Special Issue

Advances in Artificial Intelligence for Geotechnical Engineering

Message from the Guest Editors

The rapid advancement of artificial intelligence (AI) and machine learning technologies has opened new frontiers across many branches of engineering, including geotechnical engineering. As geotechnical systems often involve complex, nonlinear, and spatially variable conditions, traditional modelling approaches can be limited in their capacity to handle uncertainty, heterogeneity, and large datasets. AI-based approaches provide promising alternatives that can enhance predictive capabilities, improve design efficiency, and enable real-time decision-making in geotechnical engineering practice. This Special Issue highlights AI advancements in geotechnics, fostering collaboration and innovation. Topics include:

- AI-driven modelling of soil behaviour and geotechnical parameters
- Machine learning and deep learning applications in site characterization
- Surrogate models for geotechnical simulations
- Symbolic and interpretable AI
- AI in risk assessment (landslides, foundations, etc.)
- Sensor data integration for real-time monitoring
- AI-based seismic response prediction
- AI-based optimization in geotechnical design and decision-making
- Case studies on AI applications in geotechnics

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