A variational study on BRDF reconstruction in a structured light scanner

Time-efficient acquisition of reflectance behavior together with surface geometry is a challenging problem. In this study, we investigate the impact of system parameter uncertainties when incorporating a data-driven BRDF reconstruction approach into the standard pipeline of a structured light scanning system. The parameters investigated include geometric detail of scanned objects; vertex positions and normals; and position and intensity of light sources. To have full control of uncertainties, experiments are carried out in a simulated environment, mimicking an actual structured light scanning setup. Results show that while uncertainties in vertex positions and normals have a high impact on the quality of reconstructed BRDFs, object geometry and light source properties have very little influence on the reconstructed BRDFs. With this analysis, practitioners now have insight in the tolerances required for accurate BRDF acquisition to work.

General information
Publication status: Published
Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics
Number of pages: 10
Pages: 143-152
Publication date: 2017

Host publication information
Title of host publication: Proceedings of International Conference on Computer Vision (ICCV 2017)
Publisher: IEEE
Electronic versions: slbrdf.pdf
DOIs: 10.1109/ICCVW.2017.25
Source: PublicationPreSubmission
Source ID: 140683503
Research output: Chapter in Book/Report/Conference proceeding → Article in proceedings – Annual report year: 2017 → Research → peer-review