

A Review on “Blue-Eyes Technology”

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Abstract—Human beings interact with each other to share their ideas, thoughts and knowledge. But is it possible to communicate with a computer which can communicate with us as we communicate with each other? Imagine that, in a morning you walk on to your computer room and switch on your computer, and then it tells you "Hey friend, good morning you seem to be in a bad mood today!!". And then it opens any applications which will tries to cheer you. This is possible by a technology known as “BLUE EYES” technology. Blue eyes technology makes a computer to interpret and sense human feelings and behavior and also enables the computer to react according to the sensed emotional levels. Blue eyes technology aims at creating a computer that have the proficiency to understand the emotions of human being by identifying their facial expressions and behave accordingly to them

Keywords— DAU (Data Acquisition Unit), CSU (Central System Unit), MAGIC (Manual and Gaze Input Cascaded), Emotion Mouse, Simple User Interest Tracker (SUITOR)

I INTRODUCTION

In “Blue-Eye” technology, “Blue” is for Bluetooth, which is known for wireless communication and the term ‘Eyes is used for the eye movement used to identify the information. The main goal of Blue eyes technology is to develop a computational machine having sensory and perceptual ability like those of humans. Blue eyes technology makes a computer to interpret and sense human feelings and behavior and also enables the computer to react according to the sensed emotional levels. The aim of the blue eyes technology is to give human power or abilities to a computer, so that the machine can naturally communicate with human beings as we interact with each other. Blue Eyes technology basically uses different types of sensors to indicate physical as well as psychological actions and to extract key information. Then, it is used to calculate the psychological, emotional, physical or any informational state of user. All human beings have some perceptual capabilities, the ability to understand each other’s emotional level or feelings from their facial expressions. Blue eyes technology aims at creating a computer that have the abilities to interpret the perceptual powers of human being by identifying their facial expressions and react accordingly to them.

II SYSTEM OVERVIEW

The Blue Eyes system has hardware with software carrying on it.

The hardware consists of DAU(Data Acquisition unit) and CSU(central system unit)

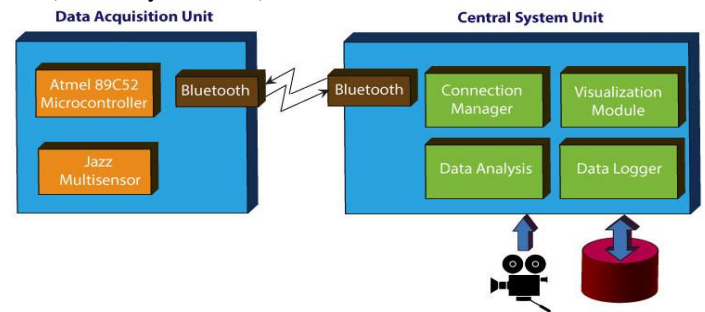


Fig 1: Over view of Blue Eyes systems

A Data Acquisition Unit(DAU)

The DAU is the mobile component of the system used in the Blue Eyes technology. The main use of DAU is to collect the physiological information from sensors and forward it to the CSU for processing and also verification purposes.

The Bluetooth module provides a wireless interface between the operator consisting of the sensors and Central System Unit (CSU). PIN and ID are assigned to the operator for the authentication purposes. The device uses a LCD, beeper and keyboard for the communication between the devices. The information from the user is transmitted using a mini jack plug

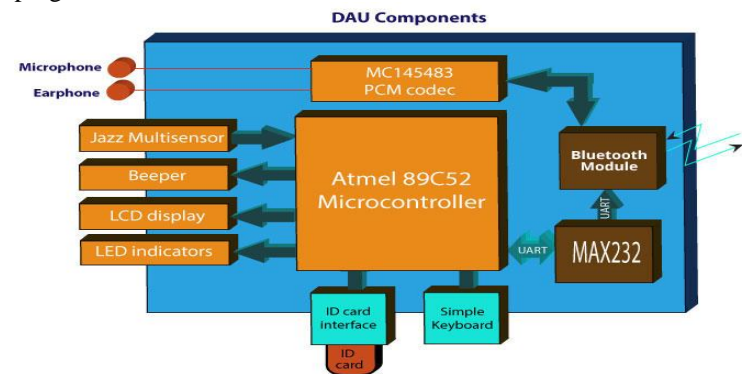


Fig.2 Data Acquisition Unit (DAU) Components

B. Central system Unit (CSU)

The CSU consists of a wireless Bluetooth device and voice information transmission. This CSU is connected to a computer using USB wire, serial and parallel cable wire. The socket, mini jack is used for accessing the audio data. The program that contains the operators personal ID is communicating to the personal computer through the power and serial ports.

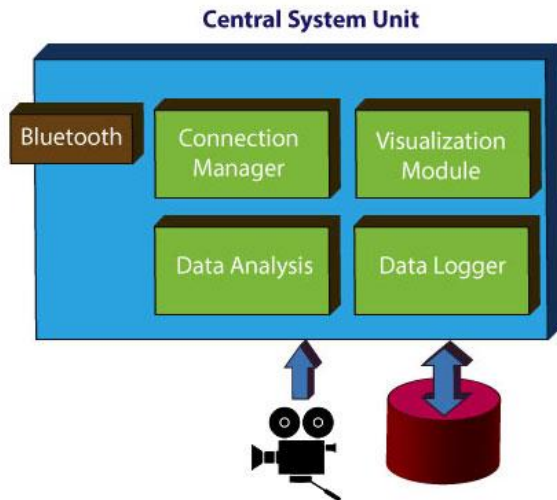


Fig.3 Central System Unit(CSU) Components

The Software used in Blue Eyes Technology:

The operator's physiological condition is continually noticed by this Blue Eyes technology software. The software will reciprocate in real time according to the operator's physiological condition. This software helps to transfer the data from managers to the data analyzers. Then it transfers the processed data from this data analyzers unit to the GUI controls and data analyzers. At last, the data visualization module guide a user supervisor interface section. The visualization module is in the off-line mode and it will continually fetch the data from database and also records the audio, video and physiological parameters. Thus 'Blue Eyes' software enables the administrator to know about the physiological condition of the operators

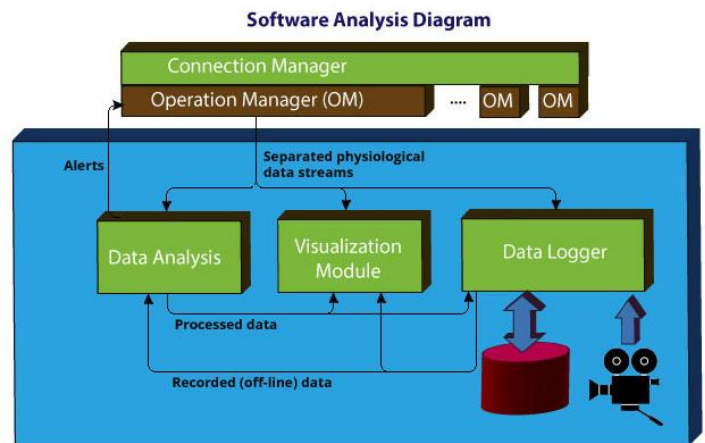


Fig.4 Software Analysis Diagram

III OBJECTIVE OF BLUE EYES TECHNOLOGY

The objective of Blue Eyes technology is to design a computational machine having perceptual and sensory abilities like human beings. Blue Eyes technology uses microphones, most modern cameras and advanced non-obtrusive sensing techniques to communicate with humans and recognize the emotions of human beings. The machine has the ability to embrace 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.

IV PROCESS OF AFFECTIVE COMPUTING

The process of making a computer having emotional and sensing capabilities is known as "Affective Computing"

The steps for designing such type of computers are given below.

1. Process of giving sensing capacity
2. Affect Detection or Human Emotion detection
3. Respond appropriately and properly

1. Process of giving sensing capacity:

Blue Eyes make effective use of 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. Blue Eyes uses cameras, voice recognition software and biometric sensors to understand and respond to the emotional levels of humans. The voice recognition software can understand not only what is being spoken but also the tone how it is said. High resolution cameras are used for tracking the minute facial expressions, eye movements and hand gestures. Biometric sensors are used for measuring and analysing the body temperature, muscle tension, blood pressure and other physiological gesture correlated with emotions.

2. Detecting human emotions/ Affect Detection:

In Blue Eyes technology, the machines have the ability to indicate the minor variations in the moods of human beings. Say a person may hit the keyboard hastily or softly depends on

his mood like happy or in angry. The Blue Eyes enables the machines to identify these minor emotional variations of human beings even by a single touch on the keyboard or mouse and the machines started to behave with the users according to this emotional levels. This is done with the instruction of intelligent devices like "Emotion Mouse". Along with this , Simple User Interest Tracker (SUITOR), Emotion Mouse and Artificial Intelligent Speech Recognition are assembled with the Blue Eyes technology to recognize the speech and classify the attention of the peoples at that instance of time.

For implementing the Affective Computing we need Emotion Sensors.

Types of Emotion Sensors used in Blue Eyes Technology:

1. Emotion Mouse:-

Emotion Mouse is an input device used to track the emotions of a user by a simple touch on it. The Emotion Mouse is designed to identify and evaluate the user's emotions such as surprise, fear, anger, sadness, disgust, happiness etc. when he/she is interacting with computer. The main objective of the Emotion Mouse is to gather the user's physiological and physical information by a simple touch. In Blue Eyes technologies, we need to build a system that have the ability to identify speech recognition, eye tracking, facial recognition, gesture recognition all these perceptual abilities of human beings. In Blue Eyes, the machines have the proficiency to analyze the minor variations in the moods of human beings.

2. For Eye - Expression Glass:

Expression Glass is an substitute for the usually available machine vision face or eye recognition methods. By evaluating pattern recognition methods and facial muscle variations, the glass senses and establishes the expressions such as interest or confusion of the user. The model used for this glass uses piezoelectric sensors¹¹



Fig.5 Expression Glass

3. MAGIC - Manual and Gaze Input Cascaded

The Eye gaze tracking methods is a new way technique for handling the 'eye gaze' for man machine interface. The gaze tracking has been an excellent pointing method for providing a better input to computers. But there are also some drawbacks exist with eye tracking methods. To overcome these barriers an alternative approach termed as MAGIC - Manual and Gaze Input Cascaded is taken into consideration. The selection and pointing of the cursor is basically controlled by manual means but also followed by a gaze tracking mechanism and is usually known as MAGIC Pointing. The use of MAGIC pointing is to warp the previous home position of the cursor to the location of the target through the 'eye gaze', in order to reduce the motion of the cursor which is required for target selection.

4. Simple User Interest Tracker (SUITOR)

The Simple User Interest Tracker is an approach towards the design of machine which has the ability to maintain relationship between the humans and the computers. The SUITOR continuously analyze the users actions and behavior, that where his eye focus on the personal computer screen. The SUITOR has the power to decide what is the topic of user is and also can be able to send the data to the particular device. SUITOR fills a scrolling ticker which is displayed on a personal computer screen with information related to the user's current task.

5. Artificial Intelligent Speech Recognition

For implementing the Artificial Intelligent Speech Recognition system in Blue Eyes technology, the working environment should be of great significance. The manner of the user's speech, grammar, noise type, noise level and the position of the microphone are some important factors that may impact the features of speech recognition system. In Artificial Intelligent Speech Recognition system, an automatic call handling technique is implemented without any telephone operator.

Two basic ideas are included in the Artificial intelligence (AI),

- Study the thought of human beings.
- Represents the thought process of human beings through robots, computers etc.

Actually Artificial intelligence (AI) denotes the behavior of a computer or any machines but it is carried out by the humans is called as 'intelligent'. This AI makes machines more power full, useful, and smarter and also it is less expensive compared to natural intelligence. Natural language processing (NLP) makes artificial intelligence systems to communicate English. The main goal of the Natural language processing (NLP) is to

understand the users input and react according to these inputs. The input data or words are continuously scanned and finds matches against inside stored known data or words. And after identifying the key words, the corresponding actions are carried out by the machine. In this way the Blue Eyes technology enables the users to communicate with the machines with their own languages

V.APPLICATIONS

1. Security systems - The security can be controlled by using blue eye technology. the concerns of getting a wrong person in security systems should be avoided and if his intentions are not harmful then he must be allowed to enter the security system.
2. Control systems - Human control is required in various control system, however human may get tired, so to avoid this situation, blue eye technology can be used ,where cameras kept for surveillance can be used to detect the person's emotional condition rather than just recording. Blueeye technology can be used in various control systems like banks, aeroplanes, trains, etc.
3. Assisting human operators - This technology helps to monitor physical conditions of operators in various industries, where many toxic substances are generated, so if any harm is caused these operators can automatically generate a signal so that an alarm can be triggered. Therefore preventing any catastrophe.
4. Driving systems - It can be helpful to all the people who are driving. When a sensor is attached to steering-wheel, it can assess the emotional stability of driver and can guide him in traffic conditions to stop and take a break or continue driving.
5. Access to data - Rather than physically searching all data, it can be easily accessed using one single command for eg. if a user has to make an urgent call to some other location which is known to both sides then the person can make call instantly.
6. Bluetooth - data can be acquired using bluetooth, this data can be available to anyone in wireless mode.

VI CONCLUSION

BLUE EYES technological approach assure a convenient technique, that simplifies the life by supporting more elegant and user friendly provision in computing devices. The day is very near, that this Blue Eyes technology will advance its way towards your house hold devices and makes you lazier. In future, even this Blue Eyes will reach as your hand held mobile device.....

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