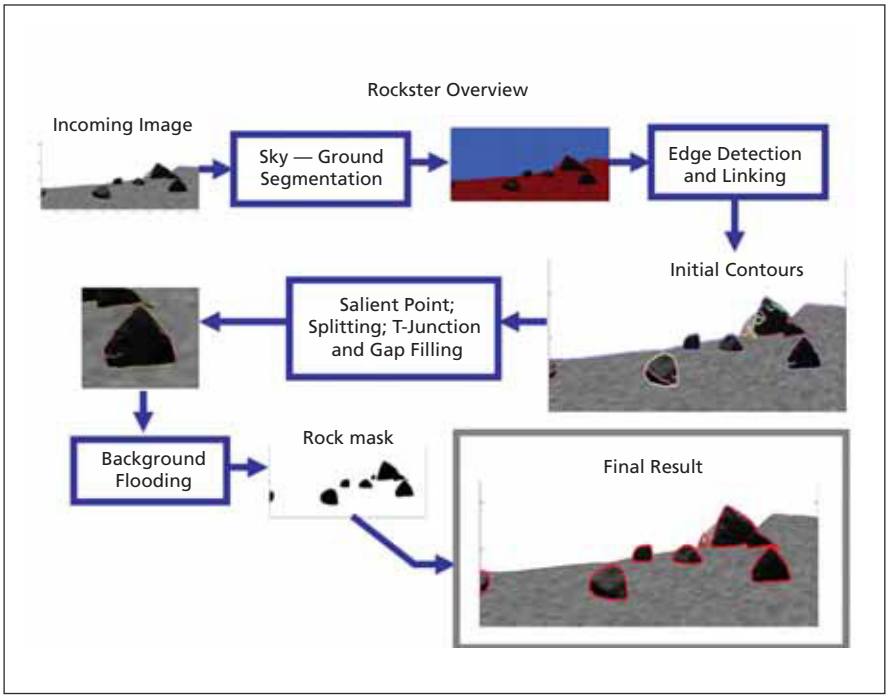

An **Overview of the Rockster** rock segmentation algorithm.

present in a scene (higher recall) than previous rock detection schemes, while maintaining a high precision rate (objects identified as rocks, truly are rocks).

Rockster has been integrated successfully into a number of recent, high-level demonstrations, including the SOOPS (Science Operations on Planetary Surfaces) demo, which used a rock exploration scenario to let scientists gain hands-on experience with an autonomous science capability in a simulated environment, and live exercises of the OASIS (Onboard Autonomous Science Investigation System)/CLARAty (Coupled Layer Architecture for Robotic Autonomy) software which were carried out in real-time in the JPL Mars Yard onboard the FIDO Rover (a close relative of the twin Mars Exploration Rovers).

This program was written by Michael Burl of Caltech for NASA's Jet Propulsion Laboratory.

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-44417.

System for Continuous Delivery of MODIS Imagery to Internet Mapping Applications

NASA's Jet Propulsion Laboratory, Pasadena, California

This software represents a complete, unsupervised processing chain that generates a continuously updating global image of the Earth from the most recent available MODIS Level 1B scenes.

The software constantly updates a global image of the Earth at 250 m per pixel. It uses an event-driven scheduler to manage asynchronous image generation tasks on a cluster of computers. The output composite image is tightly integrated in the JPL OnEarth WMS server, which offers direct access to the global image to any Web Mapping Service (WMS) compatible client, and also supports KML generation for Google Earth. The resulting Earth image composite is permanently available as an Internet service to WMS compatible mapping applications. This application can handle the throughput of the MODIS satellite, processing more than 80GB of Level 1B input data each day.

There are two main components to this software package: DailyHarvest and DailyPlanet. The first component is a scene harvester that manages a local copy of available MODIS scenes for the past few days. When active, the DailyHarvest module checks the current state of the MODIS source repository (LAADS) against the local state. Any new scene is downloaded, and the local copy state is altered to reflect the availability of the new scene. The second component, DailyPlanet, is then made aware of the change in the archive state. Once the remote and local scenes are synchronized, the DailyHarvest module reschedules itself, effectively running every few minutes.

The DailyPlanet module functions as an event-driven scheduler that manages the scene transitions from raw scenes to the global composite. There are three separate scene queues: a raw scene queue, a confirmed scene queue, and an image fragment queue. Each scene makes the transition to the next queue based on the result of an external process. The transition from raw-to-confirmed is done by extracting the scene metadata and applying a suitability test, confirming that the scene is not a night scene, and that the latitude range is within the S72-N72. The transition from the confirmed scene queue to the image fragment queue is the result of the successful completion of an external task that produces a visual image in geographical coordinates from a MODIS Level1B scene. This processing is done using the HDFLook MODIS software package, running on a remote computer.

The final task is the integration of the image fragments into the global composite, handled by a custom written external task. If an error is detected during any of the transitions, the error is logged and the scene is dropped from the processing queues. Most of the remote processing resources can be configured and are used in parallel for greater efficiency.

This work was done by Lucian Plesea of Caltech for NASA's Jet Propulsion Laboratory.

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-45778.