Special Issue

Toward Persistent Space Presence: Advances in Artificial Intelligence and Soft Robotics for Adaptive and Perceptive Space Robotics

Message from the Guest Editors

Space robotics has rapidly advanced from supporting narrowly defined missions to enabling long-term autonomous operations in orbital, planetary, and deep-space environments. As future missions move toward persistent space presence, robots must not only execute pre-programmed routines but also adapt, learn, and collaborate under uncertain and dynamic conditions. Recent advances in Artificial Intelligence (AI) and soft robotics are reshaping the future of autonomous systems in space. AI enables robots to achieve self-awareness of their morphology, perform goal-directed planning, reason under uncertainty, and adapt to harsh and evolving environments. Complementarily, soft robotic designs provide robustness, compliance, and safety when interacting with unstructured or unpredictable surroundings. Together, these technologies pave the way toward scalable, fault-tolerant, and self-adaptive robotic systems capable of sustained operations in extreme outer space conditions. This Special Issue aims to at bringing together contributions that explore state-of-the-art methods, architectures, and technologies in artificial intelligence and soft robotics for space robotics.
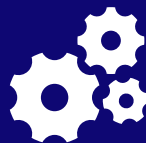
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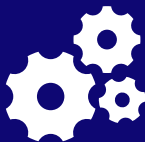
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About the Journal

Message from the Editor-in-Chief

Machines is an international, peer reviewed journal on machinery and engineering. It publishes research articles, reviews and communications.
Our aim is to encourage scientists to publish their experimental and theoretical results in as much detail as possible. There is no restriction on the length of the papers. Full experimental and/or methodical details must be provided.
There are, in addition, unique features of this journal: Manuscripts regarding research proposals and research ideas will be particularly welcomed; Electronic files or software regarding the full details of the calculation and experimental procedure - if unable to be published in a normal way can be deposited as supplementary material.

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