Special Issue

Space Sampling and Exploration Robotics

Message from the Guest Editors

Given the technical advantages of unmanned robotics, utilizing intelligent sampling robots to acquire planetary soil samples may be the most reliable and cost-effective solution for future human deep-space exploration. There are several unique challenges in unmanned sampling, such as long-distance time delay, uncertain underground formations, and limited sensor and mass resources; therefore, it is necessary to conduct research to improve the systems' adaptability to complicated geological formations, and also to detect planetary regolith. Space-soil–machine interactions involve 3D deformation, unsteady plastic flow, and rates affected by mechanical and environmental coupling, which are challenging problems that must be solved. We invite authors to contribute high-quality original research or review papers on planetary regolith and environments, space-soil–machine interaction modeling and validation, sampling robotics and systems, the detection of payloads, in situ resource utilization (ISRU), sensors and actuators in sampling, sampling tool design, in situ intelligent control, and other technologies related to space exploration robotics.

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