

Iterative geometry adaptation of a reference geometry using triangulated features

As part of a research project, a measurement setup for quantifying the wear condition of complex free-form surfaces based on image data is being developed. In order to avoid a 3D-reconstruction of the measurement object, the obtained image data is merged with a 3D reference model.

In this work, the existing data registration is to be improved by adapting a reference geometry on the basis of triangulated feature points. The first step is to preselect the points. Suitable optimization variables and constraints are then determined. These variables and constraints serve as the basis for the iterative adaptation of the mesh.

The aim of this work is the theoretical development of a method for geometry adaptation, as well as the subsequent implementation in the existing data processing structure. Validation is to be carried out using existing reference measurements.

Keywords: computer vision, point cloud modification, computational geometry, object modeling

Your tasks:

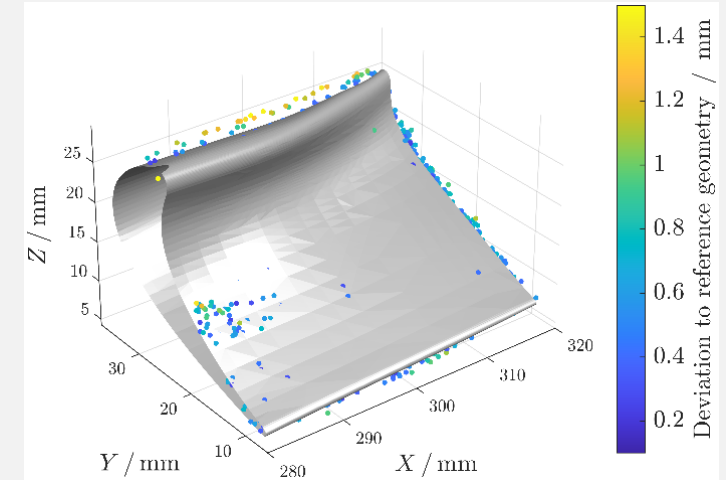
- Literature research on current approaches/publications
- Implementation of algorithms for geometry adaption
- Validation of the results using reference measurements
- Evaluation and documentation of the results

Your profile:

- Experience with Python
- Interest in industrial imaging
- Ability to work independently

We offer:

- Excellent academic support
- Motivated team
- Flexible working hours
- Exciting research projects



Deviation between reference geometry and measurement data

Adrian Kaune, M.Sc

adrian.kaune@imr.uni-hannover.de

