Paper ID: 101673
student

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Advanced Systems, Technologies, and Innovations for Human Spaceflight (7)

Author: Ms. Takara Singh Read
United States

Mr. Hunter Singh
Northrop Grumman Corporation, United States
Ms. Ayumi Tsuyuki
Northrop Grumman Corporation, United States

TEXAS -HOLD'EM HAPTIC ORIENTATION FOR LANDING OR DOCKING ENGINEERING MECHANISM

Abstract

Sensory conflict can cause spatial disorientation in astronauts potentially leading to dangerous docking or landing conditions. There exists a specific gap identified in the Human Research Roadmap [1] concerning the rapid descent from microgravity on the soon to be launched Lunar Gateway to the Lunar surface. Similar concerns exist when docking to the Gateway or a Commercial LEO Destination. Team HOLDEM aims to develop a technology addressing these vestibular concerns with force-feedback haptics. While the design is underdevelopment solutions might include dynamic garments or augmented reality assisted realignment of the crew. The HOLDEM goal is to assist astronauts transitioning from micro-gravity to a new gravity environment such as the Moon, Mars or Earth who may be experiencing hypogravity related misperceptions. Activities such as planetary landings, extravehicular activities (EVA) and docking maneuvers might be improved by these techniques decreasing the risk associated with these critical mission operations. Using the principles of control engineering to integrate vibrational, pressurized or AR solutions into vehicle controls, disorientation issues caused by the reduced-gravity-related vestibular disconnects may be mitigated.