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SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
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ADVANCED SPACECRAFT OPERATIONS TRAINING FOR UNDERGRADUATE UNIVERSITY STUDENTS

Abstract

Following the wide success of a practical course on Spacecraft Operations, which was initiated in cooperation between the Institute of Astronautics at the Technical University of Munich (TUM) and the DLR German Spacecraft Operations Center (GSOC) in 2009, a training environment for "Advanced Operations Concepts" was established at Munich Campus. While the basic operations course provides the necessary education that is needed for spacecraft utilization during the operations and disposal phase, Advanced Operations Concepts involve students in latest research activities in the field of Teleoperation of Space Robots. The focus is on robotic capture missions of uncooperative object, which are currently being planned and developed by a multitude of organizations. However, those missions impose different requirements on the operations center and differ highly from classical store-and-forward mission and payload operations. For that, a simulated mission control center was set up that allows real-time, operator-in-the-loop operations with alphanumeric and visual feedback. This feedback can be provided by software or HIL-simulation, using camera and sensor data from a 6-DOF Rendezvous Docking testbed. The curriculum envisages that students use the training environment in order to develop support elements and procedures for robot specific tasks in the course of the semester. Finally, the performance of their concepts is evaluated and assessed by a common task, for example compliance with a specific, operative constraint during the capture of a target object. This paper describes the training environment and discusses first results and industry feedback.