Television, Internet -- what's next?

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Watch 3-D television without stereo glasses, use screens with-out touching them, download video with no loss of quality – in future this will be the norm for media technology. At the IFA consumer electronics fair in Berlin, the Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut, HHI, will be demonstrating how.

Humans can see in three dimensions soon after birth. The brain converts the two-dimensional images supplied by each eye into a single spatial image. To watch a film in 3-D, viewers have hitherto needed a pair of special glasses. Cinemagoers may be happy with this, but at home nobody wants to sit in front of the TV or PC wearing a pair of 3-D glasses.

The Multi-User 3-D Television Display developed by the European consortium MUTED eliminates the need for those annoying glasses. It reproduces natural vision for three to four people.

“The display always needs to know exactly where the viewers’ eyes are,” explains Klaus Schenke from the HHI, who is responsible for the exhibition stand at the IFA. “The eye positions correspond to the two viewpoints from which the three-dimensional image is scanned or computed. At the IFA we will be showcasing our head-tracking system. This represents a major contribution to the 3-D television display because it replaces viewing aids of any kind.”

To date, the display has been geared to a maximum of six eyes, in other words three viewers. The main application is aimed at private use,

“particularly 3-D television,” says Klaus Schenke. “In future, though, it will also be possible to use the display in the medical arena, for minimally invasive surgery.” It will track the various positions of the surgeon, intern and nurse, for instance, so that all three can follow the operation simultaneously on the same screen with three-dimensional images.

In addition to 3-D viewing without glasses, the HHI will also be presenting a contactless touchscreen at the IFA.

“Conventional touchscreens are only suitable with a small screen. Viewers need to see all the information at close range so that they can touch the screen, like the ticket machines in train stations,” is how Klaus Schenke describes the challenge.

But the HHI is looking further ahead and aims to provide travelers with more information, such as location maps and sights worth seeing, on a larger screen. To do this the Institute has developed a “virtual” touchscreen, the iPoint Explorer. The “i” stands for “information”; this information is retrieved by pointing a finger. The gestures are captured by cameras on the display. “As a result, the user can stand up to 1.5 meters away and even view screens with a 62-inch diagonal,” says Klaus Schenke. A further advantage is that, not being touched by thousands of people, the iPoint Explorer is more hygienic.

Another HHI research area presented at the IFA is video encoding. Although downloading videos from the Internet is nothing unusual nowadays, the numerous digital transmission paths and devices on which the audiovisual data can be transmitted still present a technical challenge. Wireless home networks in particular are becoming increasingly powerful and important. But not all content is equally suited to large-screen and pocket formats. The video material needs to be adapted accordingly to provide optimum image quality. Under the existing

encoding standards, all the parameters, such as image resolution or size, are precisely defined from the outset and must be fully downloaded.

The HHI has now managed to make encoding scalable. “There is a choice of multiple resolutions, different image frequencies and variable image quality within the same bitstream,” explains Karsten Grüneberg, scientist at the HHI and member of the European Union’s ASTRALS research project. “Users decide themselves which parts of the bitstream they want to transmit, depending on the transmission path or terminal device.”

The HHI will also be presenting other developments in tomorrow’s media world such as a virtual mirror for augmented reality and the pocket PC photo browser.

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