Fusion of MOLA-based DEMs and HiRISE Images for Large-Scale Mars Mapping

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Abstract : In this project, we used MOLA-based DEMs to orthorectify HiRISE optical images. The MOLA data was interpolated using the kriging interpolation technique. Corresponding tie points were then digitized from both datasets. These points were employed in co-registering both datasets using GIS analysis tools. Different transformation models, including the affine and projective transformation models, were used with different sets and distributions of tie points. Additionally, we evaluated the use of the MOLA elevations in co-registering the MOLA and HiRISE datasets. The planimetric RMSEs achieved for each model are reported. Results suggested the use of 3D-2D transformation models.

Keywords : photogrammetry, Mars, MOLA, HiRISE
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