Feature matching in planetary images with multiple spatial resolutions by using SIFT algorithm

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This study uses feature matching in planetary images with multiple spatial resolution. To know where lower altitude images are taken in high altitude images is performed based on images without the position and attitude of spacecraft in this study. The lower altitude images of AMICA on-board the Hayabusa spacecraft, asteroid probe are found as a correspondence of image features (keypoint) in higher altitude images. We adopted the Scale Invariant Features Transform (SIFT) to represent a kind of key-point of image for image feature matching. In generally, the SIFT keypoint is robust to scale transition, change of lighting condition, parallel displacement, and rotation of image, so this keypoint is suitable to feature matching of planetary image which contains of scale and rotation between different images. As a result, for the improvement of accuracy of feature matching, it is important to have a preprocessing of image (e.g., equalizing).

Keywords: planetary image, SIFT, feature matching, AMICA