TECHNISCHE UNIVERSITÄT CHEMNITZ

Fakultät Maschinenbau
Institut für Werkzeugmaschinen und Produktionsprozesse
Professur Fertigungsmesstechnik

TOPIC FOR A STUDENT RESEARCH PROJECT, BACHELOR OR MASTER THESIS

INFLUENCE OF CAD FORMAT CONVERSION ON THE GEOMETRICAL DATA QUALITY OF MODELS FOR ADDITIVE MANUFACTURING

3D printing is a technology that can be used in many ways and its application now extends far beyond prototyping. A defining phase in the manufacturing process is the conversion of CAD models into a format that can be processed by slicer software. This conversion can have a significant impact on the geometrical characteristics of the components, which in turn can affect the quality and functionality of the manufactured parts.

The influence of converting a complex CAD model into different formats suitable for slicer software is to be investigated, in particular how the geometric properties of the ideal geometrical features change during the conversion process.

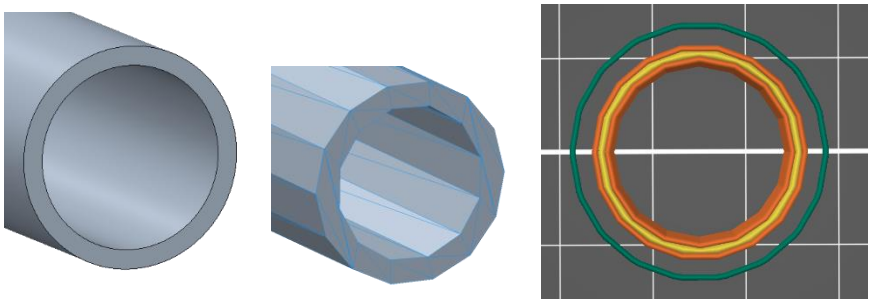

Fig 1.: Ideal geometrical feature (left), converted geometrical feature (centre), slicing process (right)

TASKS:

- Comprehensive research into the common CAD file formats (e.g. STL, OBJ, 3MF) used in additive manufacturing
- Comparison of the various file formats in terms of their effect on geometric deviations of the ideal geometry element, file size, compatibility with slicer software and other relevant criteria
- Analysing the geometrical characteristics of a model with selected file formats
- Identification of relevant geometrical features and determination of the associated design parameters (e. g. angles and radii)
- Evaluation and presentation of the results
- Summary of the work and outlook for further work

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