

Special Issue

Application of Symmetry in Civil Infrastructure Asset Management

Message from the Guest Editors

Civil infrastructure asset management involves the systematic planning, maintenance, and optimization of physical assets to ensure their longevity and efficiency. Symmetry/asymmetry plays a crucial role in various aspects of infrastructure management, from structural health monitoring to deterioration modelling and maintenance optimization. The presence of symmetry in asset conditions, degradation patterns, and decision-making processes can significantly improve computational efficiency, enhance predictive modelling accuracy, and optimize resource allocation. Conversely, understanding asymmetry can help address uncertainties and variabilities in asset performance, leading to more robust management strategies. The aim of this Special Issue is to explore the applications of symmetry/asymmetry in infrastructure asset management, which can be highly beneficial for engineering, data-driven decision-making, and policy optimization. For instance, symmetry-based modelling approaches can improve the efficiency of maintenance scheduling, while recognizing asymmetry in degradation patterns can lead to more adaptive and cost-effective asset management strategies.

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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

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