



Master thesis (30 ECTS)

Working Title

ML based anomaly detection in TBM datasets

Project objectives

Machine learning has made a huge impact on the domain of anomaly detection, based on forms of automatic pattern learning algorithms. One popular approach focuses on reconstruction methods. The underlying idea assumes that if a model can learn a function that compresses and reconstructs normal data, then it will fail to do so when encountered with anomalous data because its function was only trained on normal data. Variational autoencoders (VAE) have shown good results for this task using tabular/time-series datasets.

The idea of this thesis is to dig into the topic of VAEs and anomaly detection, to research what has been done and ultimately to deploy a VAE on TBM operational data with the task to classify it as anomalous or not. With this approach it could be possible to detect anomalies (e.g., fault zones) in the TBM data. Once this works out, further investigations could be made if it would be possible to detect anomalies in an early stage, and therefore make it possible to counteract before a peak event is reached.

Student has enthusiasm for

machine learning applications for geotechnical purposes, geotechnical data, programming, anomaly detection

Start

July 2022

Project term (min. / max.)

6 / 9 months

Coop. with external institution

no

Possibility of remuneration

no

Contact person(s)

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