Sorin Lerner

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Research Interests

My research interests lie in programming language and analysis techniques for making software systems easier to write, maintain and understand, including static program analysis, domain specific languages, compilation, formal methods and theorem provers.

Education

Ph.D., Computer Science, University of Washington, Summer 2005, expected.
Thesis: Automated Soundness Proofs for Dataflow Analyses and Transformations.
Advisor: Professor Craig Chambers

M.S., Computer Science, University of Washington, December 2001.
Thesis: Combining Dataflow Analyses and Transformations.
Advisor: Professor Craig Chambers

B. Eng, Computer Engineering, McGill University, May 1999.

Awards

Best Paper Award, PLDI 2003.

Microsoft Graduate Fellowship, University of Washington, 2002-2004.

Governor General's Silver Medal, McGill University, 1999.

Research Experience

University of Washington **Seattle, WA**

Research Assistant for Professor Craig Chambers, Fall 2000 – present.

- Designed a language for expressing dataflow analyses and program transformations that can be checked for correctness automatically [*PLDI 2003*, *POPL 2005*].
- Designed and implemented a technique for expressing dataflow analyses modularly while still allowing them to interact in mutually beneficial ways [*POPL 2002*].

Microsoft Research **Redmond, WA**

Research Intern for Manuvir Das, Summer 2001.

- Co-designed and implemented an algorithm for detecting API-usage-rule violations in large C and C++ programs [*PLDI 2002*].

Research Intern for Ronnie Chaiken and David Gillies, Summer 2000.

- Co-designed and co-implemented a run-time dynamic optimizer for x86 binaries [*FDDO 2000*].

Teaching and Advising Experience

University of Washington **Seattle, WA**

Mentor for Erika Rice, a first year graduate student on the Rhodium project, Summer 2004 – present.
Lecturer for 2 weeks, CSE-501, Ph.D.-level Program Analysis, Winter 2003.
Teaching Assistant, CSE-501, Ph.D.-level Program Analysis, Winter 2001, Winter 2003, and Winter 2004.
Teaching Assistant, CSE-370, Digital Logic Design, Fall 1999, Winter 2000, and Spring 2000.

McGill University **Montreal, PQ**

Teaching Assistant, ECE 304-526, Ph.D.-level Artificial Intelligence, Winter 1999.
Teaching Assistant, ECE 304-427, Undergraduate Operating Systems, Fall 1998.

Industry Experience

Microsoft **Redmond, WA**

Software Design Engineer Intern in the C++ compiler back-end team, Summer 1999.
Software Design Engineer Intern in the COM+ services team, Summer 1998.

Bell Northern Research **Montreal, PQ**

Software Developer Intern in the speech recognition group, Summer 1996 and Summer 1997.

Publications

Sorin Lerner, Todd Millstein, Erika Rice, and Craig Chambers. "Automated Soundness Proofs for Dataflow Analyses and Transformations via Local Rules". In *Proceedings of the 32nd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages* (POPL 2005). Long Beach, California, January 2005.

Sorin Lerner, Todd Millstein, and Craig Chambers. "Automatically Proving the Correctness of Compiler Optimizations". In *Proceedings of the ACM SIGPLAN '03 Conference on Programming Language Design and Implementation* (PLDI 2003). San Diego, California, June 2003.

Stephen Adams, Thomas Ball, Manuvir Das, Sorin Lerner, Sriram K. Rajamani, Mark Seigle, and Westley Weimer. "Speeding Up Dataflow Analysis Using Flow-Insensitive Pointer Analysis". In *the 9th International Static Analysis Symposium* (SAS 2002). Madrid, Spain September 2002.

Manuvir Das, Sorin Lerner, Mark Seigle. "ESP: Path-Sensitive Program Verification in Polynomial Time". In *Proceedings of the ACM SIGPLAN '02 Conference on Programming Language Design and Implementation* (PLDI 2002). Berlin, Germany, June 2002.

Sorin Lerner, David Grove and Craig Chambers. "Combining Dataflow Analyses and Transformations" In *Proceedings of the 29th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages* (POPL 2002). Portland OR, January 2002.

Wen-Ke Chen, Sorin Lerner, Ronnie Chaiken and David Gillies. "Mojo: A Dynamic Optimization System". *3rd ACM Workshop on Feedback-Directed and Dynamic Optimization* (FDDO 2000). Monterey CA, Dec. 2000.

Presentations

"Automated Soundness Proofs for Dataflow Analyses and Transformations". POPL 2005.

"Better Compilers at Lower Cost". IBM T. J. Watson Research Center, November 2004.

"Automatically Proving the Correctness of Compiler Optimizations". PLDI 2003.

"Composing Dataflow Analyses and Transformations". POPL 2002.

"Mojo: A Dynamic Optimization System". Microsoft Research, September 2000.

Service

Reviewer: PLDI, OOPSLA, CC, CGO.

UW faculty recruiting liaison, 2002-2004.

UW CSE Ph.D. admissions committee, Winter 2003.

UW Prospective graduate student recruiting committee, 2001-2002.

Personal Information

Canadian citizen.

References

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