Chair of Computational Modeling and Simulation
Department of Geo, Civil and Environmental Engineering
Technical University of Munich

Modeling: ★★★☆☆
Mathematics: ★☆☆☆☆
Programming: ★★★★☆
Science: ★★☆☆☆

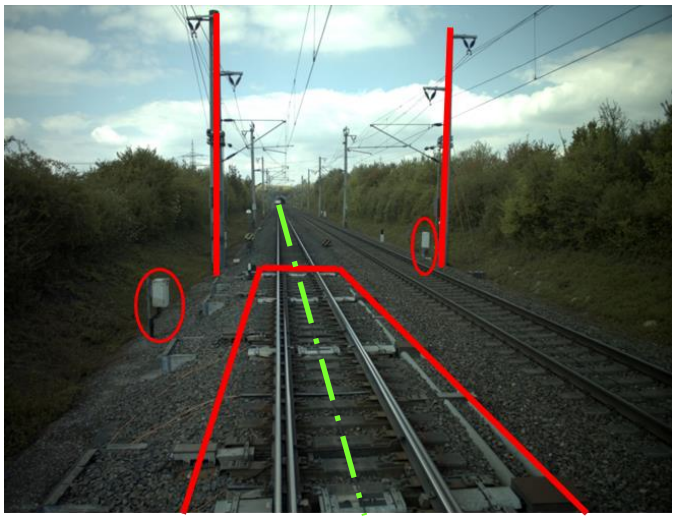
Software Lab

in cooperation with Obermeyer Planen+Beraten GmbH

(Semi-) Automatic Recognition of Infrastructure Objects in a Point Cloud

Setting

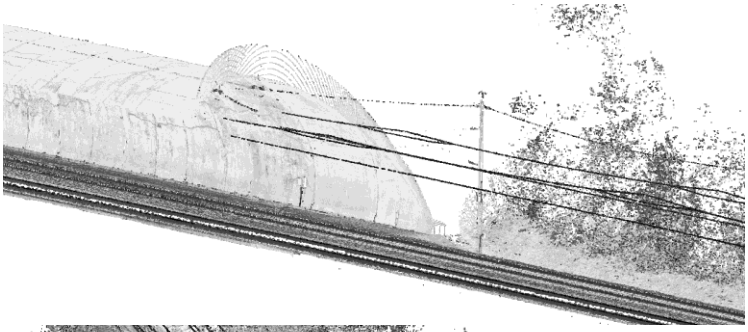
When renewing or expanding existing infrastructure assets, the current state is needed as the basis for design. The data can be acquired in a point cloud which then needs to be processed. However, this demands a lot of hours of manual labor.

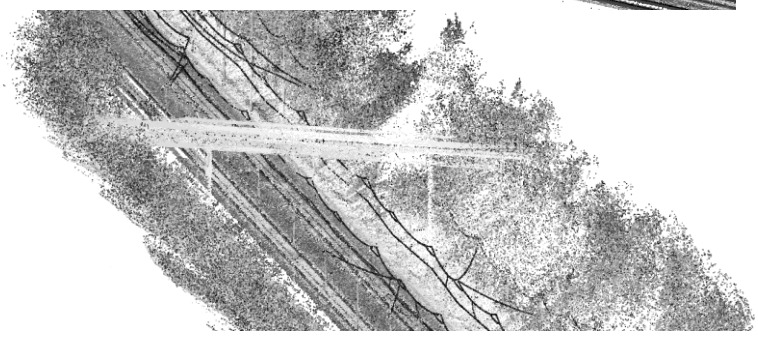


In infrastructure domain, individual objects come at regular intervals along the centreline which implies that automatic recognition could be feasible. These repetitive objects may be masts, cable ducts, drainage manholes, and many others. Additionally, there are distinct objects like switches that could also be derived from a point cloud.

Task

Given are a point cloud (figure mid and bottom) and the main centreline (the green line on figure top) of the infrastructure asset.





Create a C++ based application:

- Implement and test (semi-) automatic algorithms to extract the objects. These may be reverse engineering or artificial intelligence procedures.
- Recognize individual objects (like masts) and linear objects (like noise barrier).
- Output their location, size, orientation, and semantic meaning.
- Bonus: go for engineering structures (like tunnels and bridges).

Supervisors

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