Graz University of Technology
Institute of Rock Mechanics and Tunnelling

Master's Project (MP, 5 ECTS)

Mining Exploration Data as a Prediction Tool and real-time Update of the Geotechnical Prognosis in continuous tunnelling

During TBM driven tunnels, lots of data is generated, including penetration depth, thrust force etc. in order to control the advance rates of the TBM. In addition, geophysical and drilling programs are conducted to explore the rock mass ahead. This effort is done, because the actual tunnel face is more or less oblique to the geologists and geotechnical engineers.

However, since lots of data is at hand, data mining (DM) with machine learning (ML) algorithms might also provide the possibility to predict the geological conditions ahead of the excavation.

This project aims at a preliminary study whether DM is applicable on the generated data or to which extend the data has to be modified, weighted, or supplemented by other input sources. The elaboration follows the steps below:

- Which data is generated and recorded during exploration programs in continuous tunnelling?
- How can this data be digitalized/classified?
- Which additional data is at hand which might improve the ML results?

This project is the basis for a consecutive Master's thesis, which shall lead to a method to apply ML on TBM driven tunnelling for a real time update of an existing prognosis model by using machine data and exploration measures (geophysics, drilling).

Templates for the scientific report can be found on the institute's homepage. There is also a guideline for scientific writing free downloadable at the homepage, whose compliance is mandatory. The language for the report can either be in English or in German.

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