Compiler Tools and Techniques for MATLAB

Laurie Hendren

School of Computer Science
McGill University
Montreal, Quebec, Canada

Date: August 31, 2015
Time: 2:00 – 3:15 p.m.
Location: McBryde Hall 655

Abstract

Over the years many excellent optimizing compiler techniques and infrastructures have been developed for programming languages used by computer scientists. For example, my group at McGill spent many years developing the Soot framework for Java, and this work has been continued by many other research groups.

During the last five years, my research group has tackled a new problem, developing compiler tools and techniques for dynamic array-based languages like MATLAB, which are used predominately by scientists, engineers and students. In this talk, I will outline our experiences in this project, highlighting the challenges that we encountered and the solutions that we have found. In particular, I will provide an overview of our McLAB toolkit, including our approach to static compilation, JIT-compilation, compiling for GPUs, and our new aspect-oriented extension called AspectMatlab.

Speaker's Biography

Professor Laurie Hendren leads the Sable Research Group at McGill University. She received her B.Sc. and M.Sc. degrees from Queen's University, Canada and her Ph.D. from Cornell. She has been a professor at McGill since 1990, was made an ACM Fellow in 2010, was awarded a Canada Research Chair in Compiler Tools and Techniques in 2011, and was made a Fellow of the Royal Society of Canada in 2012. The Sable Research Group has previously designed and implemented Soot and associated tools for the analysis and transformation of Java. For the last five years, the group has been developing McLAB, a framework for compiling and executing MATLAB and extensions of MATLAB. In addition, she is currently part of a multi-disciplinary team developing domain-specific languages and tools for patients and physicians in radiation oncology.