VERILOG

VERILOG is integrating the ObjectGEODE product into the RASSP design environment. ObjectGEODE will be used to design, simulate and implement the event-driven command and control part of a typical system including DSPs, and extended by creating interface to other tools.

Focus on RASSP

A typical large scale architecture consists of a signal processing system communicating with a command and control system. The signal processing system performs the high-bandwidth number crunching and typically executes on DSPs. The signal processing system is modeled using the data-flow paradigm, while the command program is often represented by a finite state machine.

The command program is intimately related to the signal processing system, but it is frequently conceptualized as part of the command and control system. The command program is an interface between the signal processing system and the rest of the command and control system. It translates system-derived or user inputs into commands understood by the signal processing system and forwards signal processing system results.

VERILOG's ObjectGEODE product provides a graphical designing and efficient C/C++ autocoding capability, targeting popular real-time operating systems and network protocols, for the command and control portion of a distributed signal processing software application. ObjectGEODE excels at representing and autocoding event-driven, multi-tasking, distributed architectures and finite state machines and thus serves as a
Rapid Prototyping of Application-Specific Signal Processors

The RASSP virtual prototyping concepts are implemented via ObjectGEODE’s extensive simulation capabilities.

ObjectGEODE supports a coherent integration of complementary object-oriented approaches based on standards:

- Rumbaugh’s OMT. OMT is used to provide a high-level view - name, attributes, relationships - of the system and objects interfering with it.
- ITU-T’s SDL (Specification and Description Language). SDL is used to describe the architecture of the complete systems - DSP and Controller - and the detailed behavior of the Controller part.
- ITU-T’s MSC (Message Sequence Chart). MSC are used to describe the message exchange scenarios between the command and control and the DSP sub-systems.
- ISO’s ASN.1 (Abstract Syntax Notation One). ASN.1 is used to describe implementation-independent data structure.

The ObjectGEODE tool suite includes:

- Various editors that provide for intuitive means of creating, modifying, and viewing the multiple diagrams of an ObjectGEODE description
- A powerful simulation and formal verification and validation tool is provided to graphically detect before coding start, any pathological behavior pattern or show proof that the ObjectGEODE description complies with requirements.
- Fully executable C and C++ code of the (distributed) multi-task, multi-thread real-time application is automatically generated. Makefiles are also generated to automate the building process. The generated code maps a large command and control system to a DSP sub-system.

ObjectGEODE is a tool suite dedicated to analysis, design, verification and validation through simulation, code generation and testing of real-time and distributed applications. ObjectGEODE supports a coherent integration of complementary object-oriented approaches based on standards:

A Typical Large Scale Architecture.

ObjectGEODE architecture diagram.
set of COTS RTOS and network protocols such as TCP/IP via a dedicated **ObjectGEODE Run-Time Library**

- The DesignTracer allows the current SDL design description to be visualized interactively and trace information (including time) to be displayed as MSC diagrams.
- Test sequences can be generated in ISO TTCN format.

In RASSP, VERILOG will extend **ObjectGEODE** to include:

- Improved message communication description between the command and control and the DSP-based sub-system.
- Network-distributed simulation, and co-simulation between simulated design and generated code.
- Capabilities to describe hierarchical state machine using extensions to the ITU-T's SDL standard.

These extensions will be added to the **ObjectGEODE** product releases end of 1997 and during 1998.

The tool suite runs on SUN, HP, IBM RS/6000, and Windows NT.

**For More Information**

Kristi Herbst  
(972) 241-6595  
info@verilogusa.com  
www.verilogusa.com