



INSTITUTE OF ROCK MECHANICS AND TUNNELLING

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FACT SHEET to the research project MLGT

SHORT TITLE / ACRONYM

MLGT

LONG TITLE

Machine Learning in Geotechnics

DESCRIPTION

Today's construction sites and scientific research projects usually involve the collection of tremendous amounts of data. Whether this data is collected for documentation purposes or generated as a byproduct of the construction process, it hardly ever is utilized to its full extent.

Machine learning is the application and science of algorithms that make sense of data (Raschka, 2017) and has the direct goal to extract meaningful information from big datasets. To use these techniques the Institute of Rock Mechanics and Tunnelling has established a special research group called Machine Learning in Geotechnics (MLGT). First studies of MLGT comprise deploying machine learning algorithms (e.g. Artificial Neural Networks) on tunnel boring machine operational data from Austrian construction sites. The goal of these algorithms is typically the classification or prediction of the data in a supervised manner and first results look promising.

PROJECT COORDINATOR

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RELATED MASTER'S THESES

YEAR	AUTHOR	WORKING TITLE
2019	Geisler	Tunnel Boring Machine data analysis with respect to the geotechnical conditions
2019	Heikal	Finding Structure in Data - Analysis of TBM advance data <i>still in progress</i>

RELATED PUBLICATIONS

YEAR	AUTHOR(S)	PUBLICATION TITLE
2019	Erharter, Marcher & Reinhold	Application of artificial neural networks for Underground construction – Chances and challenges – Insights from the BBT exploratory tunnel Ahrental Pfons
2019	Erharter, Marcher, Reinhold	Artificial Neural Network Based Online Rockmass Behavior Classification of TBM Data
2019	Erharter, Marcher, Reinhold	Comparison of artificial neural networks for TBM data classification

RELATED THIRD-PARTY FUNDED PROJECTS

YEAR	PROJECT DESCRIPTION	INFORMATION TO FUNDER(S), FUNDING PROGRAM(S) AND CO-OPERATION PARTNER(S)
2019	MaLMoCT.1: Applicability of Machine Learning methods to geotechnical monitoring data in conventional tunneling projects	<ul style="list-style-type: none"> • Funder: FFG - The Austrian Research Promotion Agency • Funding program: Innovation Voucher (De-minimis-grant) • Co-operation partner: Geodata Informationstechnologie GmbH
2019	Big Tunnels - Big Data: AI based rock mass classification in tunnelling	<ul style="list-style-type: none"> • Funder: FFG - The Austrian Research Promotion Agency • Funding program: Innovation Voucher (De-minimis-grant) • Co-operation partner: geo.zt gmbh - poscher beratende geologen