



Fall 2009 CIS Colloquium Series

SPIRAL and Beyond: Automatic Derivation and Optimization of DSP Algorithms and More

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11am-12pm, Wednesday, December 2
4th Floor Conference Room (Wachman Hall, CC 447)

Abstract: The SPIRAL system (www.spiral.net) is a tool for automatically deriving, implementing and optimizing digital signal processing (DSP) algorithms, in particular fast transform algorithms such as the fast Fourier transform (FFT). SPIRAL is capable of generating optimized implementations on a variety of platforms including SSE, multicore, Cell, GPU, distributed memory parallel processors, and FPGA, and has produced some of the fastest implementations of these algorithms on these platforms (SPIRAL is used by Intel in the implementation of their MKL and IPP libraries). SPIRAL uses a domain specific language, based on an algebraic formulation of DSP algorithms, and rewrite rules to generate a large number of implementations and uses intelligent search to find fast implementations. This talk provides an overview of the SPIRAL system, and presents new directions under investigation by the SPIRAL team.

Bio: Jeremy Johnson is Professor and Department Head for Computer Science at Drexel University. He received his Ph.D. from The Ohio State University under the direction of George Collins. His research interests include computer algebra algorithms and systems, high performance computing, domain specific languages and code generation, and automatic performance tuning. He is a founding member of the SPIRAL project and currently serves as chair of the ACM special interest group in symbolic and algebraic manipulation (SIGSAM).

Refreshments will be served!