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VIRTUAL REALITY MULTIUSER SIMULATION OF SURFACE OPERATIONS FOR ARTEMIS AND MARS MISSIONS

Abstract

article

Virtual Reality Multiuser Simulation of Surface Operations for Artemis and Mars missions

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1 Abstract

With the rise in commercial and government space flight, more humans are expanding their reach into the space economy. Because of the increasing number of humans in space, there has been an increase in ground training for the crew. Currently, astronauts must start training for their missions 2 years in advance of the flight. Before the training can commence, physical mockups must be built to provide the crew with the necessary skills to complete the mission. With Virtual reality (VR), astronauts have the ability to train under conditions comparable to their missions without the need for an expensive mockup. With longer missions to Mars or the Moon, cheap onboard VR refresher simulations can provide the crew with the necessary proficiency needed to complete the mission. Currently, similar technology is used onboard the International Space Station with SAFER (Simplified Aid For EVA Rescue) training. This paper investigates the effectiveness of virtual reality in an Artemis surface operations training simulation. Utilizing SpaceCRAFT simulation platform, a multiuser IVA (intravehicle activity) and EVA (extravehicular activity) visually accurate lunar simulation was created. By using 3 meter surface resolution for the lunar surface and VIVOX voice chat feature, EVA crew members walked on the surface of the moon and hand surveyed the lunar regolith for useful resources. IVA crew members instructed the EVA crewmember toward possible resource hotspots and drove a Lunar rover to survey the regolith. After the training simulations ended, results showed a 60% increase in the accuracy of carrying out a collaborative mission for both IVA and EVA crew members.