Blue Eyes Technology

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Abstract - Is it possible to create a computer, which can interact with us as we interact each other? For example imagine in a fine 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 a bad mood today. And then it opens your mail box and shows you some of the mails and tries to cheer you. It seems to be a fiction, but it will be the life lead by “BLUE EYES” in the very near future. The basic idea behind this technology is to give the computer the human power. We all have some perceptual abilities. The technology which are used in Blue Eye Technology can understand our emotion at the mouse, it verifies our identity, feel our presents and start interacting with us. In this paper a discussion of new techniques known as Emotion Sensory world of Blue Eye Technology which identify human emotion (sad, happy, surprised) using image processing technique. That is we can understand each other’s feelings. For example we can understand ones emotional state by analyzing his facial expression. If we add these perceptual abilities of human to computers would enable computers to work together with human beings as intimate partners. The “BLUE EYES” technology aims at creating computational machines that have perceptual and sensory ability like those of human beings.

I. INTRODUCTION

Imagine yourself in a world where humans interact with computers. You are sitting in front of your personal computer that can listen, talk, or even scream aloud. It has the ability to gather information about you and interact with you through special techniques like facial recognition, speech recognition, etc. It can even understand your emotions at the touch of the mouse. It verifies your identity, feels your presents, and starts interacting with you. You ask the computer to dial to your friend at his office. It realizes the urgency of the situation through the mouse, dials your friend at his office, and establishes a connection. The BLUE EYES sensor technology aims at creating computational machines that have perceptual and sensory ability like those of human beings. The machine can understand what a user wants, where he is looking at, and even realize his physical or emotional states. The U.S. computer giant, IBM has been conducting research on the Blue Eyes technology at its Alma den Research Center (ARC) in San Jose, Cal if, since 1997.³ The primary objective of the research is to give a computer the ability of the human being to assess a situation by using the senses of sight, hearing and touch. Animal survival depends on highly developed sensory abilities. Likewise, human cognition depends on highly developed abilities to perceive, integrate, and interpret visual, auditory, and touch information. Without a doubt, computers would be much more powerful if they had even a small fraction of the perceptual ability of animals or humans. Adding such perceptual abilities to computers would enable computers and humans to work together more as partners. Toward this end, the Blue Eyes project aims at creating computational devices with the sort of perceptual abilities that people take for granted. Thus Blue eyes are the technology to make computers sense and understand human behavior and feelings and react in the proper ways.

II. SYSTEM OVERVIEW

Fig-1
A. Data Acquisition Unit (DAU)

The DAU used in the Blue Eyes technology is the mobile component of the system. The device uses a five-key keyboard, beeper and LCD display for the interaction with the operators and if, any unwanted situation occurs, the machine uses these devices to inform the operators. The Data is collected in DAU and then it is transferred to CSU which is shown in fig-1. Data Acquisition Unit’s main objective is to acquire data with the aid of numerous sensors such as beepers, LCD screens, LED indicators, etc., and to transfer all that data to CSU with the help of Bluetooth. It uses Atmel 89C52 as its principal component. The Central System Unit’s task is to analyse and process the data sent by DAU. It also performs access verification and system maintenance. Data Acquisition Unit is a mobile part of the Blue eyes system. 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 connection as (connection establishment, authentication and termination). Personal ID cards and PIN codes provide operator’s authorization. Communication with the operator is carried on using a simple 5-key keyboard, a small LCD display and a beeper. When an exceptional situation is detected the device uses them to notify the operator. Voice data is transferred using a small headset, interfaced to the DAU with standard mini-jack plugs.

B. Central System Unit (CSU)

The CSU is the next square of wireless-network connection in the Blue Eyes technology. The CSU mainly contains codec (PCM Codec commonly used for voice information transmission) and a wireless blue tooth module. This CSU section is integrated to a personal computer using USB, parallel and serial cable. The mini-jack socket is used for audio data accessing. The program containing the operators personal ID is amalgamating to the personal computer through the serial and power ports. The microcontroller (Atmel- 89C2051) inside the unit handles the I2C EEPROM- programming and UART transmission. Central System Unit hardware is the second peer of the wireless connection. The box contains a Bluetooth module (based on ROK101008) and a PCM codec for voice data transmission. The module is interfaced to a PC using a parallel, serial and USB cable. The audio data is accessible through standard mini-jack sockets to program operator's personal ID cards we developed a simple programming device. The programmer is interfaced to a PC using serial and PS/2 (power source) ports. Inside, there is Atmel 89C2051 microcontroller, which handles UART transmission and I2C EEPROM (ID card) programming.

III. ARTIFICIAL INTELLIGENT SPEECH RECOGNISATION

The blue eyes technology works on Artificial Intelligence. It aims to give human abilities to a computer. A research team of IBM has come up with this technology to make a computer understand and sense human feelings and behavior. Artificial intelligence (AI) involves two basic ideas. It involves studying the thought processes of human beings. 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 initiate action. The input words are scanned and matched against internally stored known words. Identification of a key word causes in some action to be taken. In this way, one can communicate with the computer 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. EMOTION COMPUTING

Different emotion types are detected through the integration of information from facial expressions, body movement and gestures, and speech. The technology is said to contribute in the emergence of the so-called emotional or emotive Internet.

Types of Emotion sensors:

A. Hand:

1) Emotion mouse:

Emotion mouse is an input device that looks like a conventional mouse but it serves the purpose of evaluating the emotions of the user which is shown in fig-2. It has pressure, photo, temperature, and GSR sensors that can classify a user's emotions into different categories like - fear, surprise, anger, sadness, happiness, disgust, etc. Emotion mouse is an input device that looks like a conventional mouse but it serves the purpose of evaluating the emotions of the user. It has pressure, photo, temperature, and GSR sensors that can classify a user’s emotions into different categories like - fear, surprise, anger, sadness, happiness, disgust, etc. while the user is interacting with the computer. One proposed, non invasive method for gaining user information through touch is via a computer input device, the mouse. This then allows the user to relate the cardiac rhythm, the body temperature, electrical conductivity of the skin and other physiological attributes with the mood. This has led to the creation of the “Emotion Mouse”. The device can measure heart rate, temperature, galvanic skin response and minute bodily movements and matches them with six emotional states: happiness, surprise, anger, fear, sadness and disgust. The mouse includes a set of sensors, including infrared detectors and temperature-sensitive chips. These components, User researchers’ stress, will also be crafted into other commonly used items such as the office chair, the steering wheel, the keyboard and the phone handle. Rosalind Picard (1997) describes why emotions are important to the computing community.
There are two aspects of affective computing: giving the computer the ability to detect emotions and giving the computer the ability to express emotions. Not only are emotions crucial for rational decision making as Picard describes, but emotion detection is an important step to an adaptive computer system. Adaptive, smart computer system has been driving our efforts to detect a person’s emotional state. An important element of incorporating emotion into computing is for productivity for a computer user.

2) Sentic mouse:

It is a modified computer mouse that includes a directional pressure sensor for aiding in recognition of emotional valence (liking/attraction vs. disliking/avoidance) which is shown in fig-3.

Sentic mouse is also an extension to computer mouse having directional pressure sensors giving conventional mouse the ability to measure emotional valence i.e. to sense attraction or avoidance for objects present on the computer screen.

B. Eye Expression glass:

A wearable device which allows any viewer to visualize the confusion and interest levels of the wearer.[2] Other recent developments in related technology are the attempt to learn the needs of the user just by following the interaction between the user and the computer in order to know what he/she is interested in at any given moment which is shown in fig-4. Expression glasses are wearable devices that help in determining what the user is interested in at a particular time by analysing the interaction between user and computer.
These glasses remember what the user is watching and also catch the facial expressions of the user at that time. Combining that visualization with the emotion of the user gives the level of interest a user has for that thing. One of its prototypes used piezoelectric sensors. A wearable device which allows any viewer to visualize the confusion and interest levels of the wearer. Other recent developments in related technology are the attempt to learn the needs of the user just by following the interaction between the user and the computer in order to know what he/she is interested in at any given moment.

V. THE SIMPLE USER INTEREST TRACK(SUITOR):

Computers would have been much more powerful, had they gained perceptual and sensory abilities of the living beings on the earth. What needs to be developed is an intimate relationship between the computer and the humans which is shown in fig-5. And the Simple User Interest Tracker (SUITOR) is a revolutionary approach in this direction. By simply noticing where the user’s eyes focus on the computer screen, the SUITOR can be more precise in determining his topic of interest. It can even deliver relevant information to a handheld device. The success lies in how much the suitor can be intimate to the user. IBM’s BlueEyes research project began with a simple question, a manager in Almaden's USER group: Can we exploit nonverbal cues to create more effective user interfaces? One such cue is gaze—the direction in which a person is looking.

Flickner and his colleagues have created some new techniques for tracking a person's eyes and have incorporated this gaze-tracking technology into two prototypes. One, called SUITOR (Simple User Interest Tracker), fills a scrolling ticker on a computer screen with information related to the user’s current task. SUITOR knows where you are looking, what applications you are running, and what Web pages you may be browsing. "If I'm reading a Web page about IBM, for instance,” says Paul Maglio, the Almaden cognitive scientist who invented SUITOR, "the system presents the latest stock price or business news stories that could affect IBM. If I read the headline off the ticker, it pops up the story in a browser window. If I start to read the story, it adds related stories to the ticker. That's the whole idea of an attentive system—one that attends to what you are doing, typing, reading, so that it can attend to your information needs."

CONCLUSION

The nineties witnessed quantum leaps interface designing for improved man machine interactions. The BLUE EYES technology ensures a convenient way of simplifying the life by providing more delicate and user friendly facilities in computing devices. Now that we have proven the method, the next step is to improve the hardware. Instead of using cumbersome modules to gather information about the user, it will be better to use smaller and less intrusive units. The day is not far when this technology will push its way into your house hold, making you more lazy. It may even reach your hand held mobile device. Any way this is only a technological forecast.
REFERENCES


[2] Raghvendra Priyam, Rashmi Kumari, Dr. Prof Videh Kishori Thakur, “Artificial Intelligence Applications for Speech Recognition”.
