Machine Aided Indexing and the NASA Thesaurus

Machine Aided Indexing (MAI) is a Web-based application program for aiding the indexing of literature in the NASA Scientific and Technical Information (STI) Database. MAI was designed to be a convenient, fully interactive tool for determining the subject matter of documents and identifying keywords. The heart of MAI is a natural-language processor that accepts, as input, any user-supplied text, including abstracts, full documents, and Web pages. Within seconds, the text is analyzed and a ranked list of terms is generated. The 17,800 terms of the NASA Thesaurus serve as the foundation of the knowledge base used by MAI. The NASA Thesaurus defines a standard vocabulary, the use of which enables MAI to assist in ensuring that STI documents are uniformly and consistently accessible. Of particular interest to traditional users of the NASA Thesaurus, MAI incorporates a fully searchable thesaurus display module that affords word-search and hierarchy-navigation capabilities that make it much easier and less time-consuming to look up terms and browse, relative to lookup and browsing in older print and Portable Document Format (PDF) digital versions of the Thesaurus. In addition, because MAI is centrally hosted, the Thesaurus data are always current.

This program was written by Bill von Ofenheim for **Langley Research Center**. *For further information, access http://mai.larc.nasa.gov.*
LAR-17110-1

Arbitrating Control of Control and Display Units

The ARINC 739 Switch is a computer program that arbitrates control of two multi-function control and display units (MCDUs) between (1) a commercial flight-management computer (FMC) and (2) NASA software used in research on transport aircraft. (MCDUs are the primary interfaces between pilots and FMCs on many commercial aircraft.) This program was recently redesigned into a software library that can be embedded in research application programs. As part of the redesign, this software was combined with software for creating custom pages of information to be displayed on a CDU. This software commands independent switching of the left (pilot's) and right (copilot's) MCDUs. For example, a custom CDU page can control the left CDU while the FMC controls the right CDU. The software uses menu keys to switch control of the CDU between the FMC or a custom CDU page. The software provides an interface that enables custom CDU pages to insert keystrokes into the FMC's CDU input interface. This feature allows the custom CDU pages to manipulate the FMC as if it were a pilot.

This program was written by Michael M. Madden of **Langley Research Center** *and Paul C. Sugden of Unisys Corp. Further information is contained in a TSP (see page 1).*
LAR-17178-1

Web-Based Software for Managing Research

aeroCOMPASS is a software system, originally designed to aid in the management of wind tunnels at Langley Research Center, that could be adapted to provide similar aid to other enterprises in which research is performed in common laboratory facilities by users who may be geographically dispersed. Included in aeroCOMPASS is Web-interface software that provides a single, convenient portal to a set of project- and test-related software tools and other application programs. The heart of aeroCOMPASS is a user-oriented document-management software subsystem that enables geographically dispersed users to easily share and manage a variety of documents. A principle of "write once, read many" is implemented throughout aeroCOMPASS to eliminate the need for multiple entry of the same information. The Web framework of aeroCOMPASS provides links to client-side application programs that are fully integrated with databases and server-side application programs. Other subsystems of aeroCOMPASS include ones for reserving hardware, tracking of requests and feedback from users, generating interactive notes, administration of a customer-satisfaction questionnaire, managing execution of tests, managing archives of metadata about tests, planning tests, and providing on-line help and instruction for users.

This program was written by Sherwood T. Hoadley; Anthony M. Ingraldi; Kerry M. Gough; Charles Fox, Jr.; Catherine K. Cronin; Andrew G. Hagemann; Guy T. Kemmerly; and Wesley L. Goodman of **Langley Research Center**. *For further information, access http://aerocompass.larc.nasa.gov.*

This invention is owned by NASA, and a patent application has been filed. Inquiries concerning nonexclusive or exclusive license for its commercial development should be addressed to the Patent Counsel, Langley Research Center, at (757) 864-3521. Refer to LAR-16442.

Driver Code for Adaptive Optics

A special-purpose computer code for a deformable-mirror adaptive-optics control system transmits pixel-registered control from (1) a personal computer running software that generates the control data to (2) a circuit board with 128 digital-to-analog converters (DACs) that generate voltages to drive the deformable-mirror actuators. This program reads control-voltage codes from a text file, then sends them, via the computer's parallel port, to a circuit board with four AD5535 (or equivalent) chips. Whereas a similar prior computer program was capable of transmitting data to only one chip at a time, this program can send data to four chips simultaneously. This program is in the form of C-language code that can be compiled and linked into an adaptive-optics software system. The program as supplied includes source code for integration into the adaptive-optics software, documentation, and a component that provides a demonstration of loading DAC codes from a text file. On a standard Windows desktop computer, the software can update 128 channels in 10 ms. On Real-Time Linux with a digital I/O card, the software can update 1024 channels (8 boards in parallel) every 8 ms.

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

The software used in this innovation is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-43107.