Software

BGen: A UML Behavior Network Generator Tool

BGen software was designed for auto-generation of code based on a graphical representation of a behavior network used for controlling automatic vehicles. A common format used for describing a behavior network, such as that used in the JPL-developed behavior-based control system, CARACaS ["Control Architecture for Robotic Agent Command and Sensing" (NPO-43635), *NASA Tech Briefs*, Vol. 32, No. 10 (October 2008), page 40] includes a graph with sensory inputs flowing through the behaviors in order to generate the signals for the actuators that drive and steer the vehicle.

A computer program to translate Unified Modeling Language (UML) Free-form Implementation Diagrams into a legacy C implementation of Behavior Network has been developed in order to simplify the development of C-code for behavior-based control systems. UML is a popular standard developed by the Object Management Group (OMG) to model software architectures graphically. The C implementation of a Behavior Network is functioning as a decision tree.

This work was done by Leonard J. Reder, Terrance L. Huntsberger, and Harry Balian 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 Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-46787.

Platform for Post-Processing Waveform-Based NDE

Signal- and image-processing methods are commonly needed to extract information from the waves, improve resolution of, and highlight defects in an image. Since some similarity exists for all waveform-based nondestructive evaluation (NDE) methods, it would seem that a common software platform containing multiple signal- and image-processing techniques to process the waveforms and images makes sense where multiple techniques, scientists, engineers, and organizations are involved.

NDE Wave & Image Processor Version 2.0 software provides a single, integrated signal- and image-processing and analysis environment for total NDE data processing and analysis. It brings some of the most useful algorithms developed for NDE over the past 20 years into a commercial-grade product. The software can import signal/spectroscopic data, image data, and image series data.

This software offers the user hundreds of basic and advanced signal- and image-processing capabilities including esoteric 1D and 2D wavelet-based de-noising, de-trending, and filtering. Batch processing is included for signal- and image-processing capability so that an optimized sequence of processing operations can be applied to entire folders of signals, spectra, and images. Additionally, an extensive interactive model-based curve-fitting facility has been included to allow fitting of spectroscopy data such as from Raman spectroscopy. An extensive joint-time frequency module is included for analysis of non-stationary or transient data such as that from acoustic emission, vibration, or earthquake data.

This work was done by Don J. Roth of Glenn Research Center. Further information is contained in a TSP (see page 1). Inquiries concerning rights for the commercial use of this invention should be addressed to NASA Glenn Research Center, Innovative Partnerships Office, Attn: Steve Fedor, Mail Stop 4–8, 21000 Brookpark Road, Cleveland, Ohio 44135. Refer to LEW-18460-1.