ARSIS 4.0 (Augmented Reality Space Informatics System)

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Abstract
SUITS which stands for Spacesuit User Interface Technologies for Students is an ongoing challenge presented by NASA to farm software ideas and prototypes from college students around the world to create a system that can help NASA improve autonomy, efficiency and efficacy of communication between mission control and an Astronaut physically on the moon. In answer to these challenges, we have developed ARSIS 4.0 which seamlessly integrates Augmented Reality, Virtual Reality and a desktop portal to create a cohesive mixed reality experience that we are calling telepresence. The capabilities provided by ARSIS improve situational awareness and more effectively equip astronauts for the unpredictable environments they will face while helping mission control maintain a clear understanding of what is transpiring during a mission via telepresence so that they can more effectively guide and communicate with the astronaut.

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This student presentation is available at ScholarWorks: https://scholarworks.boisestate.edu/under_showcase_2021/
Challenge

Annual challenge presented by NASA to create a system that can help NASA improve autonomy, efficiency and efficacy of communication between mission control and an Astronaut physically on the moon.

Solution

In answer to these challenges, we have developed ARSIS 4.0 which seamlessly integrates Augmented Reality, Virtual Reality and a desktop portal to create a cohesive mixed reality experience that we are calling telepresence.

Hololens 2

The Hololens 2 portal overlays an astronaut's view with a HUD that assists them on Extravehicular Activities. Some functionalities include; displaying biometrics, procedure guides, geological sampling tools, navigation assistance and full telepresence capabilities with Mission Control via the VR and Desktop portals. Menus can be navigated using voice, gaze tracking, and hand tracking to allow for natural control methods.

Virtual Reality

The VR portal allows Mission Control to see what the astronaut is seeing at real-world scale and equips them with tools to give the astronaut detailed spatial directions by drawing and placing with the VR headset controller.

Desktop App

The desktop portal displays the astronauts position as well as a map of the environment that is captured in real time by the Hololens 2. Mission Control can then give directions, that will appear in the astronauts vision.