

BIM in Conventional Tunnelling – What to map and record at the Advancing Tunnel Face

**Institute of Rock Mechanics and Tunnelling
Graz University of Technology**

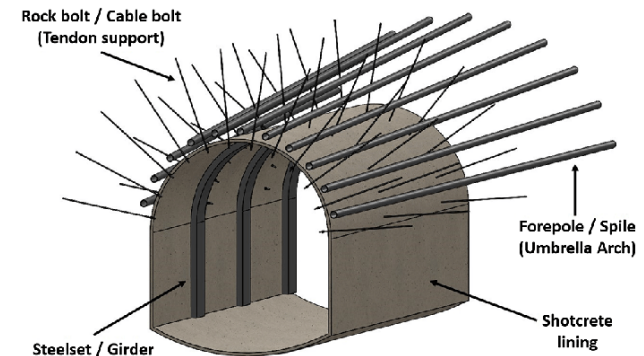
Thomas Geisler
17.10.2019

What is it about?

- Digitalisation in tunnelling is a very important and upcoming part in the field tunnelling
- Lots of different features are recorded
 - Geology
 - Overbreaks, discontinuities, etc.
 - 3D-model of tunnel face
 - Rock supporting tools
 - Rock bolts
 - Piles
 - Lattice girders
 - Shotcrete (thickness)
- Digitalisation of these features
 - Photogrammetry
 - Laserscan data
- Digital model of the rock face including geology and rock mass support with the exact positions and dimensions



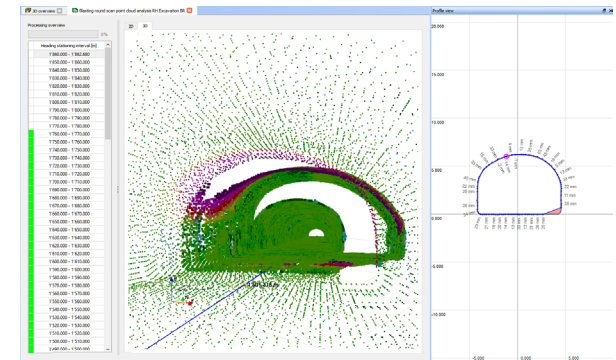
Tunnel Schaal, tunnel face



Examples of rock support

Tasks

- Literature study “State of art methods in digital tunnel face documentation using photogrammetry/laserscan and the resulting point clouds”
- Extraction of important information regarding object and position detection using 3D point clouds
- Data acquisition and analysis
 - Evaluation/ improvement of existing models
 - Implantation of Machine learning Algorithms
 - Testing of models



Example of digital tunnel model



Preliminary- and final presentation and written report (master thesis) answering the question “**What are the key parameters in the field of digital tunnel face documentation (3D point clouds) to detect the different geological and rock supporting features on a high resolution?**”

Hard Facts:

■ Requirements:

- Passion for computer work
- Interest in digital modelling
- (Experience in remote sensing technologies)

■ Supervision:

- Thomas Marcher *Graz University of Technology*
- Thomas Geisler *Graz University of Technology*
- Geodata
Ziviltechnikergesellschaft m.b.H. *Leoben*



- Start: Immediately / by agreement for a duration of approx. 6 months

- Contact: Thomas Geisler
geisler@tugraz.at
+43 (0) 316/ 873 8615