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 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

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 Shanthi 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.