

Computer Graphics and Virtual Reality University of Bremen



Virtual Reality

- Fully immersive virtual environments
- Intuitive 3D interaction metaphors
- Massively threaded VR systems



Geometric Algorithms & Data Structures

- Fast space-filling sphere packings
- Real-time collision detection, proximity computation, and collision avoidance
- Acceleration data structures



Spacecraft Simulation in VR

- World simulation (celestial bodies, gravitation, solar pressure, etc.)
- Realistic synthesis of artificial sensor data
- Procedural 3D modeling on GPUs





Real-Time Hand Tracking

- Full 26 DOF hand pose estimation
- Advanced Random Forest machine learning, featuring infinite data base training





Haptic & Force Feedback

- 6 DOF bi-manual multi user haptic rendering
- Stable 1000 Hz simulation rate by our novel Inner Sphere Trees



Point Cloud Processing

- 3D reconstruction of smooth surfaces
- Online hybrid CAD/point cloud proximity computations



