Bachelor Thesis/Semester Thesis
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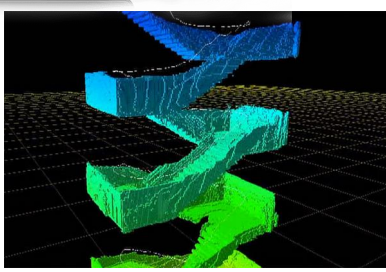
IWF
Institut für Werkzeugmaschinen und Fertigung
Institute of Machine Tools and Manufacturing

Scanning of Real Scenes and Objects for Generating 'Walkable' Virtual Environments

Keywords: virtual reality, 3D scanning, mesh generation, texturing

Overview



Thanks to recent virtual reality (VR) hardware, VR is starting to conquer the consumer market and many real life applications are emerging.

However, connecting the real world with virtual worlds - e.g. for virtual visits of remote places - is still a big challenge. It requires modeling existing real world objects for rendering them in a virtual scene. This process is costly and time-consuming.

Therefore, this thesis is about how scanning of scenes and objects can be done with hardware devices such that the resulting models can be used right away in virtual environments for efficient real-time rendering.

Task

- Analyze current state of the art of how scenes can be scanned (hardware & software)
- Analyze what post-processing software exits for generating a useful (suitable for real-time navigation) virtual scene from a model
- Check and compare the quality of the models for different methods
- Evaluate real-time (e.g. Tango device) processing and post-processing methods
- Really scan a defined environment
- Improve the resulting model in a post-processing step
- Load the scene in a game engine (Unity3D) and make it walkable with the ReWaVE simulator

Requirements

- Some programming skills
- Motivated and autonomous work style
- Capability to do a thorough literature study
- Ability to get in contact and talk to various people from the research domain
- This work will be 50% literature research and 50% testing and implementation
- The results of this thesis have to be summarized in a written report and will be presented to the ICVR group in a 20 min talk.

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