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Special Issue Reprint

Characterization, Applications and New Technologies of Civil Engineering Materials and Structures

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With the continuous development of large-scale maintenance of infrastructure, accurate, reasonable, and efficient mechanical behavior evaluation and performance prediction of civil materials and structures have become the keys to improving service durability and intelligent maintenance management for infrastructure. The multi-component composition, multi-scale characteristics, and multi-field dependence of civil materials lead to extremely complex mechanical behaviors. The phenomenological method based on empirical tests is an important means to understand and evaluate civil materials, but its low efficiency and high consumption cannot meet the design and application requirements of civil materials. Numerical simulation has gradually become an important tool to study and understand the mechanical behavior of civil materials and structures, including the finite element method, discrete element method, molecular dynamics simulation, etc. In addition, the rapid development of numerical simulations has greatly promoted the modeling and simulation of civil materials. Considering the above, the aim of this Special Issue is to bring together cutting-edge research and application. To share, present, and discuss innovative materials, structures, and characterization methods may help us further develop the technology used in civil engineering.

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