SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 1 (2A)

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DIGITAL SIMULATION OF LUNAR TERRAIN ENVIRONMENT AND ROVER CAMERA IMAGINATION FOR THE CHANG'E-3 MISSION

Abstract

From the beginning of the Chang'e-3 Mission Lunar Lander descent stage, vision navigation will be one of the key constituent elements of Chang'e-3 mission. Especially, to implement scouting task on lunar surface, timely and accurate camera images acquisition, vision navigation and environmental construction will be the prerequisite of the mission planning during the lunar rover tele-operation process. To train and evaluate the skills of the ground operation group and verify the validity of the ground system processing, Chang'e-3 Mission Explorer Digital Simulation System(CMEDSS)is developed to provide the simulation data source for the mission drilling of ground control center. Distinguished from the digital simulator of general flight missions, CMEDSS is required to realize the simulation of lunar topography and the rover camera imagination. Firstly, the architecture of CMEDSS is presented. Then, the approaches of the lunar terrain environment construction, the rover kinematics simulation, and the camera imagination mapping are discussed. Finally, the application of the simulation system CMEDSS during the Chang'e-3 mission preparation is introduced.