

Simulation and Real-Time Verification of Video Algorithms on the TI C6400 Using Simulink

Dr. Donald P. Orofino
The MathWorks, Inc
3 Apple Hill Drive
Natick, MA 01760
Phone: 508.647.7568
Fax: 508.647.7201
Email: don@mathworks.com

Abstract

This talk will show how the use of system-level design tools, such as MATLAB and Simulink, can greatly enhance an engineer's ability to quickly and effectively translate product-level and algorithm-level specifications into a working TI DSP-based prototype for the consumer electronics market. Specifically, we will show how to efficiently target typical video processing algorithms, with the high bandwidth and algorithmic efficiency they require, to the TI C6400 platform, and the value of utilizing simulation test-benches to verify real-time behavior of the final system using TI's High-speed RTDX capability. Both the TI C6416 DSK and the XDS-560 Emulator are demonstrated.

Presentation Structure:

Strength of system-level design (SLD) approach for consumer electronics
Problems in code generation and verification that SLD software can help solve
Introduction to the application of video processing, theory of algorithm design
- algorithm will either be "motion and edge detection" or "iris scan recognition", depending on how lucky we feel for the live demos ;-)

Implementation Details

- Live use of Simulink system-level design software
Automatic code generation, hardware task performance
- Live demonstration of C6400 DSK code generation using MathWorks
- Real-Time Workshop, optimization and real-time execution Design verification and real-time testbenching
- Live demonstration of real-time video data transfer and test-bench verification using RTDX and MATLAB Link for TI DSP

Conclusion

- Vision for future support of video and TI processor family