GUI, the user examines a number of links and returns decisions (yes, these are links; no, these are not links). Coded in XML, these decisions are provided to a "feedback processor" component that prepares the data for the next application of the IR technique. The feedback reduces the incidence of erroneous candidate links. Unlike related prior software, RETRO does not require the user to assign keywords, and automatically builds a document index.

*This program was developed by Jane Hayes, Alex Dekhtyar, Senthil Sundaram, and Sravanthi Vadlamudi of the University of Kentucky for* **Goddard Space Flight Center**. *Further information is contained in a TSP (see page 1).*
*GSC-14976-1.*

## ⟩ Automated Synthesis of Architectures of Avionic Systems

The Architecture Synthesis Tool (AST) is software that automatically synthesizes software and hardware architectures of avionic systems. The AST is expected to be most helpful during initial formulation of an avionic-system design, when system requirements change frequently and manual modification of architecture is time-consuming and susceptible to error. The AST comprises two parts: (1) an architecture generator, which utilizes a genetic algorithm to create a multitude of architectures; and (2) a functionality evaluator, which analyzes the architectures for viability, rejecting most of the non-viable ones. The functionality evaluator gener-

ates and uses a viability tree — a hierarchy representing functions and components that perform the functions such that the system as a whole performs system-level functions representing the requirements for the system as specified by a user. Architectures that survive the functionality evaluator are further evaluated by the selection process of the genetic algorithm. Architectures found to be most promising to satisfy the user's requirements and to perform optimally are selected as parents to the next generation of architectures. The foregoing process is iterated as many times as the user desires. The final output is one or a few viable architectures that satisfy the user's requirements.

*This program was written by Savio Chau, Joseph Xu, Van Dang, and James F. Lu 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-42607.*

## ⟩ SSRL Emergency Response Shore Tool

The SSRL Emergency Response Shore Tool (wherein "SSRL" signifies "Smart Systems Research Laboratory") is a computer program within a system of communication and mobile-computing software and hardware being developed to increase the situational awareness of first responders at building collapses. This program is intended for use mainly

in planning and constructing shores to stabilize partially collapsed structures. The program consists of client and server components, runs in the Windows operating system on commercial off-the-shelf portable computers, and can utilize such additional hardware as digital cameras and Global Positioning System devices.

A first responder can enter directly, into a portable computer running this program, the dimensions of a required shore. The shore dimensions, plus an optional digital photograph of the shore site, can then be uploaded via a wireless network to a server. Once on the server, the shore report is time-stamped and made available on similarly equipped portable computers carried by other first responders, including shore wood cutters and an incident commander. The staff in a command center can use the shore reports and photographs to monitor progress and to consult with structural engineers to assess whether a building is in imminent danger of further collapse.

*This program was written by Robert W. Mah, Richard Papasin, Dawn M. McIntosh, Douglas Denham, and Charles Jorgensen of* **Ames Research Center***; Bradley J. Betts of Computer Sciences Corporation; and Rommel Del Mundo of QSS Group, Inc. Further information is contained in a TSP (see page 1).*

*This invention is owned by NASA and a patent application has been filed. Inquiries concerning rights for the commercial use of this invention should be addressed to the Ames Technology Partnerships Division at (650) 604-2954. Refer to ARC-15461-1.*