

MACHINE LEARNING IN COMPUTATIONAL MECHANICS AND EARTHQUAKE ENGINEERING

600 - DATA SCIENCE, MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

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ABSTRACT

In the face of increasingly complex natural disasters, particularly the severe challenges posed by earthquakes, the development of Machine Learning (ML) has opened new avenues for enhancing the resilience and safety of urban structures. This mini-symposium aims to bring together researchers and engineers to discuss Machine Learning's latest applications and advancements in Computational Mechanics and Earthquake Engineering.

We cordially welcome contributions on the following topics: machine learning-based structural damage diagnosis and prediction, intelligent structural analysis and design optimization, earthquake early warning and rapid response systems, as well as AI applications in building resilience assessment, smart retrofitting and strengthening techniques for existing structures, disaster response and recovery planning for buildings, intelligent and adaptive building systems, and AI-enhanced hazard modeling and impact assessment.

Contributions may explore a wide range of techniques, including but not limited to deep learning, reinforcement learning, data-driven models, neural networks, probabilistic inference, optimization algorithms, intelligent structural health monitoring, and hybrid applications of AI with traditional computational mechanics models. The focus is on applying these advanced AI methods to significantly improve the safety and performance of urban structures under various disruptive conditions, such as earthquakes. This symposium seeks to foster in-depth exchange and collaboration among specialists in Machine Learning, Computational Mechanics, and Earthquake Engineering. We encourage the development of integrated and cutting-edge AI solutions to mitigate seismic risks and comprehensively enhance overall urban resilience effectively. By sharing knowledge and innovations, we strive to contribute to developing safer and more reliable urban infrastructure.