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

# **Master Thesis** (MT, 30ECTS)

**Working Title** Information extraction from excavation logs data

**Description**

Data extracted from the tunnel drilling data logs can be successfully used for the decision support and process optimization. The processed log data can be analysed to identify trends and clusters, that can be associated with different strategies for construction (e.g., to define the shotcrete volume, optimize a drilling plan, etc.). An association of identified patterns with the characteristics of reference tunnel section (observed on-site conditions) can be made using various machine learning approaches.

This work's focus is to explore supervised and unsupervised machine learning techniques and identify winning approaches for linking the information extracted from the log data with the geological conditions.

The literature review shall be conducted to identify a state-of-the art methods proposed for geological conditions' prediction from the drilling data. Five to ten approaches based on supervised and unsupervised machine learning methods shall be selected and tested on the existing log data for predicting the characteristics of the reference tunnel section.

The output of this work will be a report on methods accuracy and applicability, broken down to the methods specificity and sensitivity for predicting the selected features (like rock mass strength, mean tunnel displacement level, other indices).

It is desired that a candidate would have prior knowledge about machine learning and Python programming.

| Contact Person (s) | Start | Duration | Contact |
|---|---|---|---|
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