Theme and objective:

Techniques of Artificial Intelligence (AI) have promoted great advances in the application of space robotics. Specifically, pattern recognition, machine learning and deep learning, have been achieving much from data to feature, feature to model and a further higher level of information understanding. Such advances have applied to various space robotic systems. On the other hand, exploration activities on extraterrestrial bodies such as Mars and the moon, also experience profound growth. Powered by AI, the space robotic systems are promising in modeling, planning, control and beyond.

This Session focuses on the role of AI techniques for space robots, particularly learning-based computer vision and control methods, in helping to solve downstream tasks, such as situation awareness and pose estimation, model-based planning of space robots, advanced control with extreme dynamics and uncertainty. How to fully utilize the superiority of AI techniques while trading off between utility and cost is still an interesting yet challenging topic. The research on this issue will benefit a large range of applications on space robotics, industrial and transportation robotic systems, as well as autonomous driving.

Field:

Robotics control; Robot cluster; Formation control; Space manipulator; Advanced control; SLAM (Simultaneous Localization and Mapping);

Optics, Pattern recognition, Computer vision, Fault diagnosis and prognosis;

Machine learning; Deep learning; Reinforcement learning;