# James Jablin

**Graduate Institution:** Brown University

**Graduate Discipline:** Computer Science

**Hometown:** Chambersburg, PA

**Relevant SC Research:** Advanced Scientific Computing Research

## Research Interest:

My research involves the research and implementation of program optimization and parallelization for executing applications across heterogeneous systems composed of CPUs and GPUs. A hybrid approach, exploring potential synergies of these architectures, reveals performance benefits not apparent from each architecture alone; each architecture executes a set of subtasks of the application suited to its unique characteristics, thereby improving resource utilization and performance. This work benefits all types of scientific applications wishing to achieve higher performance results on heterogeneous systems.

Additionally, automatic optimization carries other significant advantages. Presently, writing parallel programs requires the expertise of elite programmers, a group too few to write tomorrow's applications or retrofit those of yesterday. I am very excited about my current research adding automatic software support for speculation on GPUs to increase instruction-level parallelism (ILP).

## About Me:

I am currently a fifth year Ph.D. student in the Computer Science Department at Brown University. My advisor is Professor Maurice Herlihy. I hope to graduate toward the end of 2013. In May 2012, I proposed my thesis on automatic GPU control speculation to improve GPU program performance. While GPUs have vast performance potential, current GPU programming paradigms are laborious to learn and apply. The intent of my thesis research is to assuage GPU programmer burden by automatically improving GPU program performance, reaping the benefits of the GPU's high-performance without any manual programmer effort.

I had two exciting research opportunities before graduate school. In Summer 2007 I worked with Professor David August's Liberty Group at Princeton University and continued my Liberty Group work from Haverford College through Fall 2007. During the summer between college and graduate school, I worked at Reservoir Labs, Inc., a small startup company based in New York City. I worked with the R-Stream optimizing compiler development team.

Much of my graduate career I have spent at Los Alamos National Laboratory: Summer 2009, Summer 2010 – Fall 2011. At the lab I work with Pat McCormick in CCS-7: Applied Computer Science. CCS-7 develops system software and tools for scientific applications at extreme scale. Specifically, I worked on Scout, a parallel programming language and extensible compiler framework targeting heterogeneous architectures.

I have served on the grant committees for the Department of Energy Small Business Innovation Research (SBIR) Phase I & II Programming Challenges Review Panel in February 2011 and May 2012.

Previously, in 2008 I earned my bachelor's degree in Computer Science from Haverford College in Haverford, PA. While in college I participated on the college's Cross Country/Track and Field Team. In Cross Country I was named to the All-Mideast Regional Team 2005 - 2007 and at Division III Cross Country Nationals the team took third, tenth, and second places for the same years. In Spring 2007 I won an Academic All-American Award in outdoor Track and Field in recognition of academic excellence and provisionally qualifying for Nationals in the 10,000m race.

After I graduate, I am interested in pursuing a post-doctoral position at a national laboratory or alternatively, an industry position working in research and development or consulting.

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