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CABIN SPACE STUDYING BASED ON HUMAN-CENTERED CONCEPT FOR PRESSURIZED ROVER

Abstract

The safety and security of the crew are the highest priorities among the necessary functions of a pressurized rover (PR). This paper introduces a human-centered concept aimed at ensuring crew safety and security in the driving environment within the cabin, as well as the status of considerations related to crew systems, including driving posture and visual information needed to achieve this.

In the section on driving posture, we will address proposals for human body support mechanism that ensure stability during operation in an environment where the vehicle experiences vibrations due to the Moon's one-sixth gravity, as well as climbing, descending, and banked driving on inclined surfaces.

Furthermore, unlike on Earth, there is no GPS on the Moon, making it necessary to rely on visual information for driving. In addition, in the monochrome world of direct sunlight and shadows cast by rocks and craters, it is difficult to accurately perceive the lunar environment with the naked eye. Therefore, in the section on visual information, we will address a proposal to overlay driving assistance displays, such as the driving route, onto images from external cameras and project them into the front compartment for the crew's safety and security while driving.

Finally, we will also address a method called Human In The Loop (HITL) sensory evaluation, which uses full-scale static mock-ups and dynamic simulators for the design and verification of components operated by the crew in the upcoming phases.