



A new multiuser interaction technology

MightyTrace

Ramon Hofer, Andreas Kunz



Towards new interaction possibilities

At the ICVRs Lab, a new technology was developed which supports multi-user interaction on large LC-displays.

Teamwork

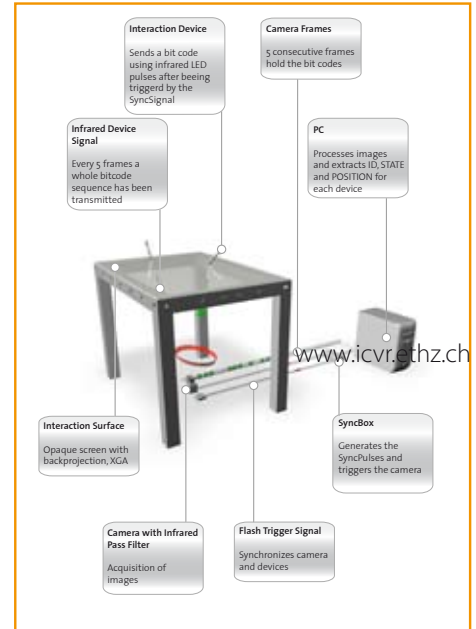
Within team meetings, vertical and horizontal digital interaction spaces are often used. While the interaction on vertical workspaces can be easily supported by today's hardware devices, a multi-user interaction or an intuitive and ergonomic working on horizontal interaction spaces is not possible yet. However, such an interaction is typically required in small and medium-sized workgroups.

box CRION).

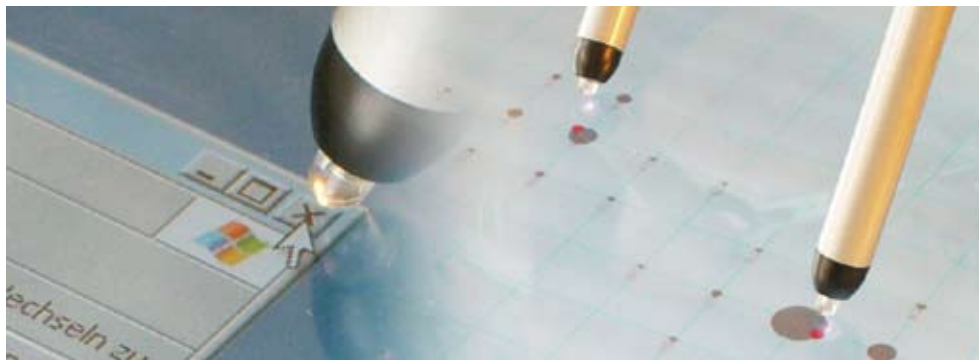
This first prototype incorporates the possibility to track up to seven different interaction devices at the same time, thus allowing several persons to interact simultaneously. The CRION prototype used back-projection for image display and infrared light for the tracking.

The current systems on the market

For a horizontal interaction space, commercially available resistive or optic overlays cannot be used anymore, because they do not support simultaneous multi-user input or because they cannot overcome occlusions occurring on the desktop. All systems have in common that they base on a back-projection, i.e. they require a certain space behind the screen for the optical path of the projector. As a result, the tables are not very ergonomic and typically the work is done in a standing position.



CRION setup: The system uses bit codes to distinguish between different devices.



Furthermore, there is a lack of intuitive user interfaces like pen, eraser, ruler, color pot, notepad, etc. that allow working on a digital basis from the very beginning. The goal of the MightyTrace project is allowing an intuitive multi-user interaction on vertical surfaces as well as on horizontal ones.

How it started

First approaches to such a multi-user interaction were already developed within a back-projection system CRION project (see

| Current MightyTrace LCD-Prototype Properties: | |
|---|--|
| LCD Size: | 20" |
| Tracking Frequency: | 180 Hz |
| # of Trackable Devices: | 6 |
| Scalability: | Up to 65" LCD |
| Material Cost: | 3000\$ per m ² interactive area |
| Size of Tracking Electronics: | 42 x 30 x 2 cm |
| Resolution: | 0.1 mm |
| Current Precision: | 3 mm |
| Hovering: | Up to 8cm above surface |

MightyTrace

MightyTrace uses a standard LC-screen, which can be equipped with the tracking technology. This does not only diminish the required space, but also results in a higher brightness of the image, allowing to work under normal office lighting conditions. This allows realizing horizontal workspaces where users can sit at in an ergonomic position.

Who is inspire / ICVR ?

inspire is an initiative of Swissmem, the Swiss Federal Institute of Technology Zurich (ETHZ), and the Federal Office of Industrial Training and Technology. The Swiss Federal Institute of Technology Zurich and the Swiss industry in the field of mechanical engineering close a gap between research and industrial implementation by establishing the competence center "inspire AG für mechatronische Produktionssysteme und Präzisionsfertigung" at ETHZ. ICVR is a subgroup of inspire and researches in the field of human computer interaction.

Contact:
ICVR
Ramon Hofer, Andreas Kunz
{hofer, kunz}@inspire.ethz.ch
Tannenstrasse 3
8092 Zurich
Switzerland