Technology outlook

Human Computer Interaction

Human computer interaction is one of the keys for future technology. Driving factors are:

- The miniaturisation of devices where no area is left for display units
- The ubiquitous computer used in everyday life by everyone
- Special situations where focus must not be disturbed
  - in the car, driving
  - during surgery
  - etc

Easy-to-use and an intuitive interaction with the computer is an increasingly important demand in the near future.

Obviously the old keyboard and monitor is not the only option for the future.

Are there any emerging technologies about this?

Human Computer Interaction

Electronic ink/Digital paper

The aim is to show electronic text on thin, flexible sheets that look and feel like paper. The sheet can be overwritten and even serve as a touch screen connected to PC's, Mobiles etc.

from Bell Labs and E Ink Corporation

The display components are stamped on to a thin, flexible sheet of plastic less than a millimetre thick. And the inventors are confident that their technology will scale down to the sizes needed to make useful electronic paper.

An emerging area with 3-4 years before commercial quality products are available

Human Computer Interaction

Retinal Display

Uses the retina in the eye as a display. By displaying an image directly onto the retina it can be viewed as being part of our sight on pleasant distance from the eye. Useful for Mobile phones and wearable computers with small displays. See also Augmented reality.

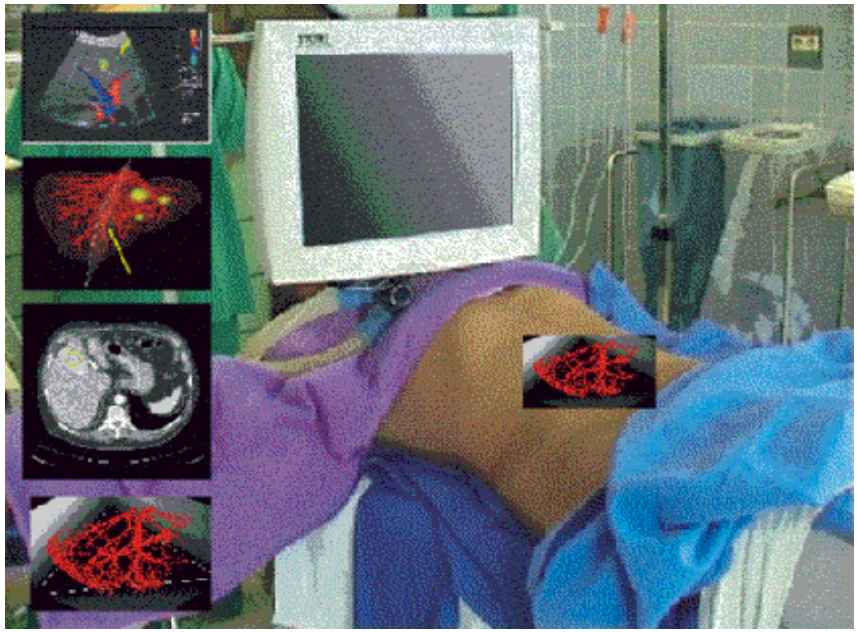
Lansing Evans, project manager for Nomad, Microvision's first commercial retinal scanning display product, models a prototype.
The laser device projects information onto the retina.

Emerging area with about 5 years before commercial quality products are available. Probably earlier for the game market.

Human Computer Interaction

Augmented reality

While Virtual Reality is invented or simulated, Augmented Reality is a real image with superimposed information on it. Probably will Retinal Display be the main display technique for this. Here with an example from surgery:



A possible view of the surgery area, with an head mounted display.

Virtual Retinal Display: Nomad Personal Display System made by MICROVISION

An emerging area with about 5 years before the first commercial products are available

Human Computer Interaction

Augmented reality (BMW at CeBit)

BMW showed a prototype, at the CeBit exhibition (Mars 2004), with the aim to bring 3D models into dealer workshops combined with a real-time camera and human interaction.

The technique used is Augmented Reality with Retinal Display.

Human Computer Interaction

Speech recognition

Computer systems that can recognize spoken words. This implies only that the computer can take dictation, not that it *understands* what is being said. Because of their limitations and high cost, speech recognition systems have traditionally been used only in a few specialized situations. Increasingly, however, as the cost decreases and performance improves, speech recognition systems are entering the mainstream and are being used as an alternative to keyboards:

- For Mobile and wearable devices
- Telephony & Call centers
- For the PC
- In the vehicles

http://commons.wikimedia.org/wiki/File:Basankusu_woman_mobile_phone.jpg

Already in use. For call centers less than 2 years before it's a mature technology. Another 2 years for Mobiles and PC's.

Human Computer Interaction

Text-to-speech/Synthetic speech

Computer systems that automatically generates a synthetic voice from a text.

In principle, speech synthesis may be used in all kind of human-machine

interactions. For example:

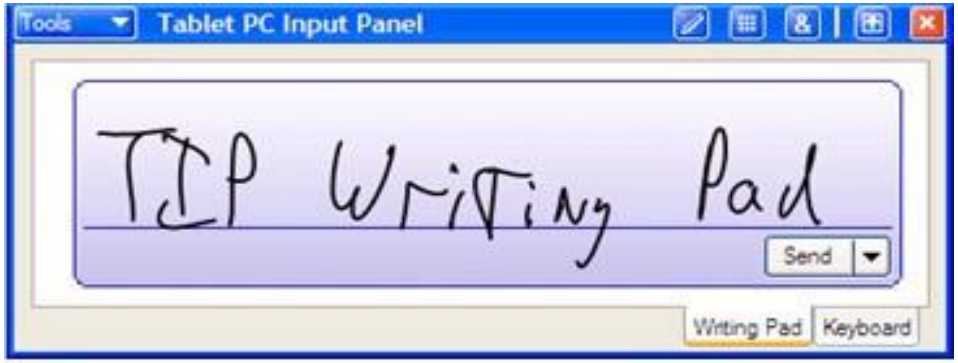
- Receiving information when calling user self service functions
- In warning and alarm systems synthesized speech may be used to give more accurate information of the current situation. Using speech instead of warning lights or buzzers gives an opportunity to reach the warning signal for example from a different room.
- Receive desktop messages from a computer, such as printer activity or other jobs
- Received e-mail read by voice.
- Spoken information from mobile phones and other devices.

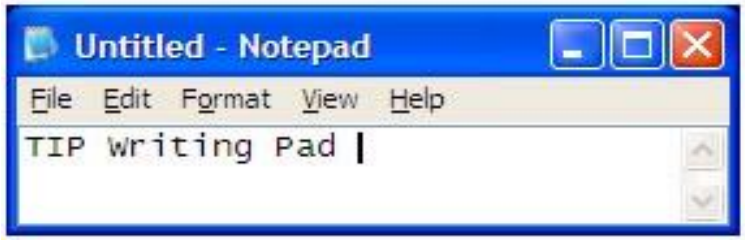
Already in use with fairly good quality. Further development will make it even better and more human like. Less than 2 years before it's a mature technology

Human Computer Interaction

Handwriting recognition

The technique by which a computer system can recognize characters and other symbols written by hand. In theory, handwriting recognition should free us from our keyboards, allowing us to write and draw in a more natural way. To date, however, the technology has had only a limited success. Many people can write much faster with a keyboard than they can by hand.





Already in use. 2-5 years before it's a mature technology