signed to circumvent bandwidth limitations of typical HEC file systems by exploiting the faster inter-processor bandwidth to move output data from compute nodes to designated I/O nodes as quickly as possible, thereby minimizing the I/O wait time. This utility has successfully demonstrated a significant performance improvement within a major NASA weather application.

This work was done by Thomas Clune of Goddard Space Flight Center and Shujia Zhou of Northrop Grumman. For further information, contact the Goddard Innovative Partnerships Office at (301) 286-5810. GSC-15751-1

Planetary Image Geometry Library

The Planetary Image Geometry (PIG) library is a multi-mission library used for projecting images (EDRs, or Experiment Data Records) and managing their geometry for *in-situ* missions. A collection of models describes cameras and their articulation, allowing application programs such as mosaickers, terrain generators, and pointing correction tools to be written in a multi-mission manner, without any knowledge of parameters specific to the supported missions.

Camera model objects allow transformation of image coordinates to and from view vectors in XYZ space. Pointing models, specific to each mission, describe how to orient the camera models based on telemetry or other information. Surface models describe the surface in general terms. Coordinate system objects manage the various coordinate systems involved in most missions. File objects manage access to metadata (labels, including telemetry information) in the input EDRs and RDRs (Reduced Data Records). Label models manage metadata information in output files. Site objects keep track of different locations where the spacecraft might be at a given time. Radiometry models allow correction of radiometry for an image. Mission objects contain basic mission parameters. Pointing adjustment ("nav") files allow pointing to be corrected.

The object-oriented structure (C++) makes it easy to subclass just the pieces of the library that are truly mission-specific. Typically, this involves just the pointing model and coordinate systems, and parts of the file model. Once the library was developed (initially for Mars Polar Lander, MPL), adding new missions ranged from two days to a few months, resulting in significant cost savings as compared to rewriting all the application programs for each mission. Currently supported missions include Mars Pathfinder (MPF), MPL, Mars Exploration Rover (MER), Phoenix, and Mars Science Lab (MSL). Applications based on this library create the majority of operational image RDRs for those missions. A Java wrapper around the library allows parts of it to be used from Java code (via a native JNI interface). Future conversions of all or part of the library to Java are contemplated.

This work was done by Robert G. Deen and Oleg Pariser of Caltech for NASA's Jet Propulsion Laboratory.

The software used in this innovation is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-46658.