Special Issue

Intelligent and Sustainable Welding: State of the Art, Challenges and Prospects

Message from the Guest Editors

Intelligent and sustainable welding technology integrates modern control theory, artificial intelligence, material science, and environmental science to enhance efficiency, accuracy, and environmental protection in welding processes. It employs advanced technologies like robotics, AI, and machine learning while focusing on sustainability by reducing energy consumption, waste, and emissions. This Special Issue seeks research on intelligent welding systems (e.g., power supplies, robotic and control systems), multi-information fusion sensing technologies (visual, acoustic, electrical, spectral, optical, infrared, etc.), advanced welding quality control algorithms (weld seam tracking, in-process quality monitoring, defect detection, etc.), teaching-free programming technologies (offline programming, adaptive path planning, online parameter adjustment), welding IoT, green welding methods, and welding consumables. Additionally, reviews and papers on new processing technologies for manufacturing metallic materials are welcome.

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Message from the Editor-in-Chief

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

Editor-in-Chief

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