Detection and Reconstruction of Transparent or Specular Surfaces

Standard Structure from Motion (SfM) approaches work very well if the image acquisition circumstances are optimal and if the reconstructed objects match the assumed reflectance model. Reflecting and transparent surfaces on the other side are a big challenge for these algorithms. Often they are ignored as outliers and later extrapolated by the local neighborhood.

The goal of this work is to detect object parts, that do not correspond to the standard reflectance model and to reconstruct them independently by different approaches than the rest of the object.

Keywords: 3D reconstruction, Lambertian reflectance model, specular reflection

Involved tasks:
– Literature research
– Implementation of a SfM method for 3D reconstruction of reflective or transparent surfaces
– Evaluation of the whole framework

(Recommended) requirements:
– Good knowledge about image processing (eg. attendance in Digital Image Processing)
– Good knowledge about 3D reconstruction (eg. attendance in Photogrammetric Computer Vision)
– Good programming skills (e.g. C/C++)

Language: German / English