Blue Eye Technology

M.Sumithra[1a] , B.Buvaneshwari[2b], Suriyapriya.M[3c],Sujitha.P[3d],Rohitha.N.R[3e]

[1]Department of-Information Technology-Panimalar Engineering College ,-Chennai,-Tamilnadu,-India,-600123.

[2]Department of -Information Technology -Panimalar Engineering College,-Chennai,-Tamilnadu,-India,-600123.

[3]Department of-Information Technology-panimalar Engineering College,-Chennai,-Tamilnadu,-India,-600123.

Abstract

Our personal computers today are capable of sensing and controlling human emotion, known as "BLUE EYE TECHNOLOGY". In this method, gadgets are used to sense emotion levels of an individual's body like facial and speech recognition etc. The technology used in Blue Eye Technology can understand our emotions at the mouse, verify our identity, feel our presence and interact with us. In this paper a discussion of the latest techniques known as the Emotion Sensory world of Blue Eye Technology which identify human emotions (disappointed, happy, surprised) through image processing techniques is presented.

Keywords – blue eyes, emotions, images, image processing, senses.

I. INTRODUCTION

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

II. PROPOSED SYSTEM

Looking after the physiological health of working operators 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 performed by the software to show instance reaction to 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 supervisors. By using this software, the working operator's physiological condition can see a preview of selected video sources and related sound streams. Every time the supervisor is notified of incoming alarm messages. The Visualization module can be set in off-line mode, where all data is fetched from the database. Using the selected information, the supervisor reconstructs the course of events. Added extraordinary perceptual abilities to computers would enable computers to work with humans as intimate partners. Researchers are attempting to add more capabilities to computers that will allow them to interact like humans. This will enable them to recognize a person's presences, talk, listen, or even guess their feelings. It aims at creating computational machines with perceptual and sensory abilities like humans. It uses a non-obtrusive sensing method, employing the most modern video cameras and microphones to identify the user's actions through imparted sensory abilities. The machine can understand what a user wants, where he is looking, and even recognize his physical or emotional states.

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

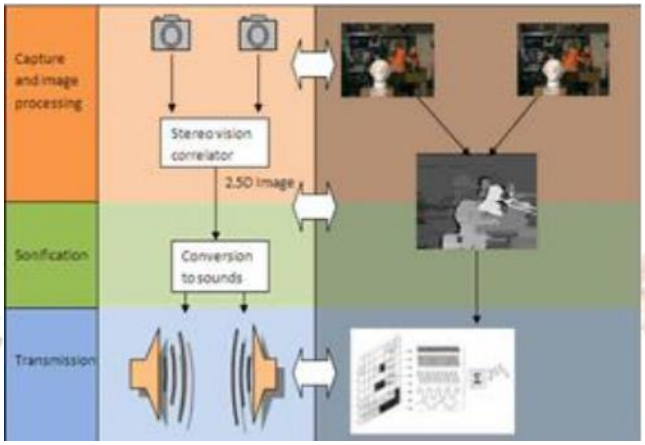


Fig. 1 - Software Analysis Diagram

Operator's duty is to monitor recorded physiological parameters, alarms, video and audio data. Custom-built GUI controls present physiological data.

A. EMOTION COMPUTING

Rosalind Picard (1997) describes the importance of emotions to the computing community. The ability to detect emotions and the ability to express emotions are two aspects of affective computing. Emotions and emotion detection is a crucial step in an adaptive computer system.

An adaptive, smart computer system detects a person's emotional state. A study (Dryer & Horowitz, 1997) shows that people with similar personalities work well together.

It has been shown that people view their computers as having a personality by Dryer (1999). It is a necessity to develop computers that work well with their users.

Fig. 2: Blue Eyes Technology

 Theory:

A correlation between a person's emotional state and physiological measurements is shown by facial expression work of Paul Ekman. Selected works by Ekman and others on measuring facial behavior describe Ekman's Facial Action Coding System (Ekman and Rosenberg, 1997). In Ekman's experiments, participants were attached to devices to record measurements such as pulse, galvanic skin response (GSR), temperature, somatic movement, and blood pressure. The participants were instructed to mimic facial expressions which correspond to the six basic emotions. Six basic emotions such as anger, fear, sadness, disgust, joy and surprise are described here. From this work, Dryer (1993) determined how to distinguish various emotional states through physiological measures. GSR, heart rate, skin temperature and general somatic activity (GSA) are some measures used. In general, two types of data analysis exist. A multidimensional scaling (MDS) procedure is the first analysis 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 determined by each subject's data. At every second GSA data was sampled 80 times and approximately 3-4 times GSR and temperature were reported. One pulse was recorded as a beat was detected. The difference between baseline and test scores was calculated to account for individual physiology variance. 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 scores were removed from the analysis. The results show that the theory behind the emotion mouse work is fundamentally sound. Correspondence models correlate physiological measurements. Calibration is used to derive a 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 measured or known at calibration time.

B. EMOTION SENSORS

Types of Emotion Sensors for the Hand:

A) Emotion Mouse

B) Sentic Mouse

Types of Emotion Sensors for the Eyes:

A) Expression glasses.

B) Magic Points

C) Eye tracking

Types of Emotion Sensors for Voice:

A) Artificial Intelligence and Speech Recognition

 Emotion Sensors for the hand:

a)Emotion Mouse:

Fig. 3: - The Emotional Mouse

An active, smart computer system is one goal of human computer interaction (HCI). Gesture recognition, facial recognition, eye tracking, speech recognition, could be included in this type of project. Touching is another non-invasive way to learn about a person. Using computers, people obtain, store, and manipulate data. The computer must gain information about the user to create smart computers. One of the proposed methods is to gain information from users through touch using a computer input device, such as a mouse.

Emotional states may be determined from physiological data. 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 project aims 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 from the work of Peter J. Lang, Ward Winton, Lois Putnam, Robert Kraus and Dr. Manfred Clynes. This provides the basis for designing a tool for measuring human beings' emotional valence response. Any psychological assessment of stimuli, from positive (associated with pleasure, liking and attraction) to negative (associated with displeasure, dislike and avoidance or revolution) can be generalized to emotional valence.
Through this experiment quantitative values can be applied to emotions so that a predictive model for psychological theory can be obtained.

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

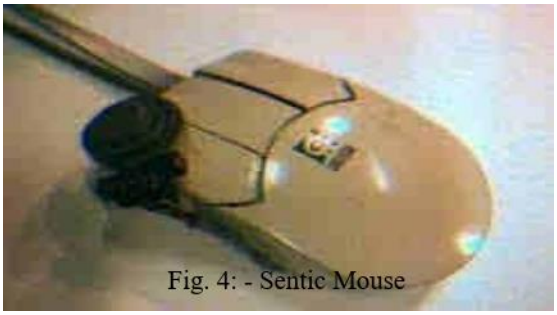


Fig.4: - Sentic Mouse

These experiments aim to quantify human emotions and map them into a predictive model of emotion theory.

The Affective Computing research group approved these three models to apply interaction between human beings and computers. Using a computer, an experiment was conducted to provide an affective stimulus to the human subject. This experiment combined all three emotion studies using a computer.

In Dr. Clynes' experiments to collect sensory 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. These sensors included GSR and EKG as forgotten by Winton, Putnam, and Krauss.

The subject's 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 analysis suggest that the sentic mouse should be used to capture valence information.

 Eye:

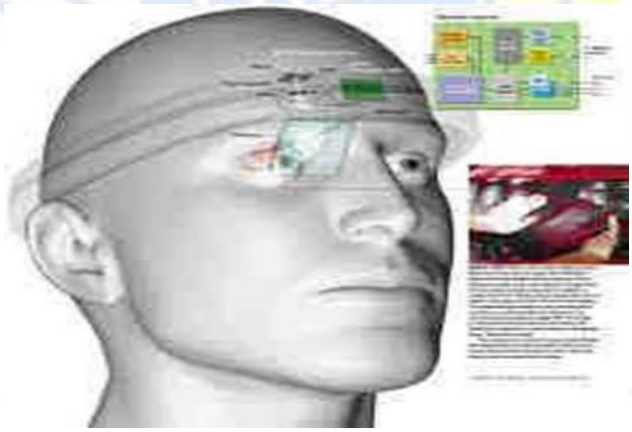


Fig. 5: Expression Glass

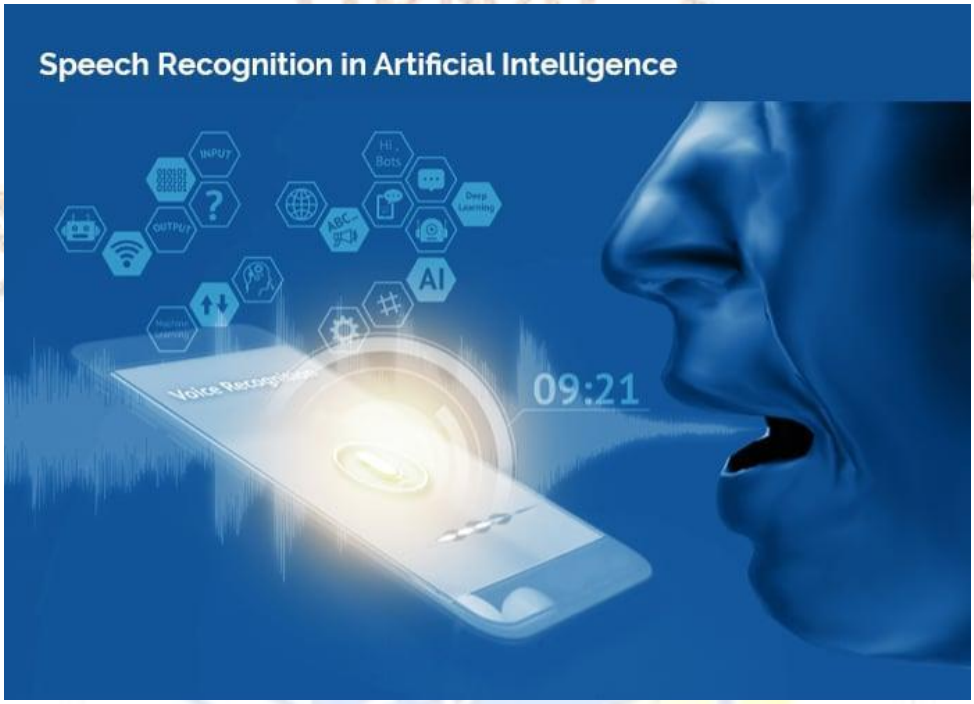
A) Expression Glass:

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

C. ARTIFICIAL INTELLIGENT SPEECH RECOGNITION

It is needed to have a kind of environment in which speech recognition systems 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 the person you want to contact. If the caller accepts the call, the connection is established quickly. Artificial intelligence makes automatic call-handling possible.



 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 that does 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 is done against internally stored known words. Recognition of a key word initiate some action. In this way, a person can communicate with a 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.

III. APPLICATIONS

1. One of the main advantages of speech recognition systems is that it allows users to do multiple works simultaneously. So that the 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 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 is only required to state his needs, to make a reservation, cancel a reservation, or doing enquiries about schedules.

4. Provide prevention of dangerous incidents

5. Brings 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 triggers.

12. Physiological data, operator's voice and overall view of the control room recording

IV. 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 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 from 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.

V. LITERATURE SURVEY

Many approaches to blue eye technology and human emotion recognition have been proposed in the last two decades. Mizna Rehman Mizna et.al.[1] This paper presents a technique which identifies human emotions (happy, surprised, sad, or excited) through image processing by taking out only the eye portion from the captured image which is further compared with images that are already stored in the database. This paper intends two results of the emotional sensory world. First, observation reveals the fact that different eye colors and their intensity result in change in emotions. It changes without giving any information on the shape and actual detected emotion. It is used to successfully recognize four different emotions in the eyes. S. R. Vinotha et. Al. [2], this paper uses feature extraction technique to extract the eyes, a support vector machine (SVM) classifier and a HMM to build a human emotion recognition system. The projected system presents a human emotion recognition system that analyses the human eye region from video sequences. From the frames of the video stream the human eyes can be extracted using the well-known canny edge operator and classified using a non-linear Support Vector Machine (SVM) classifier. Finally, a standard learning tool is used, Hidden Markov Model (HMM) for recognizing the emotions from the human eye expressions.

VI. CONCLUSION

Social relationships are maintained and developed by understanding and recognizing emotional expressions, according to recent research documents. This paper gives an approach to creating computational machines that have perceptual and sensory abilities like those of human beings which enable the computer to gather information about you through special techniques like facial expression recognition and considering biological factors like heart rhythm and blood heat. The BLUE EYES technology makes the computer more intelligent and intelligent that it behaves like a human being. It makes the life of humans more convenient by providing more luxurious and user friendly services in computing devices.

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