Catalytic COMPILERS

ML QUANTIZER

CONVERT A MATLAB™ PROGRAM TO FIXED-POINT WITH A CLICK OF YOUR MOUSE

- **Automatically performs the tedious aspects of converting MATLAB programs to fixed-point.**

- **Explores the effects of different quantizations without changing source code.**

- **Changes the precision of the entire program or a single variable with a single mouse click.**

- **Allows users to focus on individual functions using checkpointing facilities.**

- **Uses MATLAB to compute and display quantization error for given quantizations and input data.**

- **Quantize designs in hours, not days.**

The Catalytic Compilers ML Quantizer™ is an intelligent assistant that aids in making, exploring, and verifying fixed-point MATLAB programs. Converting a floating point MATLAB program into fixed point is never easy. While the Catalytic Compilers FxP Toolbox™ makes the conversion process proper simple, it does not test and verify the changes. Testing and verification are essential, particularly since MATLAB has few facilities for reporting data types. The ML Quantizer helps you verify that the changes you make are in fact the ones you want.

The ML Quantizer enables you to explore the effects of quantization parameters such as word-size, signedness, bits of precision to the right of the decimal, scaling, rounding, and arithmetic mode without changing your original floating point source code. Using only your mouse, you set the fixed-point parameters at as coarse a level as an entire function or as fine a level as individual variables. The ML Quantizer then automatically tests that characterization for you. When you're satisfied with the

results, one more mouse click causes the ML Quantizer to create a new quantized version of your source code — a version which the ML Quantizer has already fully tested.

If you know the minimum tolerable error for key variables in your program, you can instruct the ML Quantizer to find the minimal quantization that meets that bound. It will automatically run your input data for all characterizations that you request and report back the best fit for your requirements.

The ML Quantizer's checkpointing facilities enable you to save the state on entering a function, letting you test changes to the function without rerunning the entire simulation.

Tasks that the ML Quantizer automates include:

- Inserting necessary code to convert variables, functions, or programs to fixed point.
- Varying fixed-point parameters and reporting back effects on variables.
- Finding minimal quantizations that meet required error bounds.
- Testing different quantizations against specific input data.
- Checkpointing state to allow investigation of individual functions.

Typical user errors detected and corrected by the ML Quantizer include:

- Unquantized variables.
- Sources of overflow, underflow, and negative variables converted to unsigned.
- Non-compilable programs.
- Variables quantized differently than expected.
- Use of complex variables where real are sufficient.

The ML Quantizer takes care of the tedious time-consuming aspects of program quantization, giving you the time to focus on getting the best algorithms, planning your next project, or improving your golf swing.

For more information about how we can catalyze your design, send email to info@catacomp.com

www.catalyticcompilers.com
1900 Embarcadero Road
Suite 206
Palo Alto, CA 94303
Fax: 650.846.2557
Tel: 650.846.2555