

# Traversing Mars Through Robotic Movement

**Team members:** Miles Popiela, Cyaira Hughes, Ian Jaffe | **Faculty advisers:** Kostadin Damevski, Shawn Brixey | **Sponsor:** VCU, ASPIRE, CCI

## Our Goal:

We wanted to create a data visualization method of Martian geography using robotic movement. The robot will traverse the planet and showcase interesting geographical features in forms of movement and light.

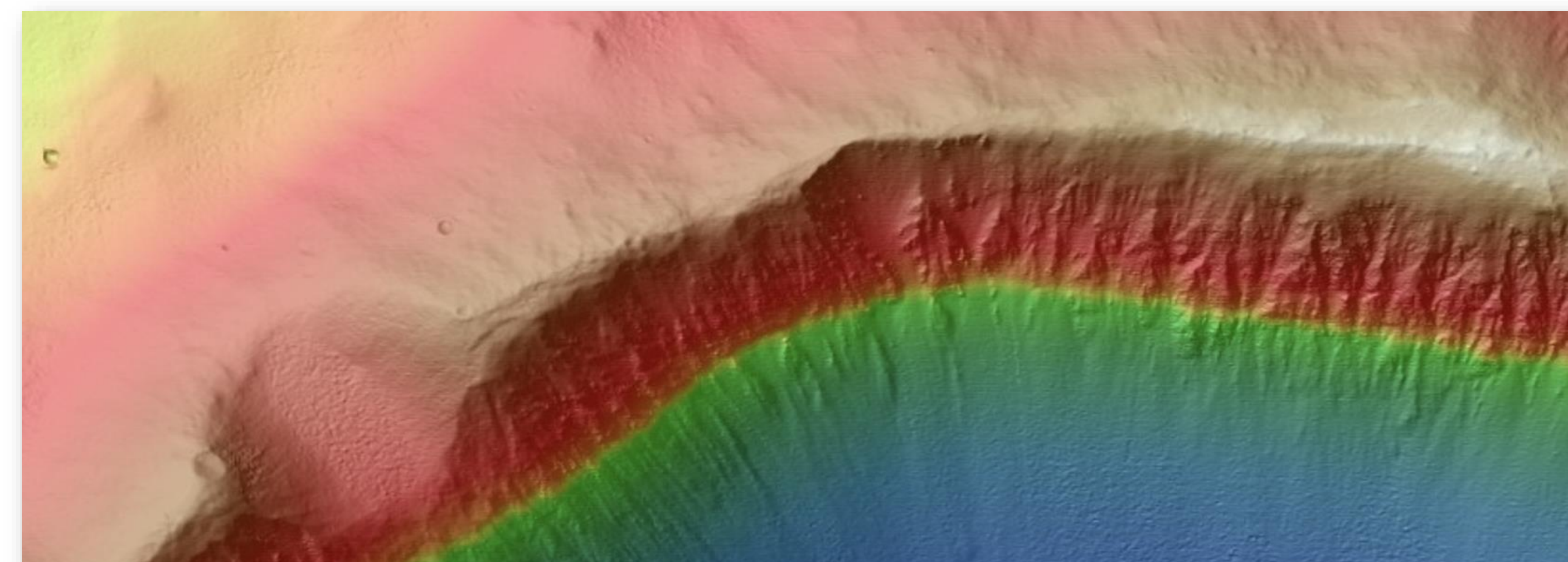


## Interface:

- Unity software connected to robotic externally-guided motion interface over UDP socket connection
- User selects geographical region and region animation file is read and translated as movements on a gameobject
- Gameobject sends transformational values to RaspberryPi and EGM

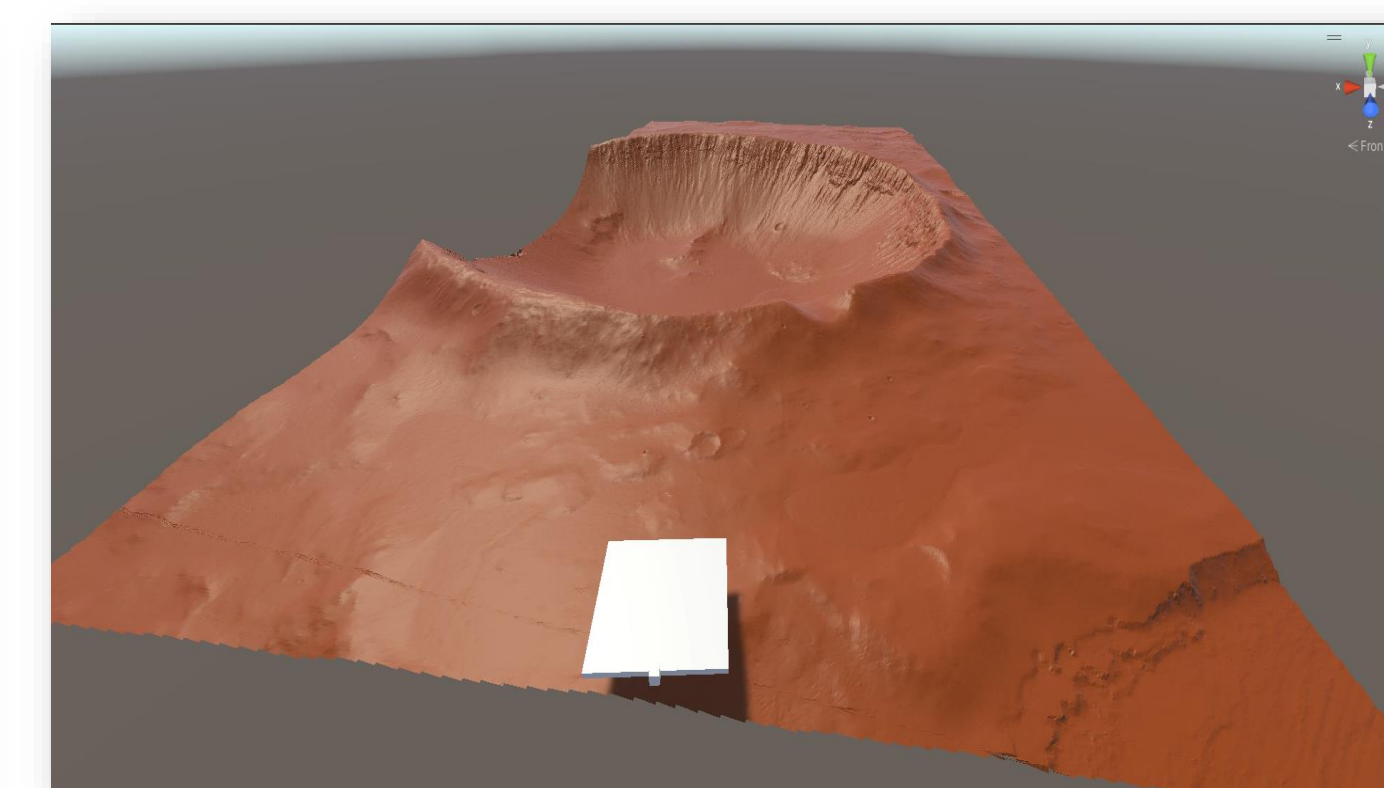
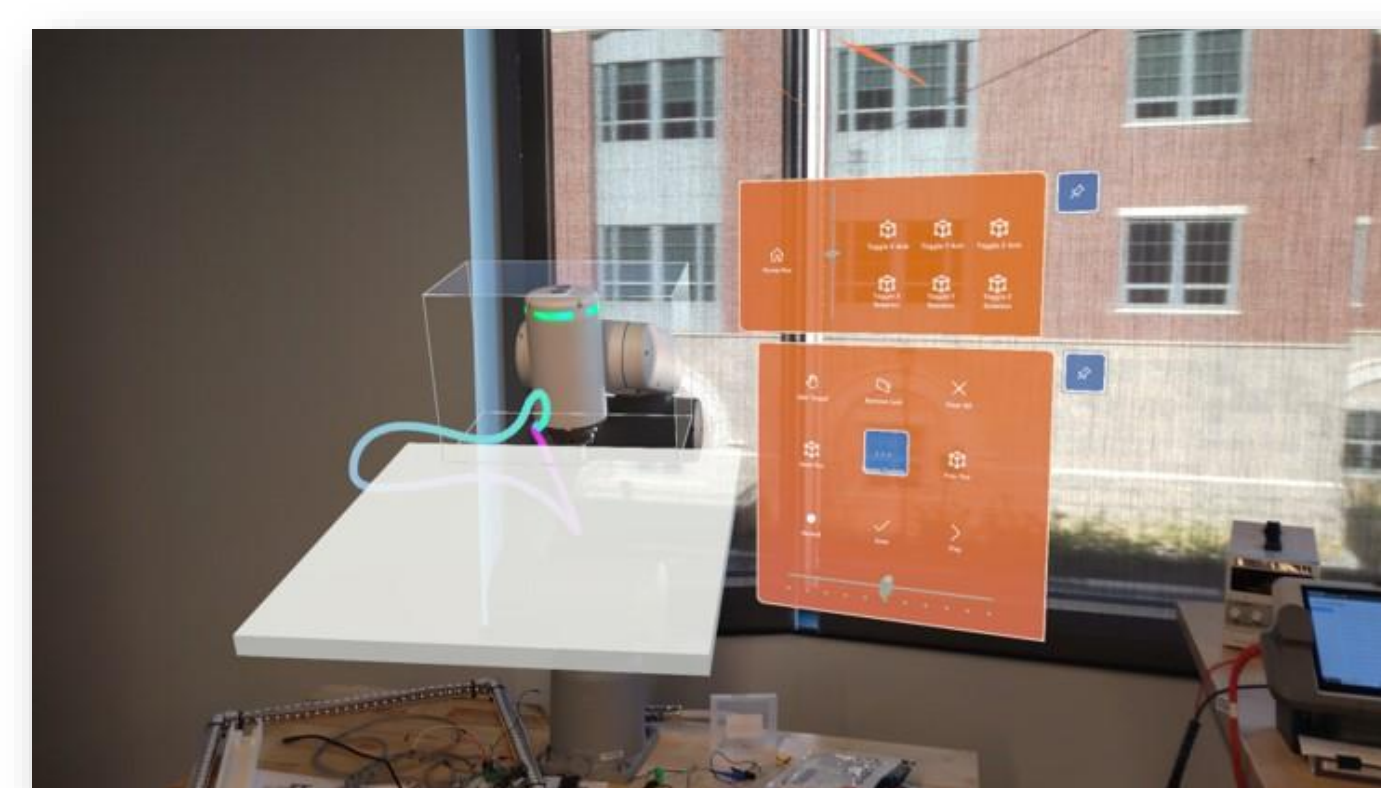
## Geographical Data:

- University of Arizona Lunar & Planetary Lab HiRISE image 3D models
- Interesting geography chosen for project



## Animations:

- Utilize Microsoft HoloLens to create human-like movements across geographical models and save movements in .csv files
- Movements are unique to each model and based on geography
- Interesting geographical sections exaggerated



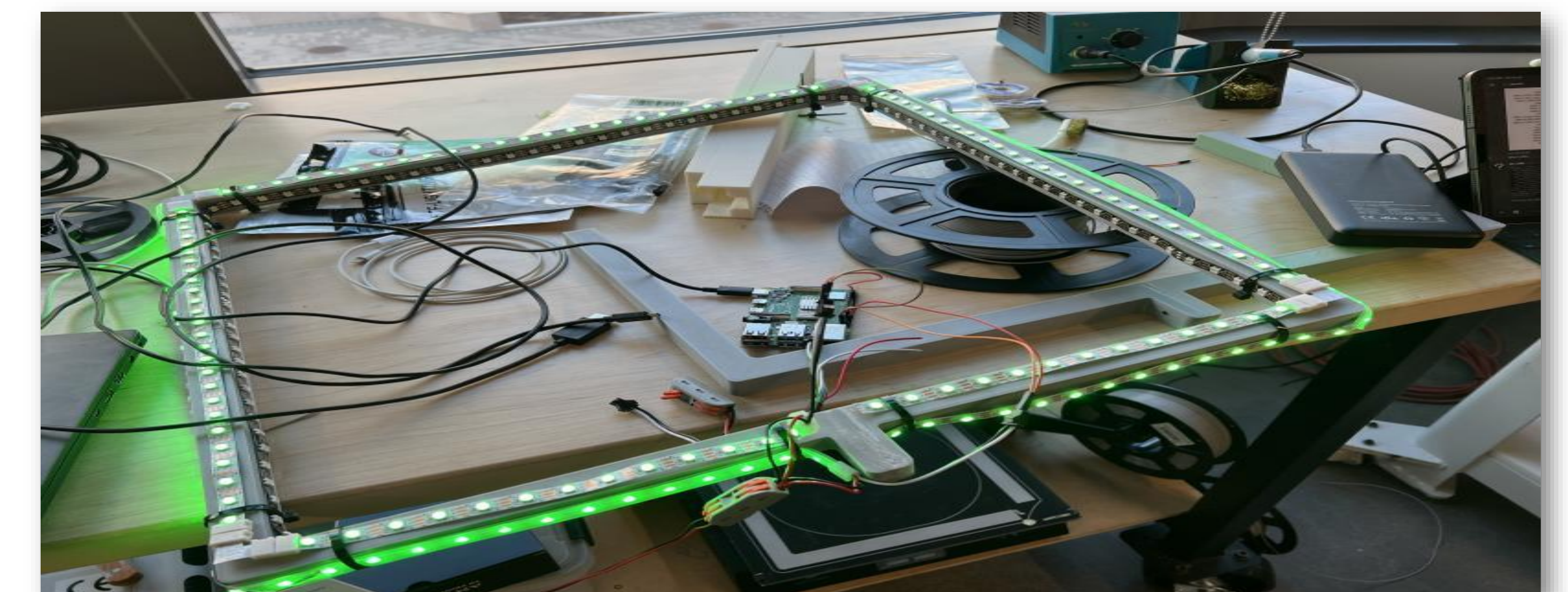
## Planchette:

3D printed square represents 1 square kilometer distance across model section

## LED Visualization:

Signaled by RaspberryPi script to change hue of light depending on transformative position

- Blue: High elevation
- White: Horizon
- Red: Low elevation



## Continuation:

- Generate remaining Mars terrain
- Improve accuracy of terrain traversal
- Train learning model to produce animations
- Apply path navigation
- Use for other types of data visualization

## Important Links:

- <https://areobrowser.com/>
- <https://solarsystem.nasa.gov/resources/2372/mars-3d-model/>