ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

DET - Robotic and Human Exploration of Extraterrestrial Habitats

Funded By	Ministero dell'Università e della Ricerca - MUR [P.iva/CF:96446770586] A.S.I. - AGENZIA SPAZIALE ITALIANA [P.iva/CF:03638121008] Dipartimento DET
Supervisor	INDRI MARINA - marina.indri@polito.it
Contact	INDRI MARINA - marina.indri@polito.it
Context of the research activity	Robotic and Human Exploration of Extraterrestrial Habitats, Architectures and Infrastructures. The focus is on the development of technologies for robotic exploration to characterize possible targets of human exploration and to prepare long-term human permanence in extraterrestrial space.
Objectives	Robotic exploration of extraterrestrial habitats requires smart ad-hoc solutions for path planning and autonomous navigation of AMRs (autonomous mobile robots), coping with fully unstructured and unknown environments issues, as well as long exploration missions and energy consumption limitations. The exploration of extraterrestrial space could benefit from a synergetic collaboration between humans and the robotic systems during long-term periods of human permanence, e.g., using rovers equipped with robotic arms suitable for collaboration with humans. The objective of the research activity is then focused on the development of smart solutions suitable for improving the Technology Readiness Levels (TRLs) on robotic space exploration in collaboration with humans, starting from relatively low TLRs (= 3) and to demonstrate their feasibility, usefulness, and performances in laboratory or relevant environments.
Skills and competencies for the development of the activity	Mobile robotics, ROS, manipulators and grasping, machine learning