



Information Technology and Software

Automatic Extraction of Planetary Image Features

A method for the extraction of Lunar data and/or other planetary features

NASA's Goddard Space Flight Center's method for the extraction of Lunar data and/or planetary features is a method developed to extract Lunar features based on the combination of several image processing techniques. The technology was developed to extract features from images in low-contrast and uneven illumination conditions. The image processing techniques can include, but is not limited to, a watershed segmentation and/or the generalized Hough Transform.

BENEFITS

- Automated—automated and robust feature extraction can analyze low contrast and uneven illumination characteristics
- Versatile—this method can be applied for the extraction of Lunar features and can also be generalized to other planetary images and other image registration applications
- The generalized Hough Transform and the watershed segmentation are used together for any type of image segmentation for accurate registration of multi-temporal, multi-sensor, and multi-view images

technology solution

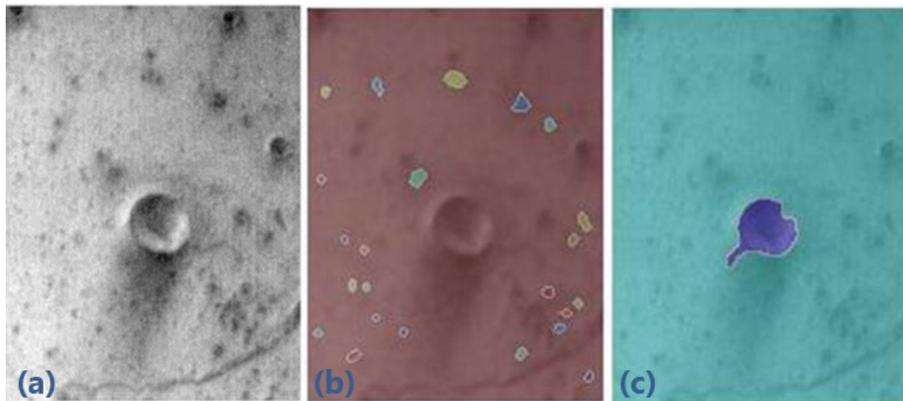


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THE TECHNOLOGY

Many automatic feature extraction methods have been proposed and utilized for Earth remote sensing images, but these methods are not always applicable to Lunar data that often present low contrast and uneven illumination characteristics. The boundary of Lunar features is not always well defined, and it is therefore somewhat difficult to segment and characterize Lunar images. With the large number of new Lunar data that will be collected in the next few years, it is important to implement an automated method to extract these features, and to perform tasks such as image registration.



Feature extraction from data collected during the Mars Global Surveyor mission. The original image (a), the close contour features (b) and the elliptic shape features (c) are shown.

APPLICATIONS

The technology has several potential applications:

Terrain mapping – can be applied to supplement existing feature extraction methods already in use for Earth remote sensing

Military – synthetic-aperture radar (SAR) images

Medical – mammograms or MRI's

PUBLICATIONS

U.S. Patent 8,355,579

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NP-2014-08-1095-HQ

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GSC-15730-1

