TITLE: Super-resolution restoration applied to the characterisation of dynamic surface changes on the Martian surface

ABSTRACT BODY:

Abstract (2,250 Maximum Characters): Higher spatial resolution imaging data is always desirable to the international community of planetary scientists interested in improving understanding of surface formation processes. We have previously developed a novel Super-resolution restoration (SRR) technique using Gotcha sub-pixel matching [*Shin & Muller, PR, 2012*], orthorectification, segmentation, and 4th order PDE-TV, called GPT SRR [*Tao & Muller, PSS, 2016*]. This technique is able to restore 5cm-12.5cm near rover scale images (Navcam at a range of ≥5m) from multi-angle repeat-pass 25cm resolution MRO HiRISE images [*Tao & Muller, ISPRS, 2016*].

We have successfully applied the GPT-SRR to the MER and MSL missions (http://www.progisweb.eu), as well as the alleged site of the Beagle-2 spacecraft (https://www.flickr.com/photos/uclnews/albums/72157667609698345). In this work, we further apply GPT-SRR on areas with known dynamic changes, including Recurring Slope Lineae (RSL), Gullies, and Polar Dune Flows. We restore static surface and meanwhile track the dynamic features to characterise the "change", including directions and speed of the changes. We also demonstrate that such repeat images can be used to image the MER-A rover stuck in the sands.

CURRENT * CATEGORY: Other

CURRENT : None

AUTHORS (FIRST NAME, LAST NAME): Yu Tao[1], Jan-Peter Muller[1]

INSTITUTIONS (ALL): 1. Mullard Space Science Laboratory, University College London, Dorking, Surrey, United Kingdom.