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A Comprehensive Study on Techniques Used in Blue Eyes Technology

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Abstract: We do have a human partner. But is it possible to make a computer as your companion? This problem was solved by a research team of IBM at Almaden Research Centre. They conducted the BLUE EYES TECHNOLOGY which aims at designing computational machines that have perceptual and sensory abilities similar to those of human beings. Through this Tech the computer system understands the six basic human emotions (anger, disgust, fear, surprise, sadness and happiness) using various techniques by analysing our blood pressure, temperature, heartbeat etc. We could create machines with emotional quotient. Blue eyes tech creates a PAN (personal area network) using Bluetooth, understand human emotions and empower the computer system.

Keywords: Blue eyes technology, Techniques: Emotion mouse, MAGIC, AISR, SUITOR, DAU, CSU.

I. INTRODUCTION

The term BLUE stands for Bluetooth and Eyes refers to our eye moment. So, in brief the computers build with Blue Eye technology observes a human's eye movement and understands its emotions through a Bluetooth connection. The monitoring's and recognitions like visual attention monitoring, psychological monitoring, gesture recognition, facial recognition, speech recognition, eye recognition etc. are observed and connected via Bluetooth network and will be send to the machines. This is how the machines could understand our feelings. The main aim behind this development is to provide the computer human potentials. Blue eyes technology overcome the limitations of humans like: tiredness, mental illness, laziness etc.

In the modern era people just spare most of the time in front of computers, laptops, mobile phones etc. So, by giving human power or abilities to computer, the machine can naturally interact with humans. Imagine a delightful world! where humans join forces with computers. The machine can understand the needs of user and act according to his emotional states. Using this technology we can turn computers into our personal assistant, who stand by our side and treat u according to your needs. That's the simple concept of blue eye technology.

II. MATERIALS AND METHODS

This segment sheds light on the techniques used in Blue Eyes Technology that we have utilized to form the proposed approach, and after that we clarify completely our proposed method. Various techniques used in blue eyes tech are:

1. Emotion mouse
2. Manual and gaze input cascaded (MAGIC)
3. Artificial Intelligence speech recognition (AISR)
4. Simple user interest tracker (SUITOR)
5. Eye movement Sensor

A. Emotion mouse

The emotional mouse is like the ordinary mouse we can use in our normal computer, but it has many useful components to detect the user's feeling. These types of mice include features like face recognition, gestures, eye tracking, and more. It has a pass-through mechanism to adapt to different moods of users. Compared with the other devices in the blue eye technique, this emotional mouse has the highest performance. It has a brain-computer interface (BCF). This BCF is very helpful in making the system intelligent and adoptive. Emotion Mouse is designed to evaluate and identify your emotions such as fear, surprise, anger, sadness, happiness, and disgust as you interact with your computer. It can gather information by simple touch of the user, its sense the whole emotion and deliver information according to that recognised emotion. The emotional mouse can also be defined as an input device to track the emotions of the user by simple touch.

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Fig. 1 Emotion mouse

At Blue Eyes, machines have the ability to detect subtle changes in people's moods. Suppose a person can press the keyboard quickly or softly depending on their mood, with Blue Eyes technology machines can detect these quick changes in human emotions with a single touch of the mouse or keyboard, and machines begin to react to users according to their emotional level. this is done under the guidance of an intelligent device such as an "emotion mouse". The main goal of emotion mouse is to collect the user's physical and physiological information with a simple touch. Different sensors like: Pressure sensor, Photo sensor, GSR sensor, Temperature sensor speed up the sensing process.

B. Manual and gaze input cascaded (MAGIC)

The eyes glazing pointing mechanism is addressed by magic pointer. Eye gaze tracking methods explores a new approach to handle 'eye gaze' in man-machine interfaces. The use of gaze tracking as a pointing mechanism for providing input to the computers has been discuss. This technique provides the computer with an excellent mouse pointing approach. Traditional eye gaze monitoring technologies, however, have a number of limitations. to address these issues, a new approach is called MAGIC (Manual and Gaze Input Cascaded) is being proposed.

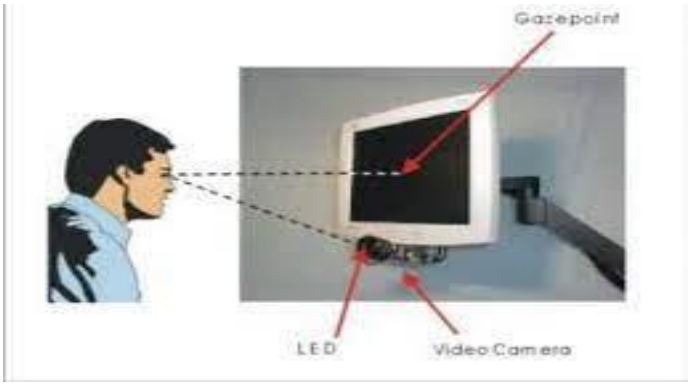

Fig. 2 MAGIC pointing technique

Eye gaze pointing appears to the user as a manual task in this method, and it is used for fine selection and manipulation activities. Even yet, bending the cursor to the eye gazing section, which surrounds the target, removes a major percentage of the cursor movement. The cursor is primarily controlled and pointed by manual means, but it is also guided by a gaze. Glaze tracking technology, which is also known as magic pointing, it can be used to manually select and control the cursor. Its benefit is that it is accurate and fast. Two magic pointing technique are Liberal and Conservative.
Advantages of MAGIC pointing Technique:

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- Compared to traditional manual pointing, there is more spontaneity
- Faster operation speed than manual pointing
- Greater accuracy

C. Artificial Intelligence Speech Recognition (AISR)

The environment is an important factor for the Speech Recognition. So many elements can affect the standard of speech include the grammar of the speaker, noise level, speed etc. Microphone is contemplated as input to collect our voice. Our speech is collected by this microphone and provides an output according to users input level.

The AI have two main ideas:

1. Study about hummus thoughts
2. Collecting the process and represent to machines.

Fig. 3 AISR technique

The AI makes the device more significant, powerful, Convenient and also cheaper than natural intelligence. The NLP (Natural language processing) feature helps the devices to communicate English. So that the computer could understand what its user needs and could respond accordingly. So many data are stored within the system and when user spoke a comment the devices will search for matches with in the stored data. And the corresponding actions are performed. In this way the blue eyes tech helps the users to interact with machines by their own language.

D. Simple User Interest Tracker (SUITOR)

SUITOR is revolutionary approach towards the design of devices having the ability to maintain an intimate relationship between the computer and the humans. SUITOR continuously reserves where the user's eyes focus on the computer screen. The SUITOR has the capability to find out the interest of its user and it provides the appropriate data to the user**.**

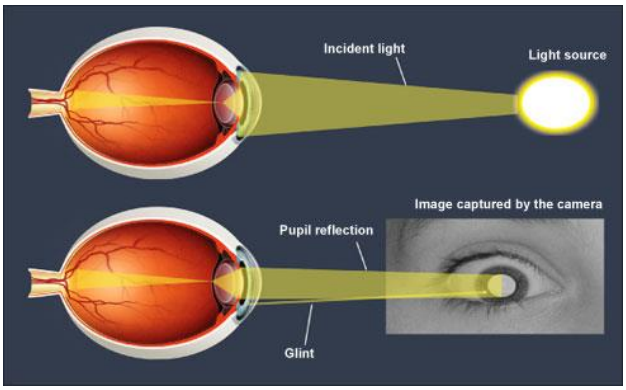

Fig. 4 SUIOR process

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The image is captured from the pupil's just like the Fig4. For example, if we read a headline of some news, suddenly the entire window pops up. SUITOR is mostly used in web-based applications.

E. Eye Movement Sensor

For measuring the point of stare or the movement of an eye, Eye tracking mechanism is used. The eye positions and eye motion are measured by a device called eye tracker. These trackers used in various researches in Psychology and some product designs. The two major units that play vital role in eye movement sensors are:

- DAU (Data Acquisition Unit)
- CSU (Central System Unit)

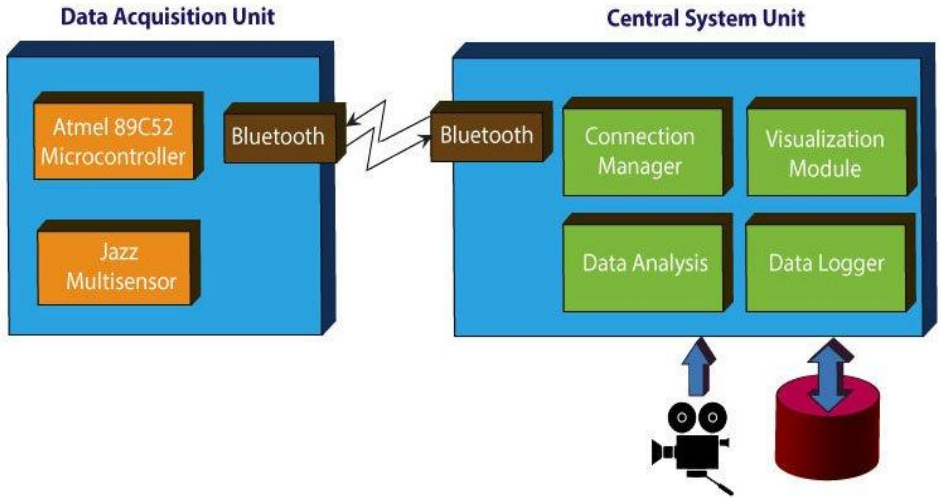

Fig. 5 DAU-CSU architecture

1) DAU (DATA ACQUISITION UNIT):

The DAU consists of the various components like: BLUETOOTH MODULE that supports synchronous voice, Data transmission, Central system sound feedback, Microcontroller (115200 bps), ALPHAUNUMERIC LCD display, LED indicators, ID CARD interface, ATMEL 8952 microcontroller.

Data Acquisition Unit is a lively part of the blue eyes system. Fetching the physiological statistics from the sensor and dispatching it to the central system is considered to be the main task of DAU. To achieve the task the device must manage wireless Bluetooth connections (authentication, connection establishment and termination). Personal ID cards and PIN codes issue operator's authorization. Transmission with the operator is fetched on using a simple 5-key keyboard, which is a small LCD display and a beeper. When an exceptional circumstance is discovered, the gadget uses them to inform the operator. Voice data is transmitted using a small headset, interfaced to the DAU with standard mini-jack plugs.

2) CSU (CENTRAL SYSTEM UNIT):

Central System Unit hardware is the second squint of the wireless connection. The hardware includes a Bluetooth module and a PCM codec for voice data transference. The element is associated to a PC using a parallel, serial and USB cable. The audio data is easily attainable through standard mini-jack sockets to program operator's personal ID cards. The coder is connected to a PC using serial and PS/2 (power source) ports. Inside, there is Atmel 89C2051 microcontroller, which performs the UART transmission and I2C EEPROM (ID card) programming.

Major components of CSU are: Connection Manager whose major task is to perform low-level blue tooth communication, Data analysis Module who performs the analysis of the raw sensor data, Data logger Module which provides support for storing the monitored data. Visualization Module which helps in providing user interface for the supervisors.

III. ADVANTAGE IN BLUE EYES TECHNOLOGY

Blue eyes tech is very prominent in current generation. This technology understands human emotions and make a connection with us. Speaking about the blue eyes technologies plus points, it has high precision and quick in pace. Comparing with manual level blue eyes tech doesn't need any physical support. This technology provides various forms

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of information. We can make proper and precise survey in biometrics field. It could identify finger print. It reduces the error compared to work done by humans in technological field. This technology even uses biometrics for accurate results. The blue eye technology can help various kinds of information systems. The main objective of the blue eye technology is geared to build a computational machine which is able to deal with some components of human beings such as having sensory and perceptual ability

IV. CHALLENGES IN BLUE EYE TECHNOLOGY

The blue eye technology doesn't provide 100% accuracy. It's not basically affordable by ordinary people. This technology could be accessed by well educated people who are experienced in handling modern technology. The technology and its cost are bulky. There are several health issues in using numerous devices in blue eyes technology like expression glass and eye tracker. It's actually not reliable and make us addicted to the technology.

V. CONCLUSION

The current generation is surrounded by various kinds of technologies. And it will be very relaxing if our gadgets understand the master's feeling and act according to it. Today's world is growing up with many technologies. Blue eyes tech is very useful in many aspects of Technology. It provides user a friendly and interactive environment. It makes the users job easy. People easily get attached to this technology because it is very easy to understand and handle. Eyes movement and wireless technology develop an interest in users towards using this technology. This technology will grow soon and will reach our mobile phones someday. In future this tech will make a unique mark in the technology market. This was a technological forecast.

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