IFA 125 Jahre
Institut für Arbeitsschutz der
Deutschen Gesetzlichen Unfallversicherung

Virtual environments

for research into occupational safety and health

Michael Huelke, Peter Nickel, Andy Lungfiel, Georg Nischalke-Fehn, Michael Schaefer

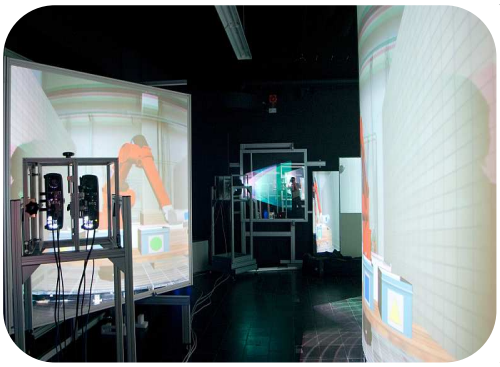
Virtual Reality is used for human-machine interface design and evaluation of products and processes which are

- not yet available, because still under development
- already available, for usability and safety concept improvements
- no more available, for cause-effect accident analysis
- even if potentially dangerous, they will cause no harm but realistically affect human-machine interaction

VR is human-machine interaction:

Close to reality in 3D-simulated real/future work environments

- curved presentation wall of 24 m²
- 3D rear projection using Infitec®; 3 pairs of projectors
- edge-blending, static and dynamic warping (VIOSO®)
- motion capturing for dynamic adaptation of vision (VICON®)
- Dolby® Digital 5.1 audio projection
- mobile, head-mounted eye and gaze tracker (iVIEW®)
- human performance assessment



Safety and Usability through Applications

- Human-Robot interaction in reality and virtual reality – validation study
- Suitability of requirements for 2D electro-sensitive protective equipment for 3D safety devices
- Cognitive-ergonomic safety requirements for workplaces with collaborating robots
- Usability of control panels of areal work platforms
- Empirical estimation of hand/arm/approach speeds for evaluation of human distances to potential danger zones