Research Paper on "Blue Eye Technology"

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Abstract -- Now a days, technology reached enough that we are sitting in front of our personal computer that can sense and control human emotion known as "BLUE EYE TECHNOLOGY". In this technology the gadgets are used which can sense the emotion level of human body like facial and speech recognition etc. The technology which are used in Blue Eye Technology can understand our emotion at the mouse, it verifies our identity, feel our presents and start interacting with us. In this paper a discussion of new techniques known as Emotion Sensory world of Blue Eye Technology which identify human emotion (sad, happy, surprised) using image processing technique.

Indexed Terms – blue eyes, emotions, images, image processing, sense.

I. INTRODUCTION

Imagine yourself in a world where humans interact with computers. It has the ability to gather information about you and interact with you through special techniques like facial recognition, speech recognition, etc. It can even understand your emotions at the touch of the mouse. It verifies your identity, feels your presents, and starts interacting with you. Human cognition depends primarily on the ability to perceive, interpret, and integrate audio-visuals and sensoring.

II. THE SOFTWARE

Looking after working operators' physiological condition is the main task of Blue Eye System Software. Real time buffering of the incoming data, real-time physiological data analysis and alarm triggering are being performed by the software to show instance reaction on Operator's condition. Several functional modules System core is consisted in The Blue Eyes software which facilitates the flow of transfer between other system modules (e.g. transfers raw data from the Connection Manager to data analyzers, processed data from the data analyzers to GUI controls, other data analyzers, and data. Visualization module provides a user interface for the supervisors. A preview of selected video source and related sound stream the working operator's physiological condition's watching is enabled by this software. Every time the supervisor is instantly signaled on the incoming of alarm messages. The Visualization module can be set in an off-line mode, where all the data is fetched from the database. The supervisor reconstruct the course of the selected information. Adding extraordinary perceptual abilities to computers would enable computers to work together with human beings as intimate partners. Researchers are attempting to add more capabilities to computers that will allow them to interact like humans, recognize human presents, talk, listen, or even guess their feelings. It aims at creating computational machines that have perceptual and sensory ability like those of human beings. It uses non-obtrusive sensing method, employing most modern video cameras and microphones to identify the user's actions through the use of imparted sensory abilities. The machine can understand what a user wants, where he is looking at, and even realize his physical or emotional states.

The BLUE EYES technology aims at creating computational machines that have perceptual and sensory ability like those of human beings. It uses non-obtrusive sensing method, employing most modern video cameras and microphones to identify the users' actions through the use of imparted sensory abilities. The machine can understand what a user wants, where he is looking at, and even realize his physical or emotional states. In the name of BLUE EYES Blue in this term stands for Blue tooth (which enables wireless communication) and eyes because eye movement enables us to obtain a lot of interesting and information.
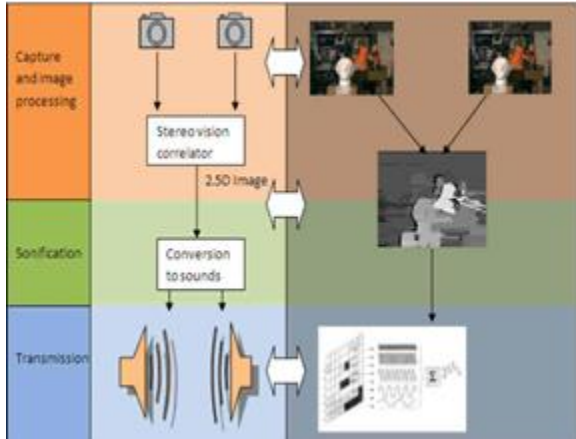
Fig. 1: - Software Analysis Diagram

Operator's duty by watching all the recorded physiological parameters, alarms, video and audio data. A set of custom-built GUI controls is used to present physiological data.

III. EMOTION COMPUTING

The importance of emotions to the computing community is being described by the Rosalind Picard (1997). The ability to detect emotions and the ability to express emotions are two aspects of affective computing. Emotions and emotion detection is an important step to an adaptive computer system.

An adaptive, smart computer system is used to detect a person's emotional state. A study (Dryer & Horowitz, 1997) has shown that people with personalities that are similar or complement each other collaborate well.

It has been shown that people view their computer as having a personality by Dryer (1999). It is important to develop computers which can work well with its user.

Fig. 2: - Blue Eyes Technology

• Theory:
A correlation between a person's emotional state and a person's physiological measurements is being shown on the basis of facial expression work of Paul Ekman. Selected works from Ekman and others on measuring facial behavior describe Ekman's Facial Action Coding System (Ekman and Rosenberg, 1997). Participants attached to devices to record certain measurements including pulse, galvanic skin response (GSR), temperature, somatic movement and blood pressure is one of the Ekman's experiments. The participants were instructed to mimic facial expressions which corresponded to the six basic emotions. Six basic emotions as anger, fear, sadness, disgust, joy and surprise are described him. From this work, Dryer (1993) determined how to distinguish various emotional states using physiological measures GSR, heart rate, skin temperature and general somatic activity (GSA) are some measures which are being used. There are basically two different kind of data analysis. A multidimensional scaling (MDS) procedure is the first analysis which is used to determine the dimensionality of the data.

• Result:
Scores for four physiological assessments [GSA, GSR, pulse, and skin temperature, for each of the six emotions (anger, disgust, fear, happiness, sadness, and surprise)] across the five minute baseline and test sessions are consisted by the data of each subject. At every second GSA data was sampled 80 times and approximately 3-4 times GSR and temperature were reported and 1time pulse was recorded as a beat was detected. The difference between the baseline and test scores were being calculated to account for individual variance in physiology. Scores were treated as missing if they differed by more than one and a half standard deviations from the mean. According to this criterion, twelve score were removed from the analysis. The results show the theory behind the Emotion mouse work is fundamentally sound. A correlation model is used to correlate the physiological measurements. A calibration process is used to derive correlation model. The calibration process having a baseline attribute-to emotion correlation is interpreted based on statistical analysis of calibration signals generated by users having emotions that are measured or known at calibration time.

IV. EMOTION SENSORS

Types of Emotion Sensors for Hand:

a) Emotion Mouse
b) Sentic Mouse

Types of Emotion Sensors for Eyes:

a) Expression Glasses
b) Magic Pointing
c) Eye Tracking

Types of Emotion Sensors for Voice:

a) Artificial Intelligence Speech Recognition
• Emotion Sensors for hand:

a) Emotion Mouse:

Fig. 3: - Emotional Mouse

Active, smart computer system is one goal of human computer interaction (HCI). Gesture recognition, facial recognition, eye tracking, speech recognition, could possibly include in this type of project. Touching is another non-invasive way to obtain information about a person. Computers are used to obtain, store and manipulate data by the people. The computer must start gaining information about the user in order to start creating smart computers. Gaining user information through touch via a computer input device, the mouse is one of the proposed method.

An emotional state may be determined from the physiological data obtained from the user. The emotional state is related to the task the user is currently doing on the computer. In order to gain a sense of the user's personality over a period of time, a user model will be built. The scope of the project is to create a better working environment where the user is more productive by having the computer adapt to the user.

b) Sentic Mouse:

The Sentic Mouse is an experimental inspiration which come from the work of Peter J. Lang, Ward Winton, Lois Putnam, Robert Kraus and Dr. Manfred Clynes .This provide the base for designing a tool for the measurement of the human being's emotional valence response. Any emotional assessment of stimuli, from positive (associated with pleasure, liking and attraction) to negative (associated with displeasure, dislike and avoidance or revolution) can be generalized as Emotional valence. Through this experiment quantitative values can be applied to emotions so that a predictive model for emotional theory can be obtained.

Peter J. Lang and others showed subjects a series of pictures and asked them to self-rate their emotional response. While the subject is being testing through this experiment heart rate and skin conductance are being measured by the Ward Winton, Lois Putnam, and Robert. Conducted a series of sentic experiments was conducted by Dr. Manfred Clynes in which data are being gathered from every vertical and horizontal component of finger pressure.
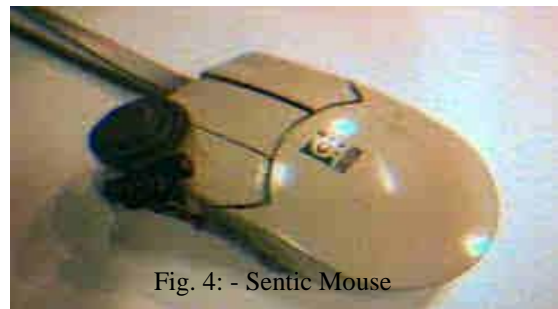

Fig. 4: - Sentic Mouse

The main aim of these experiments are to quantify human emotions and map them into predictive model of emotion theory.

The Affective Computing research group gave approval to these three models to apply interaction between human being and computers. Using a computer, an experiment was conducted to provide the

affective stimulus to the human subject which combined all three emotion studies using a computer.

In Dr. Clynes experiments to collect sentic data an ordinary computer mouse was connected with a pressure sensor. Simultaneously as the subjects viewed Lang's affective picture database, IAPS, we monitored the various other bio sensors were also monitored and connected including GSR and EKG as forgotten by the work done by Winton, Putnam, and Krauss.

The three: sentic data, heart rate, and self-assessment are the three measured results which were compared, against each other as well as against the theoretically predicted results to assess the subject's emotional valence for each slide. The results of the preliminary stages of analysis recommend the capturing of valence information by the sentic mouse.
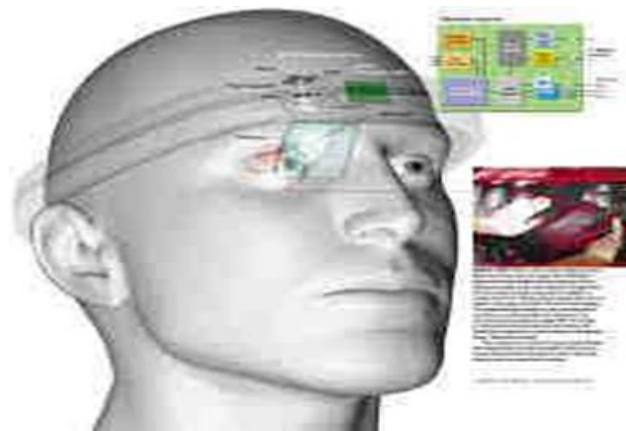
- Eye:

Fig. 5: - Expression Glass

a) Expression Glass:

Expression Glass provide the alternative to the general-purpose machine vision face recognition systems and is application based wearable devices. These expression glasses feel all facial muscle movements, and identify meaningful expressions such as confusion or interest using use pattern recognition pattern recognition. A prototype for these types of glasses has been built and evaluated. The features of compactness, user control, and anonymity are being provided by the use of hidden piezoelectric sensors in a visor extension to a pair of glasses. These glasses give the accuracy of 94% in detecting an expression for untrained users. Give 75% accuracy in recognizing the expression of confusion or interest. With extent in use and with some feedback significant improvement is being achieved. Beyond these numbers appears to be possible with extended use, and.

V. ARTIFICIAL INTELLIGENT SPEECH RECOGNITION

It is in demand to have a kind of environment in which the speech recognition system work. Some factors that may affect the quality of speech include the grammar used by the speaker and accepted by the system, noise level, noise type, position of the microphone, and speed and manner of the user's speech are some factors that recognition .When you call at any telephone number of a big company, you are likely to hear the grandiloquent voice of a cultured lady who responds to your call with generosity saying "Welcome to company X. Please give me the extension number you want". You declare the extension number, your name, and the name of person you want to contact. If the call is being accepted by the called person, the connection is given quickly. An automatic call-handling system is used without employing any telephone operator which is made possible by artificial intelligence.

- The Technology:

Artificial intelligence (AI) basically have two ideas. First one is that, it include the studying of thought processes of human beings. And the second one is that it include the representation of those processes via machines (like computers, robots). AI can be defined as the behavior of a machine which do the same work as done by human intelligence. AI brought smartness to the computers and make computer more useful and less expensive than natural intelligence. Natural language processing (NLP) is one of the artificial intelligence methods to provide communication with a computer in a human language like English. NLP program take the input, read it and initiate the action. Scanning and matching of input words are done against internally stored known words. Recognition of a key word initiate some action. In this way, a person can communicate with the computer in his own

language, no special commands or computer languages are required and thus there is no need to write the programs in a special language for creating software.

VI.   APPLICATIONS

1. One of the main advantages of speech recognition system is that it allows the users to do multiple works simultaneously. So that user can concentrate on observation and manual operations, and still having control on machinery by voice input commands. Military operations have another major application of speech processing. Controlling of weapons by voice is an example. Reliable speech recognition equipment provide pilots to give commands and information to the computers by simply speaking into their microphones—they don't need to use their hands for this purpose.
2. Another good example is a radiologist scanning hundreds of X-rays, ultra sonograms, CT scans and simultaneously dictating conclusions to a speech recognition system connected to word processors. The radiologist can focus his attention on the images rather than writing the text.
3. In airline and hotel reservations voice recognition could be used on computers. A user only required to state his needs, to make reservation, cancel a reservation, or doing enquiries about schedule.
4. Provide prevention from dangerous incidents
5. Brought decrement in ecological consequences financial loss a threat to a human life.
6. Blue Eyes system provides technical means for monitoring and recording human-operator's physiological condition. The key features of the system are:
7. Visual attention monitoring (eye motility analysis)
8. Physiological condition monitoring (pulse rate, blood oxygenation)
9. Operator's position detection (standing, lying)
10. Wireless data acquisition using Bluetooth technology
11. Real-time user-defined alarm triggering
12. Physiological data, operator's voice and overall view of the control room recording

VII.   THE SIMPLE USER INTEREST TRACKER (SUITOR)

If the perceptual and sensory abilities are gained by the computer then computer would become more powerful than living beings on the earth. An intimate relationship between the computer and the humans is needed to be done. And the Simple User Interest Tracker (SUITOR) is a revolutionary approach in this direction. By observing the Webpage at net is browsing, the SUITOR provides the facility of fetching more information at his desktop. By observing where the user's eyes focus on the computer screen, the SUITOR can be more precise in determining his topic of interest.

VIII.   CONCLUSION

The BLUE EYES technology makes the computer so much smart and intelligent that it behave like a human being. It make the life of human being more simpler by providing more luxurious and user friendly services in computing devices.. Till now we have demonstrated the method, the next step is hardware improvement.

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