

AGILITY RMS: RAPID MATLAB SIMULATOR

ACCELERATED MATLAB ALGORITHM EXECUTION

The increasing complexity of signal processing algorithms drives the need for faster simulation for validation. Agility RMS automatically compiles users MATLAB® into an accelerated Mex-file delivering compiled code performance seamlessly within the MATLAB environment.

Agility RMS accelerates algorithms written in M-code. The accelerated simulation speed approaches the simulation speed of hand-coded C but is automatically generated from the source MATLAB.

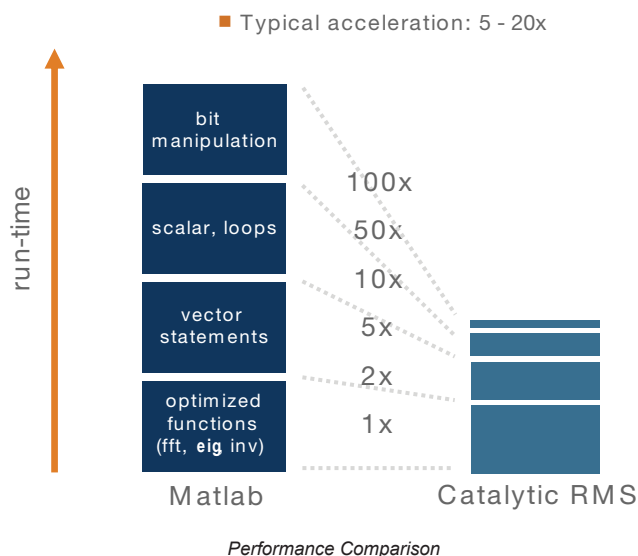
Agility RMS (Rapid MATLAB Simulator) features fast simulation of MATLAB code and fixed-point analysis tools for quantization and datapath optimization.

BLAZING FAST SIMULATION

Agility RMS converts M-code functions into a compiled library that uses the MATLAB standard MEX interface. This library produces results identical to the original algorithm, but executes much faster. Agility RMS is integrated seamlessly within MATLAB.

Agility RMS uses proprietary, state-of-the-art compilation technology, including interprocedural analysis and optimizations, type inferencing and advanced loop and dependence analysis. The result: faster execution of MATLAB algorithms.

Because MATLAB does use compiled code for some critical functions like FFT, the performance gain RMS will provide is variable. The graph below gives some guidelines for levels of acceleration for different styles of MATLAB code.



KEY FEATURES

- 5-20x acceleration of MATLAB code
- Seamlessly integrates into MATLAB environment
- Analysis tools ease quantization

REQUIRED PRODUCTS

- MATLAB R14 or newer

SUPPORTED PRODUCTS

- MATLAB Communications Toolbox
- MATLAB Signal Processing Toolbox
- MATLAB Image Processing Toolbox

OPERATING SYSTEMS

- Microsoft Windows (2000 or XP)
- 32 or 64-bit Linux (Red Hat Enterprise version 3 or 4)

COMPLEMENTARY PRODUCTS

- Agility MCS (Matlab to C Synthesis)



In addition a table of example acceleration factors for some common signal processing applications is shown.

Algorithm	Speed Up
Motion Estimation	25x
Read Channel	9x
CDMA 2000	5x
802.11n	12x
VDSL	30x

Acceleration Table

BROAD MATLAB SUPPORT

Agility MCS supports a large subset of the MATLAB language, including many of the commonly used features for modeling signal processing systems:

- Operators: arithmetic, matrix, logical, and bitwise operators
- Data types: real/complex, logical, structures
- Shapes: scalars, vectors, matrices, n-dimensional arrays
- Persistent and global variables
- Flow control constructs: if-then-else, for loops, while loops, switch
- Common mathematical functions (e.g. sqrt, sin, atan)
- Numerous built-in functions
- Many plotting functions
- Most of the Signal Processing and Communications toolboxes and Image Processing toolbox.

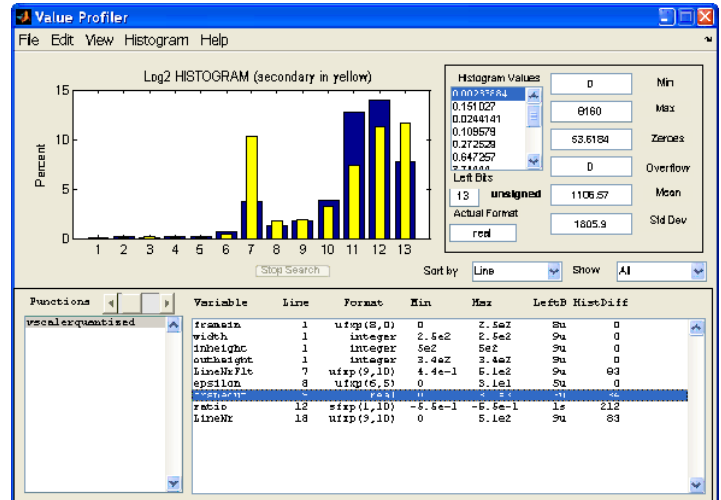
ADDITIONAL BENEFITS FOR FIXED-POINT DESIGNS

Without Agility fast simulation technology, simulation of fixed-point algorithms can be unacceptably long. As a result, developers usually do not quantize their design until they have migrated out of the MATLAB environment.

In addition to blazing fast simulation, the Agility RMS analysis tools dramatically ease the quantization process. These fixed-point analysis tools:

- Display the types of all variables in a MATLAB design
- Recommend quantization based on simulation runs flag overflows and other potential quantization errors

With Agility RMS, developers can now quantize MATLAB designs and run full system simulations inside the MATLAB environment. Developers can continue to use the MATLAB development environment to develop, optimize, and verify their MATLAB algorithms.



Agility Value Profiler



Algorithm to Implementation. *Fast.*

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