

# DAVID RYAN KOES

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## Education

- Ph.D. **Carnegie Mellon University**, Pittsburgh, PA, Computer Science, *expected* Fall 2009.  
Dissertation: “Towards a More Principled Compiler: Progressive Backend Compiler Optimization,” supervised by Professor Goldstein.
- M.S. **Carnegie Mellon University**, Pittsburgh, PA, Computer Science, May 2006.
- B.S. **Carnegie Mellon University**, Pittsburgh, PA, Computer Science, 2001.  
Minor in Mathematics. University Honors. Senior Leadership Award.
- Dipl. **Potsdam High School**, Potsdam, NY, Regents Diploma, 1997.

## Awards

- Best Student Presentation**, Intl. Symposium on Code Generation and Optimization, April 2008.
- Honorable Mention Graduate Student Teaching Award**, Carnegie Mellon University, 2007–2008.
- Andrew Carnegie Society Presidential Scholar**, Carnegie Mellon University, 2001.

## Experience

- Graduate Student Researcher**, Carnegie Mellon University, Pittsburgh, PA, 2002–present.  
Research Assistant with Professor Goldstein. Developed novel and principled approaches to backend compiler optimization. Explored compilation for application specific hardware.
- Software Developer**, Green Hills Software, Santa Barbara, CA, 2001–2003.  
Lead developer of 68k/ColdFire compiler. Substantially improved quality of generated code.
- Consultant**, Intelligent Environments, Potsdam, NY, 2000.  
Developed symbolic math engine using Java.
- Developer**, CAISE Lab, Clarkson University, Potsdam, NY, 1996–1999.  
Developed web, multimedia, and C++ applications to aid in the teaching of introductory mechanical engineering concepts.

## Refereed Publications

- [1] “Register Allocation Deconstructed,” David Ryan Koes and Seth Copen Goldstein. In *Proceedings of the International Workshop on Software and Compilers for Embedded Systems (SCOPES '09)*. Nice, France, 2009
- [2] “Near-Optimal Instruction Selection on DAGs,” David Ryan Koes and Seth Copen Goldstein. In *Proceedings of the International Symposium on Code Generation and Optimization (CGO'08)*. Washington, DC, USA, 2008
- [3] “A Global Progressive Register Allocator,” David Ryan Koes and Seth Copen Goldstein. In *Proceedings of the 2006 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI'06)*. pages 204–215, New York, NY, 2006

- [4] “A Progressive Register Allocator for Irregular Architectures,” David Ryan Koes and Seth Copen Goldstein. In *Proceedings of the International Symposium on Code Generation and Optimization (CGO’05)*. pages 269–280, Washington, DC, March, 2005
- [5] “Programmer Specified Pointer Independence,” David Ryan Koes, Mihai Budiu, Girish Venkataramani, and Seth Copen Goldstein. In *Proceedings of the 2004 Workshop on Memory system performance (MSP)*. pages 51–59, Washington, D.C., June, 2004 Also appeared in *Carnegie Mellon University TR CMU-CS-03-123*
- [6] “Precise omnidirectional camera calibration,” Dennis Strelow, Jeffrey S. Mishler, David Koes, and Sanjiv Singh. *IEEE Computer Vision and Pattern Recognition*. pp. I-689-I-694 vol.1, 2001

### Refereed Posters

- [7] “Performance Metrics for Optimal Register Allocators,” In *PLDI Student Poster Session*. 2007
- [8] “A Better Global Progressive Allocator,” David Ryan Koes and Seth Copen Goldstein. In *LCTES Student Poster Session*. 2006

### Technical Reports

- [9] “An Analysis of Graph Coloring Register Allocation,” David Ryan Koes and Seth Copen Goldstein. *Carnegie Mellon University Technical Report No. CMU-CS-06-111*. March, 2006
- [10] “Adding Faster with Application Specific Early Termination,” David Ryan Koes, Tiberiu Chelcea, Charles Onyeama, and Seth Copen Goldstein. *Carnegie Mellon University Technical Report No. CMU-CS-05-101*. May, 2005

### Teaching

- 15-745: Optimizing Compilers for Modern Architectures. Teaching Assistant. Spring 2008.
- 15-411: Compiler Design. Assistant Lecturer. Fall 2006.
- 15-411: Compiler Design. Assistant Lecturer. Fall 2005.
- 15-745: Optimizing Compilers for Modern Architectures. Teaching Assistant. Fall 2003.
- 15-213: Introduction to Computer Systems. Teaching Assistant. Spring 2003.
- 15-213: Introduction to Computer Systems. Teaching Assistant. Spring 2001.
- 15-211: Fundamentals of Computer Science I. Teaching Assistant. Spring 2000.
- 15-211: Fundamentals of Computer Science I. Teaching Assistant. Fall 1999.
- 15-211: Fundamentals of Computer Science I. Teaching Assistant. Spring 1999.

### Professional Activities

Referee for PLDI, IEEE Transactions on Embedded Systems, IEEE Transactions on Computers  
 Member: ACM SIGARCH, ACM SIGPLAN, and IEEE Computer Society.

### Community Service

Maintainer of ILOG CPLEX software collection.