A software tool recently developed at the CV&RS group of TU-Berlin, allows the synthetic generation of realistic benchmarks for 3D reconstruction from images. Scenes composed from publicly available photo-realistic models are extended by realistic effects of the image formation process of digital cameras. This approach not only allows to retrieve actual ground truth data. It also gives full control of all scene properties, including, but not restricted to, internal and external camera parameters, the light situation, object motion, and surface properties.

The goal of this thesis is on the one hand to extend this framework by including more models, composing new scenes with existing models, and generate new image sets based on different parameters. On the other hand, the resulting benchmark datasets shall be used to evaluate existing 3D reconstruction pipelines with respect to accuracy, robustness, and computational load.

**Keywords:** 3D reconstruction, structure-from-motion, rendering

**Involved tasks:**
- Search and test of new digital 3D models allowing for photo-realistic rendering
- Generation of benchmark datasets focussing on specific camera or scene properties
- Evaluation of existing software for 3D reconstruction

**Recommended requirements:**
- Basic knowledge about computer graphic
- Basic knowledge about photogrammetric computer vision (e.g. attendance in PCV)

**Language:** German / English