BLUE EYES: AN INTELLIGENT SENSING SYSTEM

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Abstract: - Today's world is of artificial intelligence which shows how far a human mind can think and work. Giving machines a human power- To sense and react is possible by the use of a technology named- Blue Eyes. This paper implements a new technique called as Human-Machine interaction at emotional level of Blue Eyes Technology which recognizes human using image processing techniques by extricating an eye portion from the captured image which is then differentiated with the images stored in data base. This information is then analyzed to determine the user's physical, emotional, or informational state, which in turn can be used to make the user more productive by performing expected actions or by providing expected information. Depending on the identified mood or emotion, machine can interact with human through various songs to make human emotional level normal. The Blue Eyes Technology developed is intended to be a complex solution for monitoring and recording the operator's conscious brain involvement as well as his/her physiological condition. This shows yet another development in the field of Brain Computer Interface.

Keywords- Blue Eyes, Bluetooth, sense, emotions, image processing, artificial intelligence.

I. INTRODUCTION

Blue eyes technology aims at creating a computer that have the abilities to understand the perceptual powers of human being by recognizing their facial expressions and react accordingly to .them. The main objective of Blue eyes technology is to develop a computational machine having sensory and perceptual ability like those of humans. It consists of a hardware and software systems set embedded together.

Blue in terms stands for Bluetooth, which enables reliable wireless communication Eyes, because we get most of the sensory information through eye movement. Computer recognizes humans emotional levels by a simple touch on the mouse and it can interact with us as an intimate partner. The machine feels your presence; verifies your identity and starts interacting with you and even it will dial and call to your home at any urgent situations.

II. BASIC STRUCTURE OF BLUE EYES TECHNOLOGY

The objective of Blue Eyes technology is making an interaction between a human and a machine possible. Blue Eyes technology uses most modern cameras, microphones and advanced non-obtrusive sensing techniques to interact with humans and understand the emotions of human beings. The machine has the ability to grasp the eye movement of the user, the needs of the user and also can understand the emotional and physical states of a user in front of the machine. The process of making a computer having sensing and emotional capabilities is known as "Affective Computing".

The steps involved for designing such type of computers are:

1. Process of giving sensing capacity: Blue Eyes utilizes many sensor mechanisms, which is equivalent for the ears, eyes and other sensory organs that human beings used to express emotions and recognize each other.

2. Human Emotion detection or Affect Detection. : The machines are given the ability to identify the minor variations in the moods of human beings.

3. Respond appropriately and properly: This is done by comparing the data stored in the database with the obtained results through Central Acquisition unit (CAU).

III. NEED FOR BLUE EYES TECHNOLOGY

- Human error is still one of the most frequent causes of catastrophes (calamity) and ecological disasters because the human contribution to the overall performance of the system is left unsupervised.

- The control instruments within the machine have automated it to large extent, thus Human operator becomes a passive observer of the supervised system, resulting in weariness and vigilance drop, but the user needs to be active.

- The user may not notice important changes of indications causing financial or ecological consequences, which is a threat to human life. Thus, it is crucial that operators brain is involved in an active system supervising over the whole work time period.

IV. TECHNIQUES USED IN BLUE EYES TECHNOLOGY

i] Simple User Interest Tracker (SUITOR): The Simple User Interest Tracker is revolutionary approaches towards the design of machine having the ability to maintain an intimate relationship between the humans and the computers. The SUITOR becomes active when the user makes an eye contact with the personal computer screen. The SUITOR has the ability to determining the topic of interest of the user and also according to this it can able to deliver the appropriate data to a handheld device
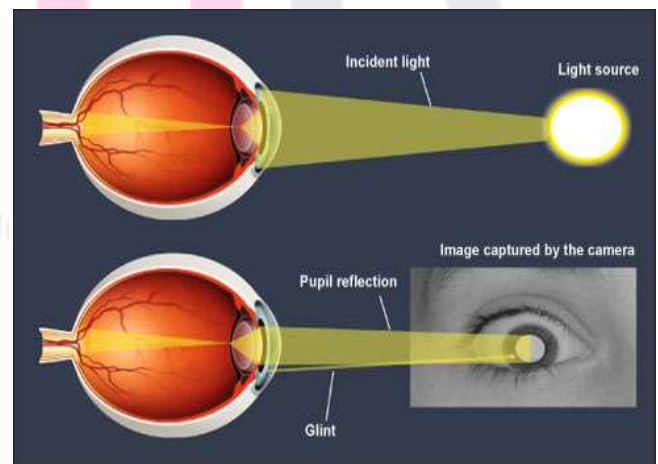

Fig 1: Simple User Interest Tracker

ii] Emotional Mouse: In Blue Eyes, the machines have the ability to identify the minor variations in the moods of human beings. Say a person may strike the keyboard hastily or softly depends on his mood

like happy or in angry. this Emotion Mouse is an input device to track the emotions of a user by a simple touch on it. It enables the machines to obtain physiological data and emotional state such as heart beat, pressure, temperature etc by a single touch on the mouse or key board where different sensors like heart beat, temperature, pressure. The Emotional Mouse is designed to evaluate and identify the user's emotions such as fear, surprise, anger etc.

Fig 2: Emotional Mouse

iii] Manual And Gage Input Cascading (Magic Pointing): The Eye gaze tracking methods extracts important data related to sense emotions. The gaze tracking has been proved as an excellent pointing method for giving input to computers. Due to the existing drawbacks with this traditional methods, an alternative approach – termed as MAGIC - Manual and Gaze Input Cascaded – is used to overcome these difficulties. Use of a webcam is made to rapidly determine motion of pupils of the user under different lightning conditions.

The main aim of MAGIC pointing is to use 'gaze' to warp the position of the curser to the target location, reasonably where the user was looking at, so as to reduce the cursor motion amplitude required for target selection. When the cursor position is identified, only a small movement is needed by the user to click on the target by a manual input device that is to accomplish Manual Acquisition with Gaze Initiated Cursor or Manual and Gaze Input Cascaded (MAGIC) pointing. Conservative and liberal are two main magic pointing methods–in terms of cursor placement and target identification, were outlined, analyzed and executed with an eye tracker unit.

Fig. 3: Magic pointing technique

iii] Expression Glass: Expression Glass is an available replacement for the usually used machine vision face or eye recognition methods. The glass senses and identifies the expressions such as interest or confusion of the user by analyzing pattern recognition methods and facial muscle variations. The glass uses piezoelectric sensors as a prototype.
iv] Artificial Intelligent Speech Recognition: User's speech, position of the microphone , noise level, noise type and grammar are some important factors that may influence the features of speech recognition system. The user speaks to the computer through microphone and that speech get filtered and stored in RAM. The input words are scanned and matched against the internally stored words. Pattern matching is designed to look for the best fit because of variations in loudness, pitch, frequency difference, time gap etc.

V. BLUE EYES TECHNOLOGY ARCHITECTURE

Blue eyes technology mainly consists of the following components:

- Data Acquisition Unit (DAU)
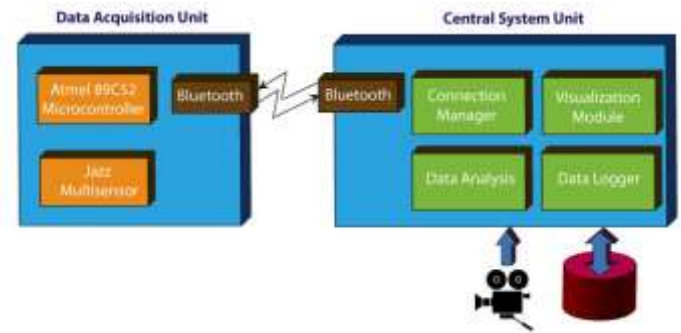- Central System Unit (CSU)
- The Hardware
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Fig. 4: Overview of blue eyes system

Data Acquisition Unit (DAU) of Blue Eyes technology: The main function of DAU is to gather the physiological information from sensors and forward to the CSU for processing and verification purposes. The mobile device (DAU) is integrated with the blue tooth module , provides a wireless interface between the Central System Unit (CSU) and the user or operator having the sensors. PIN codes and ID cards are assigned to the entire operator's for authentication purposes. The device uses a five-key keyboard, beeper and LCD display for the interaction with the operators and if, any unwanted situation occurs, the machine uses these devices to inform the operators. The 'voice' information from the user is transferred with the help of a headset, which is interfaced with the Data Acquisition Unit using a mini jack plug. DAU incorporates various hardware modules like system-core Bluetooth section, Atmel 89C52 microcontroller, EEPROM, Beeper, LCD display (HD44780), LED indicator, voltage level monitors and 6 AA batteries.
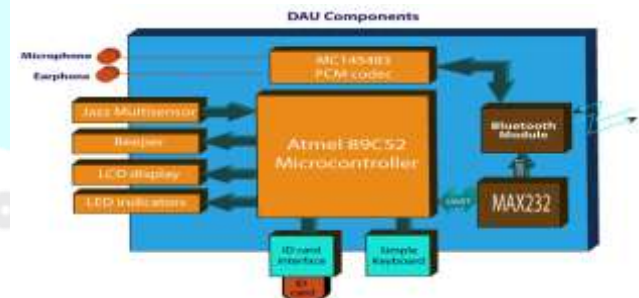

Fig 5: Data Acquisition Unit (DAU) Components

Central system Unit (CSU) of Blue Eyes technology: CSU is the next squint of wireless-network connection in the Blue Eyes technology. The CSU mainly contains codec (PCM Codec commonly used for voice information transmission) and a wireless blue tooth module. This CSU section is integrated to a personal computer using USB, parallel and serial cable. The mini-jack socket is used for audio data accessing. The program containing the operators personal ID is amalgamating to the personal computer through the serial and power ports. The microcontroller (Atmel- 89C2051) inside the unit handles the I2C EEPROM- programming and UART transmission.
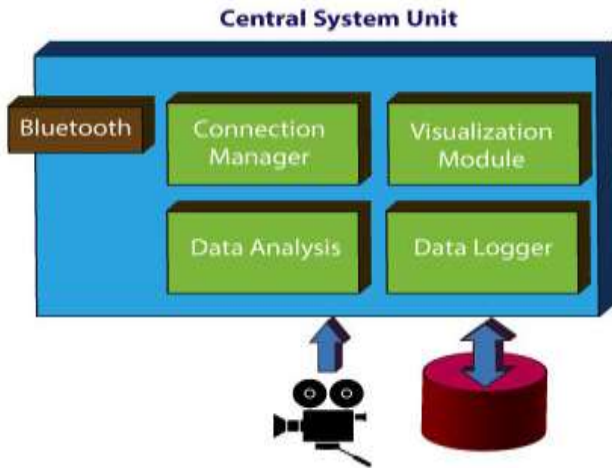
supporting more elegant and user friendly provision in computing devices. Machine interacting, sensing and responding to human emotions is possible using the blue eyes technology. The blue eyes technology meant to be a stress reliever, driven by the advanced technology of studying the facial expressions for judgment of the intensity of stress handled. These new possibilities can cover areas such as industry, transportation, military command centers or operation theaters. The day is very near, that this Blue Eyes technology will advance its way towards our house hold devices and even smart phones which will be the beginning of a new era in artificial intelligence.

VIII. References:

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Fig 6: Central System Unit Components

VI. THE SOFTWARE USED IN BLUE EYES TECHNOLOGY:

The continuous supervision of the operator's physiological condition is done by this Blue Eyes technology software. The software will respond in real time according to the operator's physiological condition. This software helps in transferring of the data or information from managers to the data analyzers. Then the processed information is transferred from this data analyzers unit to the GUI controls and data analyzers. The user supervisor interface section is supported by this data visualization module . The visualization module works in the off-line mode and it will continually fetches and stores the information from database and also records the video, audio and physiological parameters. Thus the physiological condition of the operators can be detected using the 'Blue Eyes' software.
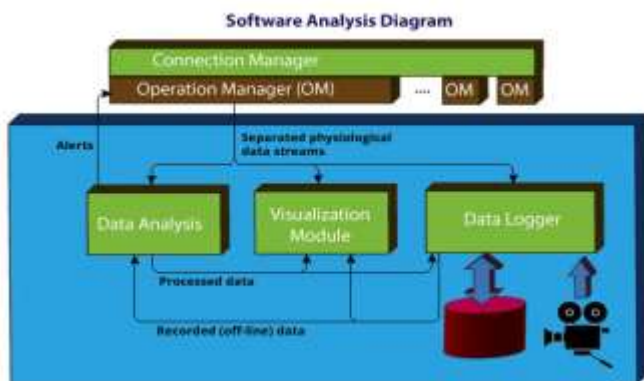

Fig 7: Software Analysis Diagram

VII. Conclusion:

Blue Eyes technological approach assure a convenient technique where a machine interacting with a human simplifies the life by