A Study on Blue Eyes Technology

Hardik Anil Patil, Shripad Amol Laddha, Nachiket Milind Patwardhan

3rd Year Engineering Student, Dept. of Computer Engineering, VESIT, Mumbai University, India

3rd Year Engineering Student, Dept. of Computer Engineering, VESIT, Mumbai University. India

3rd Year Engineering Student, Dept. of Computer Engineering, VESIT, Mumbai University. India

ABSTRACT: This paper presents a technology which aims to create a computer that has perceptual and sensory abilities. The term BLUEEYES refers BLUE: Bluetooth that enables efficient and authentic wireless communication, and EYE:eye movements acts as a major source of involuntary information. Blue eyes technology provides ways to monitor and record any user's physiological state. It can act as a means of verifying your identity, feel your presence and interact with you, just as your friend does.

KEYWORDS: Blueeyes; DAU; CSU; ATMEL 8952 microcontroller; Magic pointing.

I. INTRODUCTION

In today's world, computers have become our greatest friends with all the features to entertain and educate us, but we never noticed that this friend of ours doesn't care for us. So imagine a world where your computer tells you to calm down when you are angry, motivate you when you are frustrated and provide all the help and pleasure that an actual best friend would do to you. If these qualities are collaborated with a computer it will not only identify our physical state but also predict emotional status and act accordingly. All this has now become possible because of an advancement in technology known as the Blue Eye Technology, Blue Eye is defined as the technology that provides means for monitoring and recording a person's basic physiological parameters, basically through this technology, a computer gains humans power and intellect. This can be applied in every working environment which requires permanent operator's attention because human error is one of the major reasons for catastrophes. Blue eye is the name derived from bluetooth which provides wireless transmission of information from sensors and Eye, the most beautiful but also the most important sensory organ of the human body; 4/5th of all the impressions on the senses come from eye. Also the eyes make an essential contribution to the facial expression and communicating with other people. Thus they play a vital role in understanding human behavior.

Key Features Of Blue Eyes Technology:
- Conscious brain involvement monitoring.
- Real time user defined alarm triggering.
- Data recording.
- Use of BIOMETRICS.
- Operators position detection.
- Wireless data acquisition using bluetooth technology.

II. HARDWARE

Blue eyes technology consists of Mobile measuring device called (1) Data Acquisition Unit (DAU) and a central analytical system called (2) Central System Unit (CSU).

1) DATA ACQUISITION UNIT (DAU): Is a mobile part of the Blueeyes system. To accomplish a task the device must manage wireless Bluetooth connections (connection establishment,authentication and termination).Authorization can be provided through ID cards and PIN. All the DAU software is written in 8051 assembler code.

A. TASKS:
- Maintain Bluetooth connections
-To get information from the sensor and transfer it over the wireless connection,
-To deliver the alarm messages which are sent from the Central System Unit to the operator and handle ID cards.
B. COMPONENTS:
1. Bluetooth Module: Performs voice data compression, which results in smaller bandwidth utilization and better
sound quality.
2. Jazz Sensor: An off-shelf eye movement sensor.
3. Microcontroller: Atmel 8952 microcontroller is the core of the DAU.As Atmel is a well-established industrial standard and
provides necessary functionality (i.e. high speed serial port).
C. FEATURES:
- Mobile Measuring.
- Light Weight Device.
- Contains ID cards for operator authorization.

2) CENTRAL SYSTEM UNIT (CSU): Contains a Bluetooth module and a PCM codec for voice data transmission. The PCM codec
is an analog-digital interface for voice band signals designed with a combination of coders and decoders (codec) and filters.The
codec reduces the microcontroller's tasks by reducing the amount of data being sent over the
UART(Universal.Asynchronous.Receiver.Transmitter).UART is the interface where Communication between the Bluetooth module
and the microcontroller is carried. The module is connected to a PC using a parallel, serial and USB cable.
A. TASK:
- Maintains the other side of the Bluetooth connection.
- Buffers incoming sensor data.
- Performs on-line data analysis.
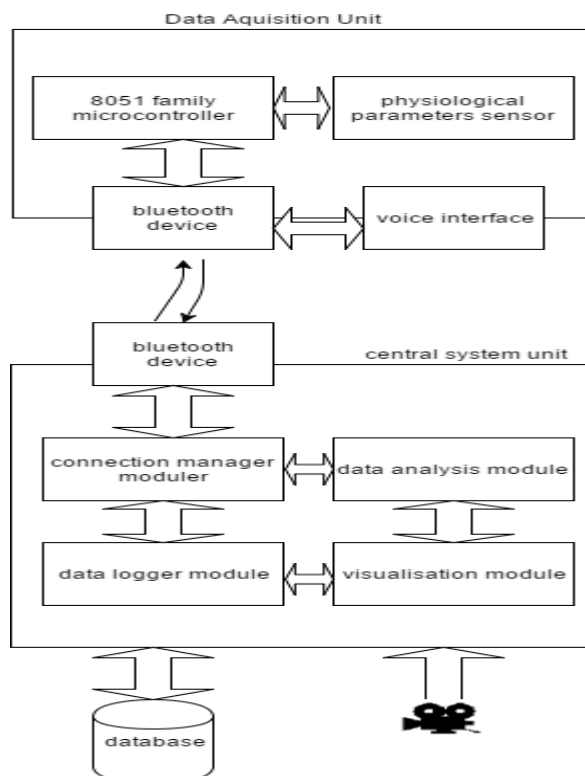- Records the conclusions for further exploration and provides visualization interface.

Fig 1, System Architecture

B. COMPONENTS:

1. Connection Manager :
  - Communication with the CSU hardware
  - Searching for new devices in the covered range
  - Establishing Bluetooth connections
  - Connection authentication
  - Incoming data buffering
  - Sending alerts

2. Data Analysis module: Performs the analysis of the raw data from sensor to get information about the user's condition. It runs separately and supervises each operator activities. The module consists of a number of smaller analyzers extracting different types of information. The most important analyzers are:

-     Saccade detector - Monitors eye movements to determine the level of operator's visual attention.
-     Pulse rate analyzer - Uses blood oxygenation signal to calculate operator's pulse rate.
-     Custom analyzers - Recognize other behaviors than those which are built-in the system. The new modules are created using C4.5 decision tree induction algorithm.

3. Visualization module : Gives a user interface for the supervisors. It enables them to watch each of the working operator's physiological condition along with a preview of selected video source and their recorded audio file. All the incoming alarm messages are instantly signaled to the supervisor. The Visualization module can be set in an offline mode, where all the data is fetched from the database. Watching all the recorded physiological parameters, alarms, video and audio data the supervisor is able to reconstruct the course of the selected operator's duty. The physiological data is depicted using a set of custom-built GUI controls:

  - A pie-chart used to present a percentage of time the operator was actively acquiring the visual information.
  - A VU-meter showing the present value of a parameter time series displaying a history of selected parameters value.

III. EMOTIONAL SENSORS

For Hand	For Eye	For Speech
1)Emotional Mouse	1)Expression glasses	1)Artificial Intelligence
2) Sentic Mouse	2)MAGIC pointing	

A. Emotional Mouse:Is an device to view and track the emotions of a user just by touching on it. It is designed to evaluate and identify the users emotions such as fear, surprise, anger, sadness, happiness, disgust etc when he/she is interacting with computer. The main aim of the Emotion Mouse is to collect the user's physical and physiological information by just a mere touch. Pulse is taken by IR on the thumb, temperature is taken with the help of a thermistor chip, GSA(General Somatic Activity) is taken through the mouse device driver, and GSR (Galvanic Skin Response) is taken through fingertips. These values are input into a series of different function analyses and correlated to an emotional state.
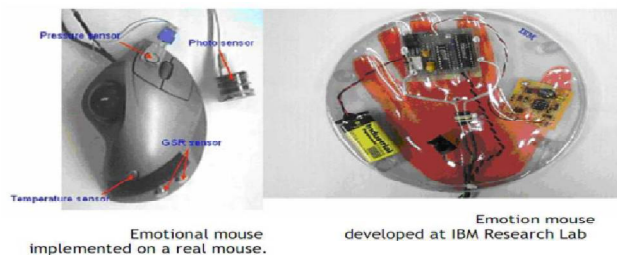
Fig 2, Emotional Mouse

B. Sentic Mouse:- Using a computer to supply the necessary stimulation to human subject, an experiment was organized which involved detailed study of all 3 feeling. A standard mouse was attached with a pressure device to gather sentic information as in Dr. Clynes experiments. The 3 measured results: sentic information, heart rate, and self-assessment, were then compared against one another as well as the data which was predicted theoretically to assess the subject's emotional valence for every slide.

Fig 3, Sentic Mouse

C. Expression Glasses:- It is a pair of wearable device that allows any viewer to see a graphical view of the wearer's facial expressions. The glasses are having capacity of learning an individual's expression patterns and discriminating between various expressions like confusion and interest expressions. This is implemented through two small pieces of piezoelectric film imbedded in the frames, the muscle movements in the region near eyebrow is measured and translated to a full-color visual display.

Fig 4, Expression Glasses

D. Magic Pointing- The selection and pointer of the cursor is primarily controlled by manual way and is also guided by a gaze tracking mechanism commonly known as MAGIC Pointing. The main aim of MAGIC pointing is to use gaze to warp the previous position (home) of the cursor to the locality of the target, reasonably where the user was looking at, so as to lessen the motion amplitude of cursor which is required for target selection. When the position of cursor is identified, only a small movement is needed by the user to click on the target by a manual input device that is to achieve Manual Acquisition with Gaze Initiated Cursor or Manual and Gaze Input Cascaded (MAGIC) pointing.
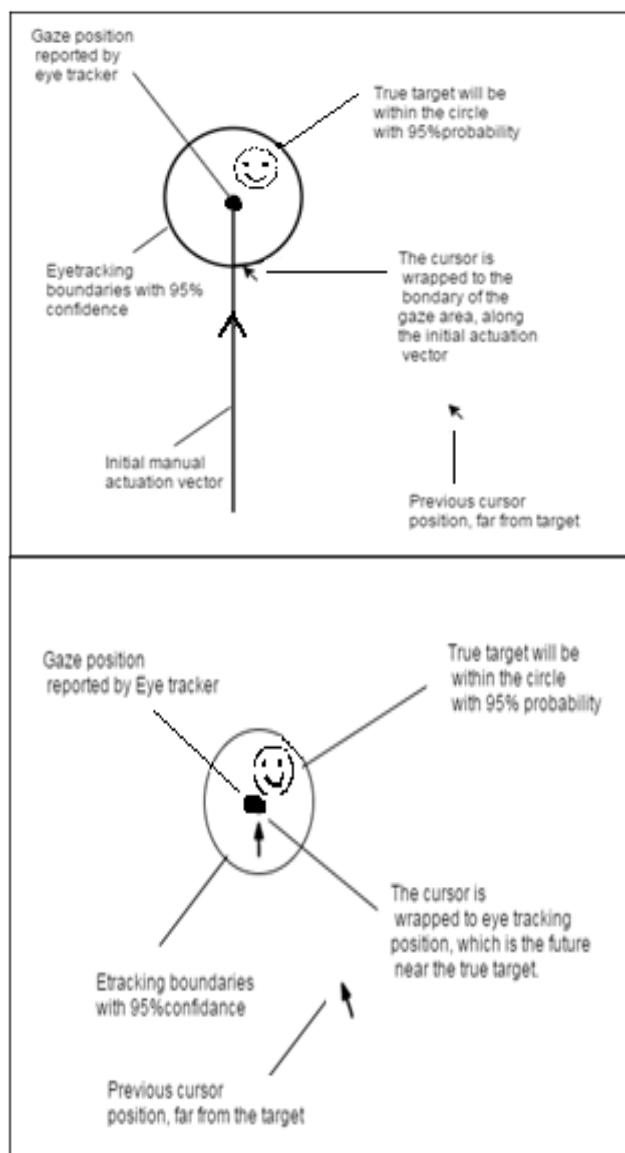
Fig 5, Magic Pointing

E. Speech Recognisation using Artificial Intelligence:- First, it involves studying the thought processes of human beings. Second, it deals with representing those processes via machines (like computers, robots, etc). A.I. is behavior of a machine which, if performed by a human being, would be called intelligent. It makes machines smarter and more useful, and is less expensive than natural intelligence. Natural language processing (NLP) refers to artificial intelligence methods of communicating with a computer in a natural language like English. The main objective of a NLP program is to understand input and respond accordingly. The input words are scanned and matched against internally stored known words. Identification of a keyword causes some action to be taken. In this way, one can communicate with the computer in one's language. No special commands or computer language are required. There is no need to enter programs in a special language for creating software.

IV. 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.

V. CONCLUSION

Humans are not perfect, we all are liable to error. We fail drastically now and then. A tiny little mistake committed accidentally will cause disasters. Machines are often useful in preventing the mistakes and correcting the errors of human. The opinion regarding machines as being difficult and tough to handle and understand has been modified by blueeyes. User-friendliness is increased in computing devices by this technology. The gap between the physical and electronic world is decreasing to minimum. In future, ordinary household devices may be able to do their job just as we say to them and also understand our psychological state by this technology.

REFERENCES

1. Blue Eyes Technology, Chandani Suryawanshi1 T. Raju2 1, 2Dept. of Wireless Communication & Computing .IJSRD - International Journal for Scientific Research &Development| Vol. 2, Issue 01, 2014 | ISSN (online): 2321-0613
2. Vision System of Blue Eyes Kritika R.Srivastava, Karishma A. Chaudhary, Prof. H.J.Baldaniya Computer Engineering Department, Government Polytechnic For Girls, / India,International Journal of Emerging Research in Management & Technology
3. Srishti Khanna, Karan Bakshi and Shikha Klair. Article: The Blue Eyes Technology. IJCA Proceedings on 2nd National Conference on Information and Communication Technology NCICT(3):, November 2011.
4. Chandani Suryawanshi T. Raju, Blue Eyes Technology S.Madhumitha, IJSRD - International Journal for Scientific Research & Development| Vol. 2, Issue 01, 2014
5. http://www.yuvaengineers.com/blue-eyes-maram-b-m-rajesh-kumar/
6. Overview of Blue Eyes Technology Deeksha Rajvanshi B.Tech student, Department of Electrical Engineering, G.B Pant University of Agriculture and Technology Pantnagar, Uttarakhand, India.
7. International Conference on Emerging Trends in Technology, Science and Upcoming Research in Computer Science DAVIM, Faridabad, 25th April, 2015 ISBN: 978-81- 931039-3- 7 838 | Page BLUE EYES TECHNOLOGY Swati Assistant Professor, Dept of CS, C.R.M. JAT PG College Hissar, Haryana (India)
8. Blue Eyes - Monitoring Human Operating System , M . Revanth, B.e Eee/third Year, Valliamai Engineering College.
9. http://www.slideshare.net/jainshef/blue-eye-technology
10. http://www.scribd.com/doc/13763040/Blue-Eyes-Technology.
11. http://www.penniblack56.gratisphphost.info/blue-eyes-technology
12. http://www.fixya.com/