

THE BLUE EYES TECHNOLOGY- AN ARTIFICIAL INTELLIGENCE

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ABSTRACT

Have you ever think about a computer with which we can interact in the same manner we interact with each other? Suppose after a busy day from office you walk to your computer and after switching it on it tells, "hello my friend, it seems that you are not in a good mood today". After this it opens some playlist and plays some songs to cheer you. It seems to be impossible but in our future it will become possible by "Blue Eyes Technology". The main aim behind this is to allow some human power. We human understand each other's mood by their facial expression. By adding these type of perceptual abilities of human to computers, it will able to communicate with humans. The "Blue Eyes Technology" aims at providing machines that have sensing abilities like those of human beings.

KEY WORDS: Blue Eyes, Emotion Mouse, Expression Glass, Emotion Recognition, Eye Expressions, Magic Pointing, Bluetooth, Speech Recognition, Simple User Interest Tracker (SUITOR).

1. INTRODUCTION

In today's modern era, we use computer for many purpose like education and entertainment. We always see computer as our best guide whenever we want to learn about anything. We can imagine a life where this computer can provide all the helps as a best friend like to give suggestions on something, motivation etc. By adding these qualities computers can predict our emotional state also. "Blue Eyes Technology" will be a helping and for this. In this term "Blue" stands for Bluetooth showing wireless communication and "Eyes" is used to express information. By using a technology based on sensing it firstly identify user's identity obtains information by observing their action. It then interacts with user by some special ways like facial and speech recognition etc. It is also able to understand emotions by the way you touch the mouse.

2. SYSTEM OVERVIEW

In Blue eyes technology systems, the movement of eyes helps in finding the status of user's visual concentration. The system also checks the heart beat and supply of oxygen to the blood if it is normal and set off some actions. Blue Eyes system includes a mobile measuring device merged with Bluetooth component which is used for wireless interface and a central analytical system. ID cards allotted to every user outline on the central unit side gives important details so the system comprises of Mobile measuring device (DAU) and Central System Unit (CSU). The Fig. 1 describes the system overview.

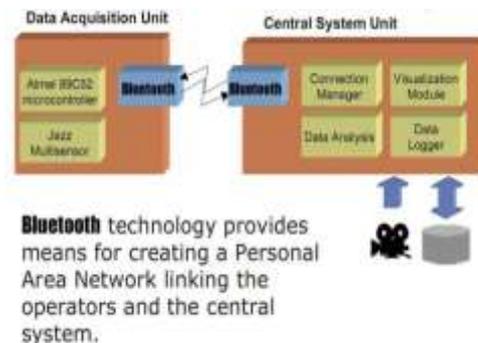


Fig 1- System Overview

DESIGN

The complete system design is shown as follows :

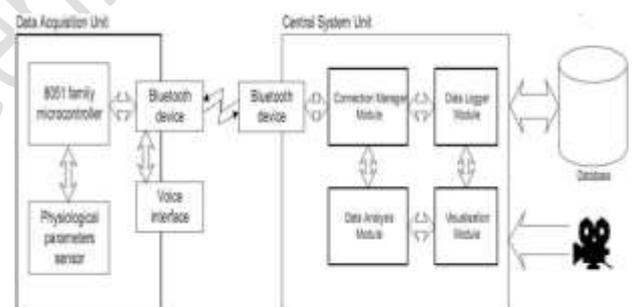


Fig 2- Block Diagram of System Design

2.1 The Hardware

2.1.1 Data Acquisition Unit

It is a portable part of the system. It receives the physiological information using the sensor and transfer it to the central system. To fulfill the task, all the wireless Bluetooth connection (like establishment of the connection, its authentication and termination) should be accomplished by the device. The Id cards and pin numbers can provide authorization. Operator communication is done with a simple keyboard, a LCD display and some signal. When any unfavorable case is found then the device notify the user. Voice related data can moved by a headset linked to the DAU by jack plugs.

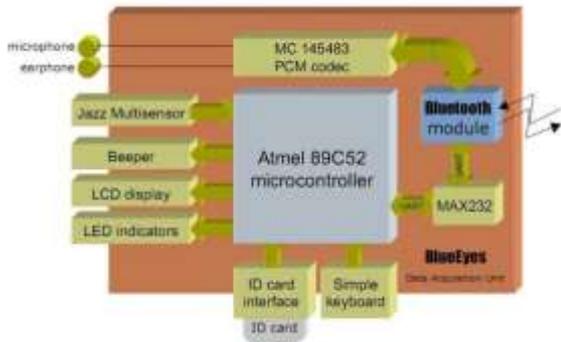


Fig 3- Data Acquisition Unit

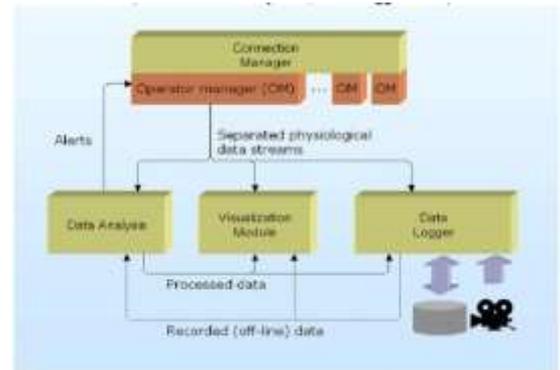


Fig 4- Software Analysis Diagram

2.1.2 Central System Unit

It is the second co-worker of wireless connection. This box includes a module for Bluetooth and a PCM codec used for transmitting voice data which are linked to PC using parallel, serial and USB cables.

2.2 The Software

In Blue Eyes, the main task of software is to supervise physiological state of the working user. It consists of many functional modules like system core which aids to the flow of transfer between other modules. Each consumer can report for multiple producer and so able to get different types of data.

2.2.1 Connection Manager manages the wireless communication between the DAU and the central system. It handles new device search in range covered, Bluetooth connection establishment, authentication, buffering, alerts etc.

2.2.2 Data Analysis module analyzes the original sensor data to gain information about user's physiological state. The module consists of a number of smaller analyzers extracting different types of information. The most important analyzers which are used for extracting various information are Saccade detector (for eye movements), Pulse rate analyzer (for pulse rate) and custom analyzer (other behaviors).

2.2.3 Visualization module enables supervisor to observe each operating user's physiological state with a walk-through the chosen video source and the sound related to it. Alarm messages immediately indicated to the supervisor. This module can be offline also in which data is received from the database. The physiological data is shown by a pie chart and VU meter.

3. Emotional Sensors

3.1 For Hand- Emotion Mouse for Hand

A human-computer interaction system includes various recognition related to eyes, face, speech etc. A person's touch is also used to obtain information. For creating smart computers, it must be able to get information about the user via mouse also. An emotional state of a user is predicted by the collected physiological data which is further related to the work the user is performing.

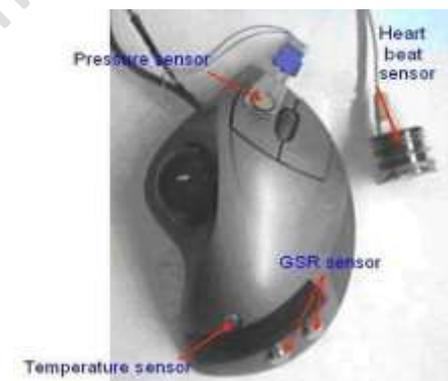


Fig 5- Emotion Mouse

3.2 Expression Glasses for Eyes

It is a wearable device with the help of which any viewer can view wearer's facial expressions. It identifies expressions using pattern recognition of facial gestures. The prototype of glass use piezoelectric sensors which are hidden in a vision extension in a pair of expression glasses. It provides conciseness & user control.



Fig 6- Expression Glasses

3.3 Manual and Gaze Input Cascaded (Magic) Pointing

In this method, eye gaze is used for a very high quality selection & handling process. Most of the cursor motion is erased by twisting the cursor on portion of eye gaze surrounding the goal. The selection & pointing process of cursor is maintained manually but also lead by a gaze tracking system called MAGIC pointing. Its main aim is the use of gaze to bend earlier position of cursor to position of target to lower amplitude of cursor motion needed for goal selection. When the position of cursor is detected, only a small motion is required by the user on target's click. There are two MAGIC pointing techniques- conservative and liberal based on placement of cursor and identification of target were defined, examined and executed by an eye tracking component.

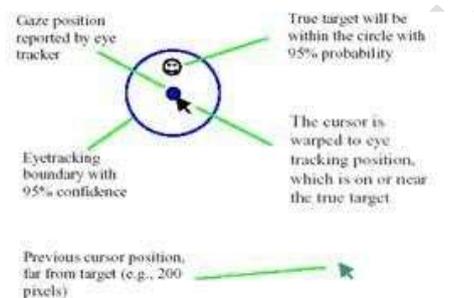


Fig 7- The Liberal MAGIC pointing technique cursor is placed in the vicinity of a target that the user fixates on

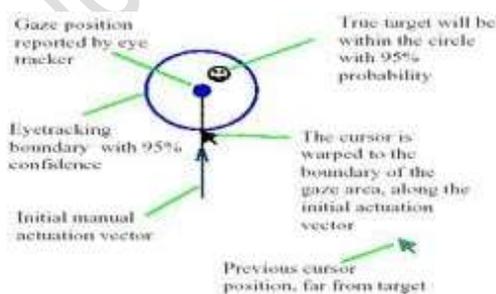


Fig 8- The Conservative MAGIC pointing technique with intelligent offset

Advantages:

- less physical effort as compared to earlier manual pointing methods.
- Greater ease
- More accuracy.
- Rapid speed of functioning

Drawbacks

In MAGIC pointing various methods like blinking of eye and gazing etc. are needed for the selection of target. Sometimes it doesn't work properly. If a user is not looking continuously over a particular thing then the target will not be selected. Therefore many chances of wrong selections.

3.4 Artificial Intelligent Speech Recognition- for voice:

Certain causes may influence the status of speech recognition including the grammar, noise type, level of noise, arrangement of microphone, speed and way of user's talk. Whenever we call to the customer care of a standard company, we expect a calm voice saying, "welcome to our company. Please provide us with the extension number needed." After that we give the extension number, our name and person's name we want to contact with. If the call is received by the person we called then the connection is made rapidly. By using Artificial Intelligence (AI), an automatic system for call handling is used without engaging telephone operator. AI has two designs- firstly the study of thinking of human beings. And second the representation of these procedures by machines like robots or computers. AI is the practice of a machine in which the work done is same as that done by human intelligence. Natural language processing (NLP) is an AI method in which communication is made with the computer using human languages like English. In NLP the input is taken, after reading it the action is taken. Input words are scanned and matched with internally stored words which are known. Action is taken only after recognition. By this way, a communication between computer and person is done without complex commands or programming languages.

3.5 The Simple User Interest Tracker (Suitor)

It is an approach for the designing a machine which is capable of maintaining a close connection between computer and humans. The SUITOR constantly examine about the user that where he is focusing on computer screen. It can identify the interest of user and relating to this can provide suitable data to handheld device.

4. APPLICATIONS

1. Speech recognition system helps the user to perform multiple jobs simultaneously. User can focus on So that user can concentrate on manual operations and also control on machine using input voice commands. Military operations, Controlling of weapons, commands

- given by pilots to computer without using hands are the examples of voice recognition.
2. Another example is that a radiologist can concentrate on images than writing the text.
 3. Blue Eyes system monitors and records human-operator's physiological condition.
 4. Video games
 5. Automobile industries

5. CONCLUSION

A computer can be made very intelligent and smart like human being using the BLUE EYES TECHNOLOGY. It make humans' life more simple by delivering more user- friendly and delicate services in computing devices. Soon in future this technology will take its place in our daily life making us lazier.

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