Bern University
of Applied Sciences

Research Group HuCE – cpvrLab

Competences

The Computer Perception and Virtual Reality research lab (HuCE – cpvrLab) focuses its research on the analysis of image and video signals, haptic feedback as well as the visualization and user-friendly interaction with three-dimensional data. Using state-of-the-art input devices and visualization techniques, complex data can be processed in a novel way and made accessible intuitively. Problems of particular interest of our research and development activities are in the area of medical image analysis and processing, optical coherence tomography and optical tracking. Virtual Reality focuses on haptics, multimodal interaction techniques and interaction in virtual environments. In the area of biometrics, we focus on the development of authentication algorithms based on fingerprints, signature and iris scans. Current research and development projects are being undertaken in the scope of computer-aided diagnosis, computer-assisted surgery, preoperative planning and optimization problems.

Key Projects

The following research (Commission for Technology and Innovation CTI) and industrial projects give an overview of the research activities of our group:

- MOTASSO: Motillity assessment software
- Galilei Dual Scheimpflug analyzer
- Evaluation of ultrasound contrast agents
- Simulation of pulmonary embolism for CT angiography at reduced radiation exposures
- HOVISSE: Haptic osteosynthesis virtual intra-operative surgery support environment
- Operation room interactive surgery workflow simulation
- 3D-OCT data processing/visualization
- HORUS: Stereoscopic visualization of medical volume data sets

Infrastructure

The modern infrastructure of the HuCE-cpvrLab includes a 4-wall CAVE laboratory equipped for life size 3D stereoscopic visualization and haptic feed-back. Several stereoscopic 3D stereo workstations, modern cameras for different modalities and a haptics lab for 20 students provide a flexible infrastructure for development projects. Our broad experience in state-of-the-art software packages and libraries developed in our lab allow competent and effective solutions.

Our flexible collaboration model for services and R&D projects allows us to start industrial projects within a short time.

Contact

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