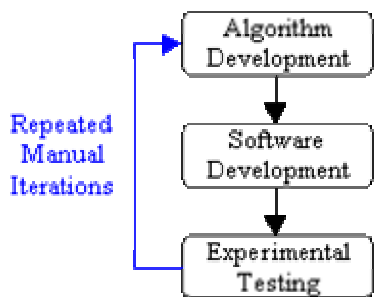


# DSP System Development

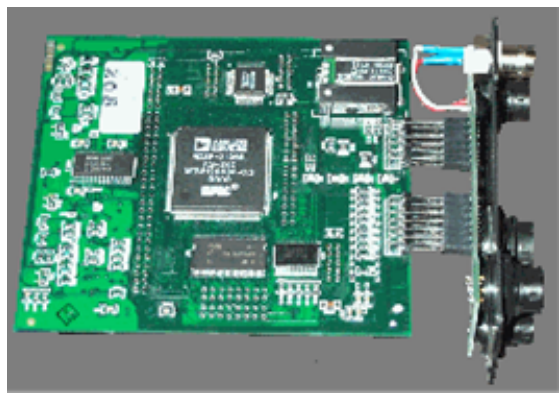
**Problem:** DSP-based systems take an unduly long time to develop, with the bulk of the time wasted in converting the algorithm to C-code.

The design of a signal processing system can involve many iterations. An algorithm is developed, which must then be coded and experimentally tested. The results of this testing are then used to refine the algorithm which typically requires more coding, and the process is repeated. This method of design can result in many hours of tedious code-writing, greatly lengthening the process. By automating the software-coding process and integrating experimental testing, control system designs can be completed in a fraction of the time traditionally required.



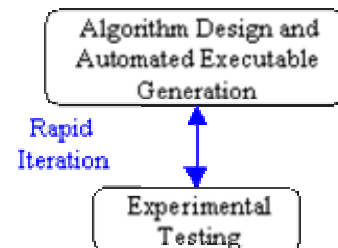
**Traditional Design Process**

To facilitate experimental testing and verification of the algorithm, an "external-mode" interface to Simulink is also designed. This allows the user to log data from the model, as well as to modify critical parameter values on the fly, while using Simulink as a graphical front-end to the real-time execution. A method of modifying parameters and logging data for pre-built models, separate from the MATLAB / Simulink software package, is currently in development. SDL is actively developing support for additional processor families.



**An Analog Devices SHARC Processor**

Making use of the automated code generation capabilities of MATLAB®'s Real-Time Workshop® package, SDL has designed interfaces for a number of DSP chips, including the TI C31, C44, and C6x processor families and Analog Devices SHARC® processor families. This allows algorithms to be designed as Simulink® block diagrams, and then be built into fully-commented DSP code with a single mouse click. Code is automatically compiled, optimized, linked, and downloaded to the target processor.



**Improved Design Process**

**Solution:** Design an integrated algorithm development environment for a number of DSP targets that automates the generation of C code from block diagrams and facilitates real-time hardware testing. The control system designer no longer has to deal with C code.

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# SDL

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