Additionally, once orbit parameters are settled upon, the same tools can be used to model system performance, and execute more focused trade studies as requirements are being developed and analyzed. This toolset offers a cohesive model-based systems engineering tool to be used as mission concepts are developed and in the development and analysis of top-level system requirements.

This work was done by Benjamin M. Haber and Joseph J. Green of Caltech for NASA’s Jet Propulsion Laboratory. For more information, contact iaooffice@jpl.nasa.gov.

This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-47236.

**Real-Time Feature Tracking Using Homography**

NASA's Jet Propulsion Laboratory, Pasadena, California

This software finds feature point correspondences in sequences of images. It is designed for feature matching in aerial imagery. Feature matching is a fundamental step in a number of important image processing operations: calibrating the cameras in a camera array, stabilizing images in aerial movies, geo-registration of images, and generating high-fidelity surface maps from aerial movies.

The method uses a Shi-Tomasi corner detector and normalized cross-correlation. This process is likely to result in the production of some mismatches. The feature set is cleaned up using the assumption that there is a large planar patch visible in both images. At high altitude, this assumption is often reasonable. A mathematical transformation, called an homography, is developed that allows us to predict the position in...