

3D-Kiosk mit berührungsloser Interaktion

3D Kiosk with Contactless Interaction

Dipl.-Ing. Klaus Hopf, Dr. René de la Barré, Dipl.-Inform. S. Renault, Dipl.-Inform. O. Stachel
Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut (HHI)
Einsteinufer 37, 10587 Berlin, Germany
Tel.: +49 (0) 30 / 310 02-0, Fax: +49 (0) 30 / 310 02-213
Internet: www.hhi.fraunhofer.de/im

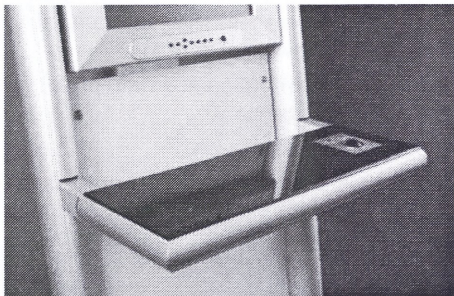
Zusammenfassung:

In enger Kooperation mit Partnern aus Industrie und Wissenschaft werden innovative Konzepte und Anwendungen für die Multimedia-Kommunikation der Zukunft erforscht und entwickelt. Ziel ist die Entwicklung von Endgeräten, Systemen und Anwendungen, die einen attraktiven und nutzerfreundlichen Zugriff zu multimedialen Daten und interaktiven Diensten ermöglichen.

Abstract:

In close collaboration with partners from science and industry the department pursues research and development of innovative concepts for multimedia communications of the future. The challenge is the design of next generation terminal interfaces, systems and applications that will allow the user an attractive and user-friendly access to multimedia data and interactive services.

1. The Fraunhofer 3D Kiosk



Kiosk systems must stand out by offering simple intuitive handling and eye-catching design. The Free2C 3D kiosk presents any kind of interactive content as virtual objects on a large scale display in photorealistic 3D quality. The user does not need 3D glasses to view the content. A system which recognizes gestures is integrated into the front panel so that viewed 3D objects floating in front of the display can be rotated by using gestures, and virtual buttons can be pressed simply by pointing at them (virtual 3D touch screen).

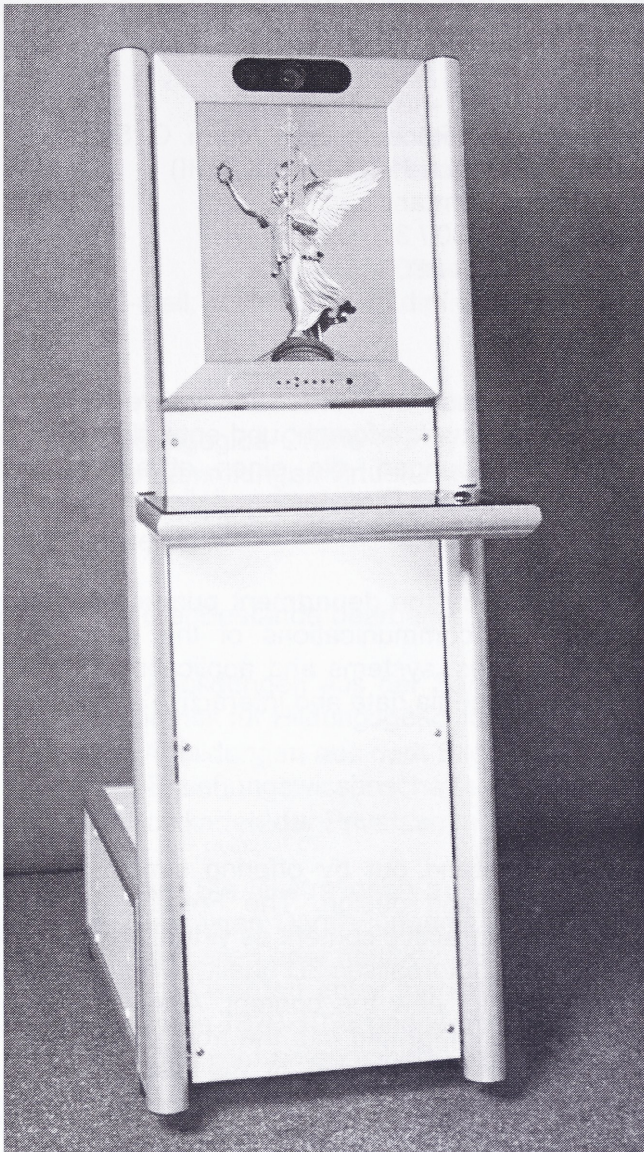
3D Display Characteristics

- No stereo viewing glasses needed
- Free positioning of a single viewer within an opening angle of about 60 degrees
- Excellent stereo separation (extremely low crosstalk)
- Very high spatial resolution (1200 x 1600)
- Excellent brightness and color reproduction

Typical Applications

- Appealing presentations in kiosk environments (trade shows, museums, etc.)
- Medical science (endoscopy and minimal invasive surgery)
- Design and engineering (CAD, virtual prototyping)
- Architecture (simulation und visualization of planned buildings)
- Education and simulations (driving/flight simulator, training of complex operations)
- Exploration or inaccessible environments (archeology, oceanography)
- Entertainment (3DTV, PC games)

2. Specifications



Basic display

Display diagonal	21.3" / 54.1 cm
TFT technology	SuperFine TFT
Usable display size (portrait format)	324 × 432 mm
Number of pixels (H × V)	UXGA, 1200 × 1600 (xRGB)
Pixel pitch	0.27 × 0.27 mm
Number of colours	16.77 M
Video interface	analog VGA d-sub

3D display

Type	Lenticular display (autostereoscopic)
3D resolution (H×V)	(2× 600) × 1600 (xRGB)
Picture format	4:3 portrait format
Brightness	> 200 cd/m ²
Contrast ratio	> 300:1
Stereo crosstalk	typically less than 2%
Nominal viewing distance	700 mm
Head tracked viewing zone (sweet spot)	frontal: 450 mm - 1100 mm lateral: 650 mm (at nominal viewing distance)
Stereo multiplexing scheme	left/right on alternate pixel columns
Lenticular lensplate	high-quality acrylic-on-glass technology; vertically oriented and integrated in the display's front side; adjustable with regard to the LCD panel

Windows XP high-end PC

Hyper threading workstation PC with:
 additional SXGA LCD monitor,
 MSI FX 59000 GeForceXT dual-head VGA card,
 FALCONquattro video grabber,
 HHI Video head and hand tracker software installed,
 HHI Workbench^{3D} software installed

High-speed video Head tracking

50 - 120 Hz update rate,
 dual-axis voice-coil tracking system (lateral and frontal directions),
 infrared illumination (LEDs, optionally switchable) for low ambient-light conditions

Video Hand tracking

50 - 60 Hz update rate,
 infrared illumination,
 tracking range: 40 cm x 50 cm at 50 cm distance