15-745 Optimizing Compilers, Spring 2011
Papers for In-Class Discussions

Optimizations for Dynamic Languages

- Andreas Gal, Brendan Eich, Mike Shaver, David Anderson, David Mandelin, Mohammad R. Haghighat, Blake Kaplan, Graydon Hoare, Boris Zbarsky, Jason Orendorff, Jesse Ruderman, Edwin Smith, Rick Reitmaier, Michael Bebenita, Mason Chang, and Michael Franz. *"Trace-based just-in-time type specialization for dynamic languages,"* in *Proceedings of the 2009 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2009.

- Kevin Williams, Jason McCandless, and David Gregg. *"Dynamic interpretation for dynamic scripting languages,"* in *Proceedings of the 8th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2010.

- Gregor Richards, Sylvain Lebresne, Brian Burg, and Jan Vitek. *" An analysis of the dynamic behavior of JavaScript programs,"* in *Proceedings of the 2010 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2010.

Dynamic Code Optimization

- John Cuthbertson, Sandhya Viswanathan, Konstantin Bobrovsky, Alexander Astapchuk, Eric Kaczmarek and Uma Srinivasan. *" A Practical Approach to Hardware Performance Monitoring Based Dynamic Optimizations in a Production JVM,"* in in *Proceedings of the 7th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, March 2009.

- Jason Mars and Robert Hundt. *"Scenario Based Optimization: A Framework for Statically Enabling Online Optimizations,"* in *Proceedings of the 7th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, March 2009.

- Dayong Gu and Clark Verbrugge. *"Phase-based adaptive recompilation in a JVM,"* in in *Proceedings of the 6th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2008.

Profile-Directed Optimization

- Xiangyu Zhang, Armand Navabi, and Suresh Jagannathan. *"Alchemist: A Transparent Dependence Distance Profiling Infrastructure,"* in *Proceedings of the 7th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, March 2009.

- Paul Berube, Jose Nelson Amaral, Rayson Ho, and Raul Silvera. *"Workload Reduction for Multi-input Feedback-Directed Optimization,"* in *Proceedings of the 7th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, March 2009.

- Subhajit Roy and Y. N. Srikant. *"Profiling k-Iteration Paths: A Generalization of the Ball-Larus Profiling Algorithm,"* in *Proceedings of the 7th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, March 2009.

- John Cavazos, Grigori Fursin, Felix Agakov, Edwin Bonilla, Michael F. P. O'Boyle, and Olivier Temam. *"Rapidly Selecting Good Compiler Optimizations using Performance Counters,"* in *Proceedings of the 2007 International Symposium on Code Generation and Optimization (CGO)*, March 2007.

Information Flow and Security

- Ravi Chugh, Jeffrey A. Meister, Ranjit Jhala, and Sorin Lerner. " *Staged information flow for javascript,*" in *Proceedings of the 2009 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2009.

- Indrajit Roy, Donald E. Porter, Michael D. Bond, Kathryn S. McKinley, and Emmett Witchel. *"Laminar: practical fine-grained decentralized information flow control,"* in *Proceedings of the 2009 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2009.

- Benjamin Livshits, Aditya Nori, Sriram Rajamani, and Anindya Banerjee. *"Merlin: specification inference for explicit information flow problems,"* in *Proceedings of the 2009 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2009.

- Omer Tripp, Marco Pistoia, Stephen Fink, Manu Sridharan, and Omri Weisman. *"TAJ: effective taint analysis of web applications,"* in *Proceedings of the 2009 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2009.

Pointer Analysis

- Hongtao Yu, Zhaoqing Zhang, Xiaobing Feng, Wei Huo and Jingling Xue. *"Level by Level: Making Flow- and Context-Sensitive Pointer Analysis Scalable for Millions of Lines of Code,"* in *Proceedings of the 8th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2010.

- Fernando Quintao Pereira and Daniel Berlin. *"Wave Propagation and Deep Propagation for Pointer Analysis,"* in *Proceedings of the 7th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, March 2009.

- Vineet Kahlon. *"Bootstrapping: a technique for scalable flow and context-sensitive pointer alias analysis,"* in *Proceedings of the 2008 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2008.

Software Pipelining

- Sebastian Winkel, Rakesh Krishnaiyer, and Robyn Sampson. *"Latency-tolerant software pipelining in a production compiler,"* in *Proceedings of the 6th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2008.

- Easwaran Raman, Guilherme Ottoni, Arun Raman, Matthew Bridges, and David I August. *"Parallel-stage decoupled software pipelining,"* in *Proceedings of the 6th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2008.

- Kevin Fan, Hyunchul Park, and Scott Mahlke. *"Modulo scheduling for highly customized datapaths to increase hardware reusability,"* in *Proceedings of the 6th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2008.

Optimizing Streams

- Abhishek Udupa, R. Govindarajan, and Matthew J. Thazhuthaveetil. *"Software Pipelined Execution of Stream Programs on GPUs,"* in *Proceedings of the 7th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, March 2009.

- Yoonseo Choi, Yuan Lin, Nathan Chong, Scott Mahlke, and Trevor Mudge. *"Stream Compilation for Real-Time Embedded Multicore Systems,"* in *Proceedings of the 7th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, March 2009.

Compiling for GPUs

- Yi Yang, Ping Xiang, Jingfei Kong, and Huiyang Zhou. *"A GPGPU compiler for memory optimization and parallelism management,"* in *Proceedings of the 2010 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2010.

- Shane Ryoo, Christopher I.Rodrigues, Sara S. Baghsorkhi, Sam S. Stone, Sain-Zee Ueng, John A. Stratton, and Wen-mei W. Hwu. *"Program optimization space pruning for a multithreaded gpu,"* in *Proceedings of the 6th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2008.

Register Allocation

- Ivan D. Baev. *"Techniques for Region-Based Register Allocation,"* in *Proceedings of the 7th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, March 2009.

- Rei Odaira, Takuya Nakaike, Tatsushi Inagaki, Hideaki Komatsu, and Toshio Nakatani. *"Coloring-based coalescing for graph coloring register allocation,"* in *Proceedings of the 8th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2010.

- Hongbo Rong. *"Tree register allocation,"* in *Proceedings of the 42nd Annual IEEE/ACM International Symposium on Microarchitecture (Micro)*, December 2009.

- Fernando Magno Quinto Pereira and Jens Palsberg. *"Register allocation by puzzle solving,"* in *Proceedings of the 2008 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2008.

- Sebastian Hack. *"Copy coalescing by graph recoloring,"* in *Proceedings of the 2008 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2008.

Cache Optimizations

- Tomofumi Yuki, Lakshminarayanan Renganarayanan, Sanjay Rajopadhye, Charles Anderson, Alexandre Eichenberger and Kevin O'Brien. *"Automatic creation of tile size selection models,"* in *Proceedings of the 8th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2010.

- Muthu Manikandan Baskaran, Albert Hartono, Sanket Tavarageri, Tom Henretty, J Ramanujam, and P Sadayappan. *"Parameterized Tiling Revisited,"* in *Proceedings of the 8th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2010.

- Tong Chen, Tao Zhang, Zehra Sura, Kathryn O'Brien, Kevin O'Brien, and Marc Gonzalez Tallada. *"Prefetching Irregular References for Software Cache on Cell,"* in *Proceedings of the 6th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2008.

Machine Learning and Optimizations

- Hugh Leather, Edwin Bonilla, and Michael O'Boyle. *"Automatic Feature Generation for Machine Learning Based Optimizing Compilation,"* in *Proceedings of the 7th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, March 2009.

- Zheng Wang and Michael F.P. O'Boyle. *"Partitioning streaming parallelism for multi-cores: a machine learning based approach,"* in *Proceedings of the 19th International Conference on Parallel Architectures and Compilation Techniques (PACT)*, September 2010.

- Felix Agakov, Edwin Bonilla, John Cavazos, Bjoern Franke, Grigori Fursin, Michael O'Boyle, Marc Toussaint, John Thomson, and Chris Williams. *"Using Machine Learning to Focus Iterative Optimization,"* in *Proceedings of the 4th Annual International Symposium on Code Generation and Optimization (CGO)*, March 2006.

- Mark Stephenson and Saman Amarasinghe. *"Predicting Unroll Factors Using Supervised Classification,"* in *Proceedings of the 2005 International Symposium on Code Generation and Optimization (CGO)*, March 2005.

Mathematical/Statistical Approaches to Optimization

- Farhana Aleen and Nathan Clark. *"Commutativity analysis for software parallelization: letting program transformations see the big picture,"* in *Proceedings of the 14th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, March 2009.

- Michael D. Linderman, Matthew Ho, David L. Dill, Teresa H. Meng, and Garry P. Nolan. *"Towards program optimization through automated analysis of numerical precision,"* in *Proceedings of the 8th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, April 2010.

- Florian Loitsch. *"Printing floating-point numbers quickly and accurately with integers,"* in *Proceedings of the 2010 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2010.