Bachelor and Master Theses in Geoinformation
Artificial intelligence for the analysis of geoinformation

This topic cluster deals with the modeling and analysis of geoinformation (e.g. trajectories, building models or point clouds) based on both raster (e.g. images) and vector data (e.g. building floor plans). An automatic interpretation is targeted for the (1) reconstruction of semantically detailed urban structures and (2) the pattern recognition from the underlying data. In the context of a bachelor or master thesis in the geoinformation working group novel ideas and methods are developed for these purposes.

Typical Content and Tasks

A thesis in this area may address the following topics:

- Machine learning (including deep learning and clustering)
- Pattern recognition
- Reasoning

Application areas include but are not limited to:

- Facade, roof, and indoor models
- Automatic data integration
- Trajectory analysis and transportation

A typical thesis will include a literature review, problem specification, selection of methodology, implementation, and experimental evaluation on real-world data.

Figure 1: Three examples for AI applied in geoinformation, left: Classification and reconstruction of roof models from 3D point clouds. Middle: Reasoning for automatic estimation and detection of invisible electrical wires in the wall. Right: Improving vehicle trajectories using 3D city models.

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