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MARSCAPE: Exploring the Martian Landscape through PARM (Projected Augmented Relief Model)

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In the past decade through the proliferation of digital technologies, citizen science has grown in popularity and is now used as a data analysis tool across a range of disciplines. Due to the abundance of instruments currently collecting data, planetary science has become a prime candidate for, and adaptor of, citizen science platforms (Sprinks et al., 2015). Current projects (planetfour.org, moonzoo.org etc.) take a Virtual Citizen Science (VCS) approach (Reed et al., 2012), gathering scientific analysis from remotely sensed imagery that's presented to the public through a website interface. However, in presenting the data 'on screen' in a 2D form, issues regarding interpretation and context arise – for instance, depending on the angle of the Sun when the picture was taken, images of craters taken from overhead (i.e. from orbit) may appear to be a mountain.

In order to address such issues regarding context and interpretation, we present MARSCAPE, an engaging and informative display that communicates key aspects of the Martian landscape to the public, including the nature and scale of landscape forms, using a unique combination of physical landscape models and synchronised 3D perspective views. It combines the proven power of physical relief models for providing overviews of landscape and discerning more subtle spatial forms and relationships, with first person game-like perspectives on the ground. It also includes the capability of projecting data 'overlays' onto the physical model of surface, such as imagery, geological mapping, or comparison examples from Earth to provide context.

The aims of the MARSCAPE project are not only to solve the issues regarding context and interpretation when studying the Martian surface, but also to educate the observer in regards to the geophysical processes that occur on Mars and how they relate to those that are happening on Earth. Through using a physical display presented in a public space citizen science can be moved from an individual process conducted in isolation to a public and shared experience, where scientific analysis and understanding can be discussed. Ultimately it is hoped that this can result in a more enriching experience for citizen scientists, who give up their time and effort for free and on whose participation the success of a citizen science project relies on.

References:

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