



**SPACE VILLAGES**

Hyperrealistic View, with Precise Positioning, Extreme Reality (XR) Professional Training, Mission Planning, Mission Implementatino

C3 platform for Multi-user Space/ Earth Tele-Robotic and Astronaut/ Professional Tasks & Missions



## Key Features Release 1

- Two users / astronauts task planning training, task implementation
- Mission control manager, with virtual views into XR environment for C3
- AR procedure assistance and monitoring for users training in XR environment
- Hyperrealistic environment and objects with photo-realistic quality.
- Redirected Walking: XR 4x the working area in virtual space, no collisions in real space.
- Full virtualization in environment for users & objects for realistic & immersive training
- Precise hand tracking for training with tools and small objects for user and tele-robotics
- Customizable environment for Lunar/Space operations & tele-robotics remote operations
- Compatible with highest quality professional XR headsets

## Key Specifications Release 1

- 5x5 meters work area with XR walkable space of 10x10 meters, within very large view space
- 2 users with XR headsets collaborate in the same physical and extended virtualized environments
- Audio and video link with mission control operator
- HD video streaming from mission control to external viewers
- Virtualized objects with mm scale precision tracking
- Direct user interaction with real objects virtualized in the XR space using hands, no controllers
- Hyperrealistic 3D environment, up to 10 million polygons environments and 90 Hz refresh rates
- Compatible with Varjo™ high-end industrial grade simulation headsets and Nvidia RTX graphic acceleration boards
- Server, user tools, software, software libraries & customization priced for professional markets



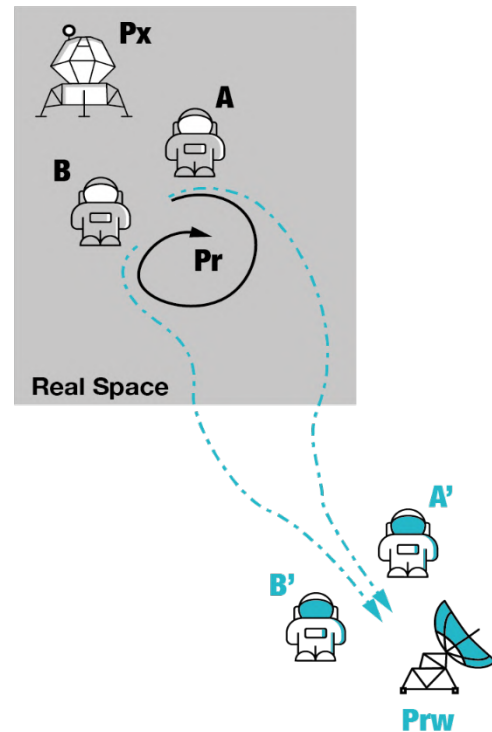
## XR Mission Control

Users  
Audio Link

User POV  
Monitor

VR  
Cameras

Training  
Scenarios



### Virtual Walkable Space Enabled by Redirected Walking

*Px* = Starting point  
*Pr* = End point in real space  
*Prw* = End point in virtual space due to redirected walking

*A* = User 1  
*B* = User 2  
*A'* = Position of User 1 in RW space  
*B'* = Position of User 2 in RW space

## DESCRIPTION

Astronaut and tele-robotic training, missions, and mission control is complex, in particular for OSAM & ISAM applications in LEO or Deep Space, where diverse sets of cabling, connections, components, or structures need to be assembled correctly, with limited margin & high cost for errors. Collaborative work, two astronauts or robots or one of each working together without collisions or errors in Phase I, with remote assistance from a mission control operator or AI, is required for accurate and productive space assembly, fueling, missions, R&D, and manufacturing.

### Release 2 will expand users as customers demand.

Platform provides a virtual-mixed environment for two astronauts and a mission control operator, with full VR immersive hyperrealistic scenario and objects with AR (augmented reality) data and prompts. The environment and infrastructure can be customized for diverse scenario (LEO, Lunar, Mars, space, tele-robotics) tasks, tools, and training modules and situations. Full immersion and hands on scenarios are the best tradeoff for cost-effective training, before exposing user to real hardware in free fall or low gravity, reducing risks and enabling correct and precise, least energy path & least time procedures to complete tasks.

The platform integrates Redirected Walking technology, initially for 2 agents, to initially increase the perceived work area 4 times from real space, without users notice. 5x5 meters room is extended to 10x10 meters XR area, fully walkable for 2 person training, allowing XR simulator deployment in standard conference room size facilities.

Basic procedures are already implemented: unloading/loading on Luna or in LEO, component assembly, cabling, connectors and switches, and AR validation checklists and guides for users to train efficiently to achieve tasks within mission or process parameters.

**Focus on Training, Mission/Process Planning, C3 for Space & Earth, Human & Tele-Robotics Tasks**

**Environments, Tasks, Tools, Procedures, Scenarios, and 3D Objects customization available from Space Villages, Inc.**



SPACE VILLAGES



Contact: Bo Varga

[bvarga@spacevillages.net](mailto:bvarga@spacevillages.net)

[www.spacevillages.net](http://www.spacevillages.net)

Silicon Valley