

# Traversing Mars Through Robotic Movement

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Project Number: CS 23-330

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Our team has developed an immersive project that brings Mars' landscape to life using Raspberry Pi, Unity, and LED strips. This innovative experience allows users to explore Martian topography without specialized equipment or physical travel. We integrate Raspberry Pi and Unity to create dynamic animations and render Mars' surface. A virtual planchette calculates a square's center, with its location sent to the Raspberry Pi, which determines the LED strips' color based on the square's height. The animation remains fluid and human-like. Microsoft HoloLens enhances the experience by recording developers' hand movements on the virtual Martian surface and enabling manual robot manipulation. Users can interact with Mars, selecting regions for the planchette to represent. Our unique system combines an ABB one-arm robot with mixed reality programming and LED visualization to accurately represent Mars' topography. The LED-lit square planchette employs a color-coded system corresponding to the Martian landscape. This engaging, interactive experience blends physical robot motion and dynamic LED visualizations, offering users an innovative way to explore and understand Mars. This groundbreaking project opens up new possibilities for applications in education, entertainment, and industry, while inspiring future space exploration endeavors. Our immersive Martian experience captivates audiences and stimulates curiosity about our solar system's wonders.

Keywords: Python, Raspberry Pi, Unity and Microsoft HoloLens

