Special Issue

Intelligent Prediction and Performance Optimization for Deep Underground Resource Excavation Process

Message from the Guest Editors

Specific research areas include, but are not limited to, the following:

- Study of macro- and micro-scale fracture and damage characteristics of rocks under cyclic dynamic loading conditions.
- Investigation of macro- and micro-scale fracture and damage characteristics of cutting tools and metallic materials under cyclic dynamic loading conditions.
- Analysis of cutting force, surface temperature, surface stress/strain distribution, and wear characteristics during the interaction between cutting tools and rocks.
- Development of interaction mapping models between cutting parameters of heavy rock tunneling machine tools and the dynamic physical and mechanical properties of rocks.
- Numerical simulation and optimization of cutting parameters during coal and rock tunneling processes.
- Dynamics analysis and optimization techniques for tunneling machine cutting tools.
- Modeling studies on the impact fracture and damage of rocks and metallic materials.
- Intelligent monitoring and prediction of tool wear states based on deep learning.
- Adaptive optimization systems for cutting parameters of tunneling machines based on reinforcement learning.

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