosodic information of the input is applied for building said user profile.

2. Various Internet servers-advisers, performing either or all functions of the system according to the present invention.

3. Stand-alone computer programs analogous to Internet servers-advisers according to Embodiment 2.

4. Intelligent addition to a computer game, wherein game concepts and game-related behaviour of the user is considered as source for said user input. Said
active verbal and non-verbal answers of the system are also aligned with the game concepts, characters and goals.

5. Wearable computer (embedded into a watch, pocket device, part of a personal garment, etc), wherein computer sensors register said verbal and non-verbal information, which than participate in said user profile.

6. Automatic appendix to a museum guide, which helps the user better understand the museum items and their implications

7. Addition to a CAI program, in which the learned concepts are related to said Knowledge Base.
CLAIMS

1) An interactive system for providing mental stimulation tuned to personal issues, to a person in need of resolving such an issue, comprising;
   a) a multimedia system with an interactive interface for accepting verbal and non-verbal input from said person and for representing the system output;
   b) a knowledge database;
   c) storage means for storing said input and database;
   d) means for analysing said input in order to define the personal profile, the characteristic psychological issue and the affection situation of the user;
   e) means for selecting relevant elements from said database according to the definitions arrived at by said analysis, which when presented to the user, as the system output, will provide him mental stimulation;
   f) means for adapting said selected elements to the personal issue as defined by said analysis;
   g) means for activating the user to define his reactions toward said system output in order to enhance an explication process leading eventually to overcoming mental blocks associated with said personal issue.

2) An interactive artificial system according to claim 1 wherein the multimedia system is a standalone computer, or a computer with an access to a local network or to the internet, or a pocket calculator, or an electronic game, or a wearable computer or an electronic telephone.

3) An interactive system according to claim 1 wherein the means for analysing the input of a user in order to define a personal profile of said user comprising one or more of;
   a) semantic network which determines relation of input text elements to specific psychological concepts of affection;
b) a measure of relevance of said concepts of affection to said personal issues;
c) relationship map for representing said personal issue;

4) An interactive system according to claim 1 wherein the means for analysing the user input in order to define his personal issue and affection situation are consisting of verbal and non-verbal analysis, comprising one or more of:
a) paraphrasing input phrases and sentences;
b) detecting previous, unfinished and deleted fragments of said input;
c) response time analysis of said input;
d) finding special text patterns in said input;
e) allowing the user to highlight specific sub-phrases of the input, which he regards as most important;

5) An interactive system according to claim 1 wherein the knowledge database comprises verbal and non-verbal elements and wherein said elements are short text fragments, art fragments, cartoon fragments, life recommendations, intelligent advises, short scenarios and sounds, activities, references and short movies, and wherein each of these elements can be related to plurality of personal issues for plurality of persons and to plurality of affection situations.

6) An interactive system according to claim 1 wherein the means for selecting relevant elements from said knowledge database to be presented as the system output comprising one or more of:
a) measure of relevance, which determines relation of an element of said knowledge base to the personal profile, psychological issue and affection situation of the user as defined by the system;
b) inference rules, comprising interrelationship between elements of the semantic network as defined in claim 3.
7) An interactive system according to claim 1 wherein the means for activating the user to define his reactions toward the system output are graphical means and verbal means.

8) An interactive system according to claim 1 further comprising means for tuning successive outputs of said system to the user's previous inputs comprising:
   a) keeping track of previous user's input and taking it into account while calculating preferences for possible answers;
   b) avoiding the use of a subset of the knowledge base as a source for possible output wherein said subset is characterised by having a feature which produces non-positive user response;
   c) tuning successive sessions with the same person for producing different answers if said person comes with the same issue;
   d) reminding the user of the system existence after a predetermined time passed since the last session or when the system detects that the person needs help

9) An interactive system according to claim 1 further comprising means for on-line help which is tuned to the user’s behaviour within the system.

10) An interactive system according to claim 9 wherein the on-line help is in the form of explanation and references related to the output given by the system and by relevant examples.

11) An interactive system according to claim 1 wherein the means for representing the selected element from the database as an output are comprising one or more of:
   a) symbolic cartoon-style personages, related to specific concepts of affection,
presenting text on screen by said cartoon-style personages and comics-style text frames, fonts and music
b) simultaneous presenting of the corresponding text in a voice form;
c) simple cartoon fragments, demonstrating the ideas of the related knowledge base elements or of the corresponding affection situations;
d) cartoon-style characters, produced by the system, for exposing information and related to the meaning of said information;

12) An interactive system according to claim 1 further comprising means for monitoring and tracing personal self-improvement and mental progress wherein a personal log data is stored, along with suggested automatic evaluation and user's evaluation of the corresponding sessions, comprising one or more of:
a) means for storing session data and session history;
b) means for tracing the dialog in time and for evaluating effectiveness of the sessions.

13) An interactive system according to preceding claims aimed at a specific population, wherein said knowledge base and said means for analysing user's input and selecting system output are tuned to said specific population.

14) A method for providing psychological and mental stimulation tuned to a personal issue and to a person in need of resolving said issue, comprising at least one session of said person with an interactive system as defined in preceding claims, wherein each session comprises at least one interaction and wherein each interaction comprises a) entering of verbal input by the user, b) analysis of said input by the system, c) selection and presentation of a system output according to said analysis results, d) evaluation and summary of said output by the user by verbal and non-verbal means.
15) A method according to claim 14 wherein the first step is an invitation of the system to the user to explicate his personal issue and his attitude to said issue and to represent said issue and attitude to the system as verbal input.

16) A method according to claim 14 wherein the user selects an image to whom he addresses his input, wherein said image is selected from a plurality of images offered by the system and wherein each image represents an advisor of a characteristic type and wherein the user choice is monitored and stored by the system as a parameter that facilitates building up of the user personal profile.

17) A method according to claim 14 wherein each session further comprises a termination step in which the user is activated to summarise his reactions toward the whole session and to evaluate the mental and behavioural improvement he achieved.
**FIGURE 1**

**FIGURE 2**
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1. Decision/Action: World/User Behaviour changed

2. Internal Shift: Internal world changed

3. Issue Change: Personal issue changed or disappeared

4. No progress achieved

FIGURE 6

The user starts a session with Alive & Well

The user describes an issue

The user chooses character of the responding personage and gets a response or other stimulus

The user produces reaction on the stimulus

Session Summary: the user evaluates the session with Alive & Well

The user finishes the session with Alive & Well

FIGURE 7