Marsviewer

NASA's Jet Propulsion Laboratory, Pasadena, California

Marsviewer is a multi-platform application designed to aid in quality control, browsing, and analysis of original science product images (Experiment Data Records, or EDRs) and derived image data products (Reduced Data Records, or RDRs) returned by the Mars Explorer Rover (MER) mission. Marsviewer offers an abstraction of the products' organization via a "file finder." For example, the application "understands" the file structure and filename conventions of the MER Operational Storage Server, helping the user to navigate this complex file system to find desired images. Marsviewer also works with a flat file system, remote-operations file systems, image-archive file systems, and others. All EDRs found for a given solar day (Sol) are displayed in a list, optionally with thumbnail images. Once the user selects an image from the list, a tabbed pane conveniently displays the original source image and all associated RDRs. Marsviewer provides the option of overlaying derived images upon the source image, resulting in an easier-to-interpret color representation of the data. Display manipulations such as zoom, data range adjustment, contrast enhancement, and contour control are available. Image metadata (labels) from the current image can be displayed and searched. The architecture of the program is extensible: new types of RDRs can be installed and new file finders can be added to adapt the program to different file structures and different filename conventions. This keeps the application flexible and provides an opportunity for reuse with future rover missions.

This program was written by Nicholas Toole and Robert Deen of Caltech for **NASA's Jet Propulsion Laboratory**. *Further information is contained in a TSP (see page 1).*

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-40852.

Tool for Analysis and Reduction of Scientific Data

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The Automated Virtual Laboratory Tool (AVLT) is designed to be an intelligent scientific analysis assistant (SAA) system, dedicated to facilitating analysis and reduction of data collected by spaceborne scientific instruments. Within the SAA, a variety of conventional and artificial-intelligence software tools are integrated into a uniform system architecture. The AVLT interfaces with the user through a sophisticated graphical user interface that is part of the SAA environment. Functions of the AVLT include the following:

- Understanding the formats of input data files and automatically translating the files into whatever other formats are required for processing by analysis functions provided by users;
- Providing a graphical workspace, and assistance in using the workspace, wherein scientists can create computational experiments for exploration of data, formation of hypotheses, application of analysis functions, interpretation, and presentation, using concepts that are familiar within the scientists' domains of specialty;
- Providing a subsystem for planning a multistep analysis process to attain a goal based partly on prior computational experiments or on *a priori* knowledge;
- Constructing a knowledge base of data-exploration methods and analysis and interpretation algorithms; and
- Providing sophisticated graphical-presentation software to assist in visualization of data.

This program was written by Mark James of Caltech for **NASA's Jet Propulsion Laboratory**. *Further information is contained in a TSP (see page 1). .*

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-42514.

ASPEN Version 3.0

NASA's Jet Propulsion Laboratory, Pasadena, California

The Automated Scheduling and Planning Environment (ASPEN) computer program has been updated to version 3.0. ASPEN as a whole (up to version 2.0) has been summarized, and selected aspects of ASPEN have been discussed in several previous *NASA Tech Briefs* articles. Restated briefly, ASPEN is a modular, reconfigurable, application software framework for solving batch problems that involve reasoning about time, activities, states, and resources. Applications of ASPEN can include planning spacecraft missions, scheduling of personnel, and managing supply chains, inventories, and production lines. ASPEN 3.0 can be customized for a wide range of applications and for a variety of computing environments that include various central processing units and random-access memories. Domain-specific reasoning modules (e.g., modules for determining orbits for spacecraft) can easily be plugged into ASPEN 3.0. Improvements over other, similar software that have been incorporated into ASPEN 3.0 include a provision for more expressive time-line values, new parsing capabilities afforded by an ASPEN language based on Extensible Markup Language, improved search capabilities, and improved interfaces to other, utility-type software (notably including MATLAB).

This program was written by Gregg Rabideau, Steve Chien, Russell Knight, Steven Schaffer, Daniel Tran, Benjamin Cichy, and Robert Sherwood of Caltech for **NASA's Jet Propulsion Laboratory**. *Further information is contained in a TSP (see page 1).*

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-41986.