Special Issue

Symmetry/Asymmetry in Applied Machine Learning and Neural Networks for Hybrid Energy Ship Power System

Message from the Guest Editors

As the main carrier of maritime transportation and trade, more than 90% of traditional ships' main propulsion power units are currently diesel engines that burn heavy oil. The single energy structure of a traditional ship system results in a large amount of greenhouse gases during navigation, which cannot achieve efficient energy utilization. To achieve the global greenhouse gas emission reduction strategy, new energy technologies such as wind energy, solar energy, and fuel cells have been widely applied in new energy ships. However, the intermittent, fluctuating, and uncertain characteristics of new energy power generation devices, as well as the voltage and frequency fluctuations of ship power grids under different operating conditions, have caused difficulties in characterizing the dynamic model of large-scale ship energy power systems as well as coordinating the output of multiple energy sources under different sea conditions. In combination with increasingly mature AI technology, solving the collaborative optimization and control problems of ship energy power systems under dual carbon constraints is critical to ensure the stable operation of ships.

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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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