BLUE EYES......
Agenda

i. Motivation
ii. What is Blue Eye technology?
iii. Emotion Mouse
iv. System Designing
v. System Overview
vi. Data acquisition Unit
vii. Control system Unit
viii. Emotion and Computing
ix. Research
x. Manual and Gaze Input Cascade Pointing
xi. Pros and Cons of Conservative over Liberal Technique
xii. Artificial Intelligence Speech Recognition
xiii. Data Security
xiv. Advantages & Benefits
xv. What Blue Eyes Cant Do?
xvi. Conclusion
xvii. References
What is Blue eyes Technology?

- The BLUE EYES technology aims at creating computational machines that have perceptual and sensory ability like those of human beings.

- Blue eyes uses sensing technology to identify a user’s actions and to extract key information.

- Information is then analyzed to determine the user’s physical, emotional or informational state.
Emotion mouse

- Sensors in the mouse, sense the physiological attributes which are correlated to emotions using correlation model.
- By simply touching the mouse, the computer will be able to determine a person’s emotional state.
- Therefore by giving the computer a longitudinal understanding of the emotional state of its user, the computer could adopt a working style which fits with its user’s personality. The result would be increased productivity for the user.
System Designing

· There are THREE groups of users :-

· [1] OPERATOR - A person whose physiological parameters are
  ➢ Supervised
  ➢ Authorization in the system

· [2] SUPERVISOR - A person responsible for analyzing operator’s
  ➢ Condition
  ➢ Performance.

· [3] SYSTEM ADMINISTRATORS- Maintains the system and deliver tools for
  ➢ New operator’s to the database
  ➢ Defining alarm conditions
  ➢ Configuring logging tools
  ➢ Creating new analyzer modules
System Designing

- A personal area network for linking all the operators and the supervising system.

- Two major units
  - DAU (Data Acquisition Unit)
  - CSU (Central System Unit)
System overview

- **Data Acquisition Unit**
  - Atmel 89C52 Microcontroller
  - Multisensor (JAZZ)

- **Central Unit**
  - Bluetooth Connection Manager
  - Visualization
  - Data Analysis
  - Data Logger
The DAU consists of the following components –

- ATMEL 8952 Microcontroller
- BLUETOOTH MODULE – Supports synchronous voice data transmission
- PCM CODEC – Used to transmit operator’s voice and central system sound feedback
- UART – Communication between Bluetooth Module and Microcontroller (115200 bps)
- Alphanumeric LCD display
- LED Indicators
The CSU consists of the following components –

- **CONNECTION MANAGER** – Main task to perform low-level blue tooth communication.
- **DATA ANALYSIS MODULE** – Performs the analysis of the raw sensor data in order to obtain information about operator’s physiological condition.
- **DATA LOGGER MODULE** – Provides support for storing the monitored data.
- **VISUALIZATION MODULE** – Provides user interface for the supervisors.
Emotion And Computing

- Two aspects of effective Computing-
  - Giving the Computer the ability to detect emotions.
  - Giving the Computer the ability to express emotions.

- By matching a person’s emotional state and the context of the expressed emotion, over a period of time the person personality’s is being exhibited.
The correlation btw a person’s emotional state and his physiological measurements can be found out.

Researchers have defined -
- Emotions as Anger, Fear, Sadness, Disgust, Joy, Surprise.
- Physiological Measurements as Pulse, Galvanic Skin Response(GSR), Temperature and Blood Pressure.

Measuring the above parameters one can determine how physiological measures could be used to distinguish various emotional states, using a correlation model.
Manual And Gaze Input
Cascaded pointing

- Gaze tracking is a potentially superior pointing method for computer input. With MAGIC pointing appears to the user to be a manual task, it is used for fine manipulation and selection.

- There are two specific MAGIC pointing techniques –
  - The liberal MAGIC pointing technique
  - The conservative MAGIC pointing technique

- It offers following advantages-
  - Reduced physical effort and fatigue since the cross screen long distance cursor movement is eliminated from manual control.
  - Greater accuracy.
  - A more natural mental model for the user.
  - It is FASTER as compared to pure manual pointing.
  - Improved subjective speed and ease-of-use.
Manual And Gaze Input
Cascaded pointing

- The liberal MAGIC pointing technique: Cursor is placed in the vicinity of a target that the user fixates on. Actuate input device, observe the cursor position and decide in which direction to steer the cursor. The cost to this method is the increased manual movement amplitude.

- The conservative MAGIC pointing technique: To initiate a pointing trial, there are two strategies available to the user. One is to follow “virtual inertia:” move from the cursor’s current position towards the new target the user is looking at. This is likely the strategy the user will employ, due to the way the user interacts with today’s interface. The alternative strategy, which may be more advantageous is to ignore the previous cursor position and make a motion which is most convenient and least effortful to the user for a given input device.
Manual And Gaze Input
Cascaded pointing

Figure 1. The liberal MAGIC pointing technique: cursor is placed in the vicinity of a target that the user fixates on.

Figure 2. The conservative MAGIC pointing technique with “intelligent offset”
Pros and Cons of Conservative over Liberal Technique

- **Pros** -
  - The cursor would never be over-active and jump to a place the user does not intend to acquire.

- **Cons** -
  - It may require more hand-eye coordination effort.
Manual And Gaze Input
Cascaded pointing

- However there are two fundamental shortcomings in this method-
  - First, given the one-degree size of the fovea and the subconscious jittery motions that the eyes constantly produce, eye gaze is not precise enough to operate UI widgets like scrollbars, hyperlinks and slider handles.
  - Secondly, the eye has not evolved to be a control organ. Sometimes its movements are voluntarily controlled while at other times it is driven by external events.
Artificial Intelligent Speech Recognition

- Artificial Intelligence (AI) involves two basic ideas-
  - First it involves studying the thought processes of human beings.
  - Second, it deals with representing those processes via machines.
- Natural Language Processing (NLP) refers to artificial methods of communicating with a computer in a natural language like English. Its objective is to understand input and initiate action.
Artificial Intelligent Speech Recognition

- Applications –
  - It lets user do other works simultaneously.
  - It is widely used in military operations. For example, voice control of weapons.
  - It is used in medical areas like by a radiologist scanning hundreds of X-rays, CT scans and simultaneously dictating conclusions to a speech recognition system connected to word processors.
  - It can also be used on computers for making airline and hotel reservations.
Data Security

- Only registered mobile device can connect to the system.
- Bluetooth connection authentication.
- Bluetooth connection encryption.
- Personal and physiological data encryption.
advantages

- Generic control rooms
  · (System can be applied in every working Environment requiring permanent operator’s attention)
- Power station
- Flight control centers
- Operating theatres – Anesthesiologists
- Automobile Industry
What BLUE EYES cant do?

- Doesn’t predict nor interfere with operator’s thoughts
- Cannot force directly the operator to work
conclusion

The nineties witnessed quantum leaps in interface designing for improved man machine interaction. The BLUE EYES technology ensures a convenient way of simplifying the life by providing more delicate and user friendly facilities in computing devices. 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.
references

1) www.ibmresearchcenter.com

2)

3) Blue Eyes Technology and Applications, Business Solutions.

4)

5) Blue Eyes Technology, Computer Edge.

6)

7) www.almaden.ibm.com

Thank you....