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Blue Eyes Technology

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Abstract: ***The world of science cannot be measured in terms of development and progress. It has now reached to the technology known as "Blue eyes technology" that can sense and control human emotions and feelings through gadgets.We all have some perceptual abilities. That is we can understand each other's feelings. The BlueEyes system checks above parameters against abnormal (e.g. a low level of blood oxygenation or a high pulse rate) or undesirable (e.g. a longer period of lowered visual attention) values and triggers user-defined alarms when necessary. Therefore, the operator's voice, physiological parameters and an overall view of the operating room are recorded. This helps to reconstruct the course of operators' work and provides data for long-term analysis. For example we can understand ones emotional state by analyzing his facial expression.***

Keywords: CSU, DAU, Emotion Mouse, MAGIC, SUITOR

1. Introduction

Imagine yourself in a world where humans interact with computers. It can understand your emotions at the touch of the mouse. It verifies your feels your presents, identity, and starts interacting with you.

Human recognition depends on the ability to interpret, perceive, and sensoring information integrate audio-visuals and. We can add extraordinary perceptual abilities to computers that would enable computers to work together with human beings as strongest partners.

It uses one's opinions on otherssensing method, employing most modern video cameras and microphones to identify the user's actions through the use of imparted sensory abilities.

The name BLUE EYES itself suggest that Blue in this term stands for Blue tooth and eyes because eye movement enables us to obtain a lot of interesting and information.

1. Data Acquisition Unit

Its main task is to fetch the physiological data from the sensor and to send it to the central system to be processed. To accomplish the task the device must manage wireless Bluetooth connections. Personal ID cards and PIN codes provide operator's authorization.

2. Central System Unit

CSU maintains other side of the Blue tooth connection, buffers incoming sensor data, performs online data analysis records conclusion for further exploration and provides visualization interface.. The module is interfaced to a PC using a parallel, serial and USB cable.

Data Acquisition Unit Central System Unit

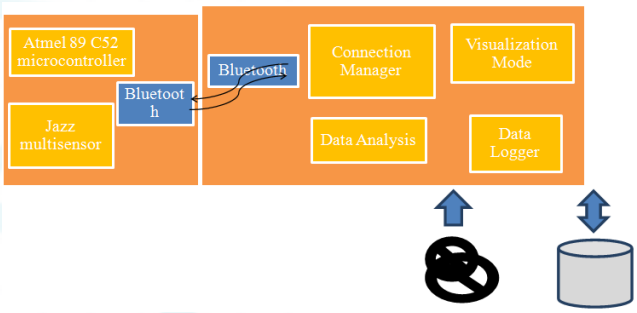

Figure 1: System Overview

Historical background

Paul Ekman's facial expression work gave the correlation between a person's emotional state and a person's physiological measurements, which described Facial Action Coding System (Ekman and Rosenberg, 1997). His experiment involved participants attached to devices to record certain measurements including pulse, galvanic skin response (GSR), temperature and somatic movement.

A) Experiment

The experiment involves devices attached to participants to record certain measurements including pulse, galvanic skin response (GSR), temperature and somatic movement. Six participants were trained to exhibit the facial expressions of the six basic emotions, anger, fear, sadness, disgust, joy and surprise. The physiological changes associated with affect were assessed and analyzed. Because of our need to incorporate these measurements into a small, non-intrusive form, we will explore taking these measurements from the hand, which requires an emotional sensor such as a mouse.

B) Results

The first analysis used multidimensional scaling (MDS) procedure to determine the dimensionality of the data and suggested that the physiological similarities and dissimilarities of the six emotional states fit within a four-dimensional model.

In the second analysis, discriminant function analysis was used to determine the mathematic function that would distinguish the six emotional states which suggested that all four physiological variables are sufficient to distinguish the six states.

3. Emotion Mouse

For Hand - Emotion Mouse:

The major aim of Brain Computer Interface (BCI) is to develop a smart and adaptive computer system. These types of project must include speech recognition, eye tracking, facial recognition, gesture recognition etc. software and hardware. In Blue Eyes, the machines have the ability to identify the minor variations in the moods of human beings. The Blue Eyes technology enables the machines to identify these minor emotional variations of human beings even by a single touch on the mouse or key board and the machines started to react with the users according to this emotional levels. This is done with the guidance of intelligent devices like "Emotion Mouse". Actually this Emotion Mouse is an input device to track the emotions of a user by a simple touch on it. The main objective of the Emotion Mouse is to gather the user's physical and physiological information by a simple touch.

Figure 2: Emotional mouse

For Eye - Expression Glass:

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 prototype used for this glass uses piezoelectric sensors.

Figure 3: Expression glass

4. Manual and Gaze Input Cascaded Pointing (MAGIC)

The Eye gaze tracking methods explores a new way for handling 'eye gaze' for man machine interfacing.But many drawbacks exist with this traditional eye gaze tracking methods. To overcome these difficulties an alternative approach – termed as MAGIC - Manual and Gaze Input Cascaded – is projected. The selection and pointing of the curser is primarily controlled by manual means but also guided by a gaze tracking mechanism and is commonly known as MAGIC Pointing.

The main aim of MAGIC pointing is to use 'gaze' to warp the previous position (home) of the curser to the locality of the target.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 accomplishMAGIC pointing. There are two MAGIC Pointing methods – conservative and liberal –in terms of cursor placement and target identification, were outlined, analyzed and executed with an eye tracker unit.

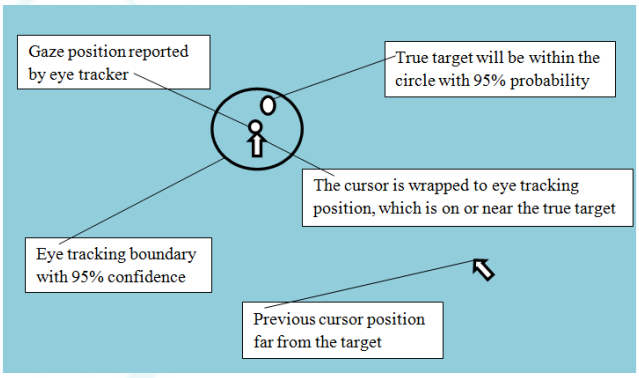

Figure 4: Liberal MAGIC pointing Technique

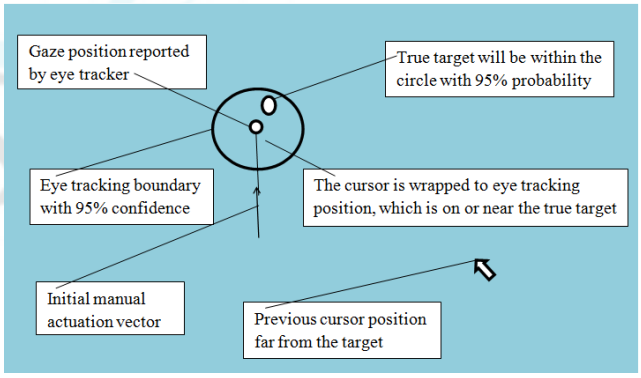

Figure 5: The conservative MAGIC pointing Technique

. 5. The Simple User Interest Tracker (SUITOR)

The SUTOR continuously analyzes the user that where his eye focus on 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

6. For Voice

Artificial Intelligent Speech Recognition

It is important to consider the environment in which the speech recognition system has to work. The more the number of filters used, the higher the probability of accurate recognition. Presently, switched capacitor digital filters are used because these can be custom-built in integrated circuit form. These are smaller and cheaper than active filters using operational amplifiers. The filter output is then fed to the ADC to translate the analogue signal into digital word. The ADC samples the filter outputs many times a second. Each sample represents different amplitude of the signal. Each value is then converted to a binary number proportional to the amplitude of the sample. A central processor unit (CPU) controls the input circuits that are fed by the ADCS. A large RAM (random access memory) stores all the digital values in a buffer area. The normal speech has a frequency range of 200 Hz to 7 kHz. Recognizing a telephone call is more difficult as it hasbandwidth limitation of 300 Hz to3.3 kHz.

Applications

The following are the applications of the Blue Eyes System.

1. At power point control rooms.
2. At Captain Bridges
3. At Flight Control Centers
4. Professional Drivers

2. Conclusion

The Blue Eyes system is developed because of the need for a real-time monitoring system for a human operator. The approach is innovative since it helps supervise the operator not the process, as it is in presently available solutions. We hope the system in its commercial release will help avoid potential threats resulting from human errors, such as weariness, oversight, tiredness or temporal indisposition. The use of a miniature CMOS camera integrated into the eye movement sensor will enable the system to calculate the point of gaze and observe what the operator is actually looking at. Introducing voice recognition algorithm will facilitate the communication.

Between the operator and the central system and simplify authorization process. Despite considering in the report only the operators working in control rooms, our solution may well be applied to everyday life situations. These new possibilities can cover areas such as industry, transportation and military command Centre's or operation theatres. Researchers are attempting to add more capabilities to computers that will allow them to interact like humans, recognize human presents, talk, listen, or even guess their feelings. Bluetooth provides reliable wireless communication whereas the eye movements enable us to obtain a lot of interesting and important information.

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