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Machine Learning Applications for Engineered Geomaterials Development

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Message from the Guest Editors

Geomaterials are materials that are influenced by geological systems and that have served humankind for multiple centuries. Recent urbanisation and unprecedented usage have put pressure on these materials and has caused rapid depletion. Newly developed multiphase/scale analysis methods should improve our understanding of geomaterial behaviour. If a clear understanding can be achieved, it could greatly benefit the safety and reliability of geotechnical infrastructures built on/with geomaterials. All structural applications now produce huge loads both directly and indirectly, which removes the need for generic geomaterials, and hence, a newer dimension has come into use, which is engineered geomaterials.

Engineered geomaterials are used in a wide range of applications including structures under severe environments. The application of AI and ML is steadily growing due to their versatility and application standards. Material design requires many resources in analysing and understanding a material's behaviour, which is currently widely supported by machine learning applications.

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Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

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