



M.Sc. Topic:

“From Cloud to Clarity: Optimizing Parameter Extraction with CloudCompare to Unlock Model Potential”

Background:

Terrestrial laser scanning (TLS) is an advanced measurement technique used in both field and laboratory settings within the field of environmental engineering. It captures highly detailed 3D information of landscapes and objects, creating what is known as 3D point clouds. These datasets facilitate creating precise topographic maps and conducting spatial analyses.

In processing 3D point clouds, a multitude of tools and methods are available. However, for the purpose of this thesis, the open-source software CloudCompare will be the primary tool of choice. This software offers various capabilities for extracting specific parameters from acquired 3D point cloud data.

To explore the possibilities of CloudCompare in accurately extracting essential topographic parameters, five test datasets were curated from laboratory TLS measurements conducted within a hydro-morphological river model. The main objective of this thesis is to design and try parameter extraction methods and workflows for the test datasets. For validation of the extracted parameters, a comparison of different workflows and the precise tracking of changes in the parameters across the five test datasets is crucial. Through these efforts, we aim to gain insights into the evolving patterns and trends of the river model's morphodynamics.

Thesis Overview:

1. Review literature on TLS and point cloud processing in the context of parameters influencing fluvial bed forms.
2. Familiarize with CloudCompare.
3. Design and try parameter extraction workflows.
4. Evaluate workflow results by analyzing trends.
5. Give recommendations for parameter extraction with CloudCompare.



Apply now!

teresa.schnellbach@iws.uni-stuttgart.de

This thesis can be written in English or German.

Examiner: PD Dr. Stefan Haun (LWW)

Supervisor: Teresa Schnellbach, M. Sc. (LWW)

**M.Sc.
Thesis**

