

LAURIE J. HENDREN

Personal Data

Date of Birth: December 13, 1958

Place of Birth: Peterborough, Ontario, Canada

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Education

- Ph.D.:
September 1985 to December 1989, M.S. granted August 1988, Ph.D. granted January 1990.
Department of Computer Science, Cornell University.
Ph.D. Thesis Title: Parallelizing Programs with Recursive Data Structures.
- M.Sc.:
September 1982 to February 1984, Department of Computing and Information Science, Queen's University at Kingston, Canada.
M.Sc. Thesis Title: ISON - An Introductory Subset of Nial.
- B.Sc. (Honours):
September 1977 to May 1982, Department of Computing and Information Science, Queen's University at Kingston, Canada.

Honours and Awards

- Canada Research Chair in Compiler Tools and Techniques, 2011.
- Leverhulme Visiting Professor, Oxford, 2010-2011 (sabbatical).
- Visiting Scholar, Wolfson College, Oxford, 2010-2011 (sabbatical).
- ACM Fellow, 2009.
- Leo Yaffe Award for Excellence in Teaching, Faculty of Science, McGill University, 2006.
- Sage Fellowship, Cornell University, 1985-86.
- Natural Sciences and Engineering Research Council of Canada, Postgraduate Scholarship, 1982-84.
- Departmental Medal in Computing and Information Science, Queen's University at Kingston, 1982.
- Entrance Scholarship, Queen's University at Kingston, 1977.

Academic and Research Positions

- September 2005 to August 2014:
Associate Dean (Academic), Faculty of Science, McGill University.
- December 2001 to present:
Professor, School of Computer Science, McGill University.
- June 1995 to November 2001:
Associate Professor, School of Computer Science, McGill University.
- July 1990 to May 1995:
Assistant Professor, School of Computer Science, McGill University.
- January 1990 to June 1990:
Research Associate (post-doctoral position), Department of Computing and Information Science, Queen's University.
- September 1987 to December 1989:
Research Assistant, Department of Computer Science, Cornell University.
- June 1986 to December 1986:
Research Assistant, Microflow Project, Department of Computer Science, Cornell University.

- May 1985 to September 1985:
Research Associate, Q'Nial Project, Department of Computing and Information Science, Queen's University at Kingston, Canada.
- June 1984 to May 1985:
Senior Programmer, Nial Systems Limited, Kingston, Canada.
- February 1982 February 1984:
Research Assistant, Q'Nial Project, Department of Computing and Information Science, Queen's University at Kingston, Canada.
- Summer 1981:
Research Assistant, Medical Engineering, Division of Electrical Engineering, National Research Council of Canada.

Research Grants

Note: In the following list the Principal Investigator is underlined.

- NSERC Canada Research Chair, Hendren, *Compiler Tools and Techniques*, \$64,000 per year research grant, 2011-2017.
- NSERC Discovery Grant, Hendren, *Languages, compilers and virtual machines for scientists*, \$43,000 per year, 2010-2015.
- Microsoft Award, Hendren, *Scientific programming languages and associated compiler tools*, \$5,000, 2008.
- NSERC Equipment Grant, Verbrugge and Hendren, *Refurbishment of Sable Lab*, 2006-07.
- NSERC Discovery Grant, Hendren, *Analysis and Optimization of Object-Oriented and Aspect-Oriented Programs*, \$64,000 per year, 2005-2010.
- FQNRT (FCAR) Team Grant, Hendren, Driesen and Verbrugge, *Understanding and Optimizing Object-Oriented and Concurrent Programs, Operating* (\$65,000 per year, 2003-2006), *Equipment* (\$33,000, 2003-2004).
- EPSRC Visiting Fellow, de Moor, *Compiler Tools and Techniques for Object-Oriented and Aspect-Oriented Programs*, 2003-3004.
- NSERC Research Grant, Hendren, *Compiler tools and techniques for analysis and optimization of Java*, \$52,000 per year, 2001-2005.
- IBM Faculty Partnership Award, Hendren, \$61,000 (\$40,000 US) per year, 2001-2004.
- IBM Scholars Program - Eclipse Innovation Grant, Hendren, \$33,000 (\$25,000 US), 2004.
- IBM Scholars Program - Eclipse Innovation Grant, Hendren, \$39,000 (\$25,000 US), 2003.

- NSERC Equipment Grant, Hendren, *Support for the Sable Group's Computing Lab, (File and Compute Servers)*. \$59,754, 2001-2002.
- FCAR Team Grant, Hendren, Panangaden and Debbabi, *The Design, Analysis and Implementation of Modern Concurrent Programming Languages*, \$42,000 per year (plus \$15,000 equipment), 1998-2001.
- NSERC Research Grant, Hendren, *The Design, Implementation and Application of Program Analyses and Transformations*, \$40,000 (1997-98, 1998-99), \$44,000 (1999-2000), \$46,200 (2000-2001), 1997-2001.
- NSERC Equipment Grant, Hendren, *Equipment to Support the Sable Java Compiling Group (Workstations)*, \$19,236, 1998-1999.
- NSERC Research Grant, Hendren, *Compiling for High-Performance Architectures*, \$29,000 per year, 1994-1997.
- FCAR Team Grant, Panangaden, Gao and Hendren, *Une approche unifiée pour le calcul en parallèle*, \$13,470 equipment, 1994-1995; \$28,500 per year, 1994-1997.
- NSERC Strategic Grant, Gao, Hendren, Hum and Panangaden, *A Multithreaded Approach to High-Performance Computing and its Implementation*, \$21,549 equipment, 1993-1994; \$110,000 per year operating, 1993-1997.
- NSERC Equipment Grant, Gao, Hendren, Panangaden, Avis and Tropper, *Distributed Computing*, \$45,811, 1996-97.
- NSERC Industrially-Oriented Research Grant (with Bell Northern Research), Hendren and Gao, *Compiling for Application Specific Instruction-Set Processors*, \$60,000, 1995-1996.
- NSERC Equipment Grant, Hendren, Gao and Panangaden, *File and Compute Servers*, \$29,414, 1994-1995.
- CRIM Industrial Research Grant, Hendren, *Portable Parallel Programming Environment*, approx. \$6,000 per year, 1993-1995.
- NSERC Equipment Grant, Gao, Hendren and Panangaden, *McCAT, McGill Compiler-Architecture Testbed*, \$28,000, 1992-1993.
- FCAR Team Grant, Panangaden, Gao and Hendren, *Architectural Models and Programming Principles for Parallel Processing*, \$22,520 per year, 1991-1994.
- FCAR Nouveau Chercheur, Hendren, *Compiling for Parallel Architectures*, \$8,432 equipment, 1991-1992; \$11,839 per year operating, 1991-1994.
- NSERC Operating Grant, Hendren, *Compiling for Parallel Architectures*, \$19,000 per year, 1991-1994.
- NSERC Equipment Grant, with Panangaden, Gao, ElGindy, Hendren, Merrett, Paige and Tropper, *16-processor upgrade for BBN Butterfly*, \$85,216, 1991-1992.
- McGill Equipment Grant, Hendren, \$8,000, 1990.

Publications

Importance of Conference Publications

My publication profile includes both journal and conference publications. In my field conference publications are very important and are taken very seriously by the research community. As this is somewhat unusual and sometimes misunderstood, a report was written for the National Academy Press and a summary of this report was published in an article entitled “Academic Careers for Experimental Computer Scientists and Engineers” published in the April 1994 issue of the Communications of the ACM. This report includes the following paragraph.

“The ECSE research community depends heavily on conferences to communicate knowledge, and conferences are widely regarded as the preferred medium for maximizing the effect of ECSE research. However, the tenure and promotion process at many universities does not give conference presentations and publications a weight appropriate to their significance in the field, preferring instead publications in archival journals.”

In fact, the top-notch conferences are highly competitive and papers presented at these conferences are reviewed and widely cited. The three most prestigious conferences relevant to my work are the ACM SIGPLAN sponsored conferences POPL (Principles of Programming Languages), PLDI (Programming Language Design and Implementation), and OOPSLA (Object Oriented Programming, Systems, Languages and Applications). It is very difficult to get papers accepted into these conferences. Serious researchers send only their best work to these conferences and typically the acceptance rate is about 20%. Papers are reviewed by three program committee members, and usually by at least one person outside the program committee. The papers appear in proceedings that are widely available in print form and through the ACM Digital Library. POPL, PLDI and OOPSLA papers are widely cited and form the core of the research literature in my field. We have had papers appearing in PLDI '92, PLDI '94 (two papers), POPL '96, POPL '98, PLDI '98, OOPSLA '00, OOPSLA '03, PLDI '03, PLDI '05, OOPSLA '04, PLDI '05, OOPSLA '05, OOPSLA '08, and OOPSLA '11.

Of course my group also publishes in wide variety of other excellent conferences. For example our recent work on aspect-oriented programming has appeared in the International Conference on Aspect-Oriented Software Development (AOSD). We have had papers at AOSD '11, AOSD '10, AOSD '08, AOSD '06 and AOSD '05. Other important conferences include the International Conference in Compiler Construction, where we publish regularly, and a variety of software engineering and program understanding conferences.

Journal Publications

1. Eric Bodden and Laurie Hendren, *The Clara Framework for Hybrid Typestate Analysis*, International Journal on Software Tools for Technology Transfer, pp. 1-20, 2010.
2. Eric Bodden, Laurie Hendren, Patrick Lam, Ondrej Lhotak and Nomair Naeem, *Collaborative Runtime Verification with Tracematches*, Journal of Logic and Computation, 20(3), pp 707-723, 2010.

3. Ondrej Lhotak and Laurie Hendren, *Evaluating the Benefits of Context-Sensitive Points-to Analysis using a BDD-based Implementation*, ACM Transactions on Software Engineering and Methodology, Vol. 18., No. 1, pp. 1-53, 2008.
4. Ondrej Lhotak and Laurie Hendren, *Relations as an abstraction for BDD-based program analysis*, ACM Transactions on Programming Languages and Systems, Vol. 30, No. 4, pp. 1-63, 2008.
5. Pavel Avgustinov, Aske Simon Christensen, Laurie Hendren, Sascha Kuzins, Jennifer Lhotak, Ondrej Lhotak, Oege de Moor, Damien Sereni, Ganesh Sittampalam and Julian Tibble, *abc: An Extensible AspectJ compiler*, Transactions on Aspect-Oriented Software Development, Volume 1, pp. 293-334, March 2006.
6. Ondrej Lhotak and Laurie Hendren, *Run-time evaluation of opportunities for object inlining in Java*, Concurrency and Computation: Practice and Experience, Vol. 17, Issue 5-6, pp. 515-537, April-May 2005.
7. Yingchun Zhu and Laurie Hendren, *Communication Optimizations for Parallel C Programs*, Journal of Parallel and Distributed Computing, Vol. 58, No. 2, pp. 301-332, 1999.
8. Yingchun Zhu and Laurie Hendren, *Locality Analysis for Parallel C Programs*, IEEE Transactions on Parallel and Distributed Systems, Vol. 10, No. 2, pp. 99-114, 1999.
9. Laurie J. Hendren, Xinan Tang, Yingchun Zhu, Shereen Ghobrial, Guang R. Gao, Xun Xue, Haying Cai and Pierre Ouellet, *Compiling C for the EARTH Multithreaded Architecture*, International Journal of Parallel Programming, Vol. 25, No. 4, pp. 305-337, 1997.
10. Rakesh Ghiya and Laurie J. Hendren, *Connection Analysis: A Practical Interprocedural Heap Analysis for C*, International Journal of Parallel Programming, Volume 24, No. 6, pp. 547-578, 1996.
11. Herbert H. J. Hum, Olivier Maquelin, Kevin B. Theobald, Xinmin Tian, Guang R. Gao, and Laurie J. Hendren. *A study of the EARTH-MANNA multithreaded system*, International Journal of Parallel Programming, Volume 24, No. 4, pp. 319-347, August 1996.
12. E. Merlo, J. F. Girard, L. Hendren, R. De Mori, *Multi-valued Constant Propagation Analysis for User Interface Engineering*, International Journal of Software Engineering and Knowledge Engineering, Vol. 5, No. 1, March 1995.
13. Anne Rogers, Martin C. Carlisle, John H. Reppy and Laurie J. Hendren, *Supporting Dynamic Data Structures on Distributed Memory Machines*, ACM Transactions on Programming Languages and Systems, vol. 17, no. 2, pp. 233-263, March 1995.
14. E. Merlo, Pierre-Yves Gangé, J.F. Girard, K. Kontogiannis, L. Hendren, P. Panangaden and R. De Mori, *Reverse Engineering and Reengineering of User Interfaces*, IEEE Software, Vol. 12, No. 1, pp. 64-73, Jan. 1995.
15. Laurie J. Hendren, Guang R. Gao, Erik R. Altman, and Chandrika Mukerji, *A Register Allocation Framework Based on Hierarchical Cyclic Interval Graphs*, The Journal of Programming Languages, Chapman and Hall, Vol. 1, No. 3, pp. 155-185, 1993.

16. Laurie J. Hendren and Guang R. Gao, *Designing Programming Languages for the Analyzability of Pointer Data Structures*, Computer Languages, Pergamon Press, Vol. 19, No. 2, pp. 119-134, April 1993.
17. Joseph Hummel, Laurie J. Hendren, and Alexandru Nicolau, *Abstractions for Recursive Pointer Data Structures: Improving the Analysis and Transformation of Imperative Programs*, ACM Letters on Programming Languages and Systems, Vol. 1, No. 3, pp. 243-260, September 1992.
18. L.J. Hendren and A. Nicolau, *Parallelizing Programs with Recursive Data Structures*, IEEE Transactions on Parallel and Distributed Computing, Vol. 1, No. 1, pp. 35-47, January 1990.
19. J.I. Glasgow, L.J. Hendren and M.A. Jenkins, *A Programming Language for Learning Environments*, Computational Intelligence (Special Edition on AI Approaches to Education), pp. 68-75, May 1986.

Book Chapters

1. Joe Hummel, Laurie J. Hendren and Alex Nicolau, *Path Collection and Dependence Testing in the Presence of Dynamic Pointer-Based Data Structures*, Chapter 2 in Languages, Compilers and Run-Time Systems for Scalable Computers (Proceedings of the 3rd Workshop), B. Szymanski and B. Sinharoy (Editors), Kluwer Academic Publishers, pp. 15-27, May 1995.
2. Kevin B. Theobald, Guang R. Gao, and Laurie J. Hendren, *The Effects of Resource Limitations on Program Parallelism*, In Advanced Topics in Dataflow Computing and Multithreading, Lubomir Bic, Jean-Luc Gaudiot and Guang R. Gao (Editors), IEEE Computer Society, pp. 348-373, 1994.

Refereed Conference Publications

1. Jesse Doherty, Laurie Hendren and Soroush Radpour, *Kind Analysis for MATLAB*, Proceedings of ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA), pp. 99-118, October 2011.
2. Nurudeen Lameed and Laurie Hendren, *Staged Static Techniques to Efficiently Implement Array Copy Semantics in a MATLAB JIT Compiler*, Proceedings of the 21st International Conference on Compiler Construction (CC 2011), pp. 22-41, March 2011.
3. Andrew Casey and Laurie Hendren, *MetaLexer: a modular lexical specification language*, Proceedings of the 11th International Conference on Aspect-Oriented Software Development (AOSD 2011), pp. 7-18, March 2011.
4. Raja Vallée-Rai, Laurie Hendren, Vijay Sundaresan, Patrick Lam, Etienne Gagnon and Phong Co, *Soot - A Java Optimization Framework*, In Special Edition of the Proceedings of CASCON for High-Impact papers for the 20th Anniversary of CASCON (IBM Center for Advanced Studies Conference), Toronto, November 2010. (originally in CASCON 1999)

5. Patrice Pominville, Feng Qian, Raja Vallée-Rai, Laurie Hendren and Clark Verbrugge, *A Framework for Optimizing Java Using Attributes*, In Special Edition of the Proceedings of CASCON for High-Impact papers for the 20th Anniversary of CASCON (IBM Center for Advanced Studies Conference), Toronto, November 2010. (originally in CASCON 2000)
6. Eric Bodden, Patrick Lam and Laurie Hendren, *Clara: A Framework for Statically Evaluating Finite-state Runtime Monitors*, Proceedings of the 1st International Conference on Runtime Verification (RV 2010), November 2010.
7. Toheed Aslam, Jesse Doherty, Anton Dubrau and Laurie Hendren, *AspectMatlab: An Aspect-Oriented Scientific Programming Language*, Proceedings of the 9th International Conference on Aspect-Oriented Software Development (AOSD 2010), pp. 181-192, March 2010.
8. Maxime Chevalier-Boisvert, Laurie Hendren and Clark Verbrugge, *Optimizing MATLAB through Just-In-Time Specialization*, Proceedings of the International Conference on Compiler Construction (CC 2010), pp. 46-65, March 2010.
9. Dehua Zhang, Ekwa Duala-Ekoko and Laurie Hendren, *Impact analysis and visualization toolkit for static crosscutting in AspectJ*, Proceedings of the 17th International Conference on Program Comprehension (ICPC 2009), pp. 60-69, May 2009.
10. Eric Bodden, Patrick Lam and Laurie Hendren, *Object representatives: a uniform abstraction for pointer information*, Proceedings of the BCS International Academic Conference, British Computing Society, pp. 392-405, December 2008.
11. Eric Bodden, Patrick Lam and Laurie Hendren, *Finding Programming Errors Earlier by Evaluating Runtime Monitors Ahead-of-Time*, Proceedings of the Sixteenth ACM SIGSOFT International Symposium on Foundations of Software Engineering (FSE 2008), pp. 36-47, November 2008.
12. Barthélémy Dagenais and Laurie Hendren, *Enabling Static Analysis for Partial Java Programs*, ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA), pp. 313-328, October 2008.
13. Eric Bodden, Reehan Shaikh and Laurie J. Hendren, *Relational aspects as tracematches*, Proceedings of the 7th International Conference on Aspect-Oriented Software Development (AOSD 08), pp. 84-95, Brussels, Belgium, March 2008.
14. Eric Bodden, Laurie J. Hendren and Ondrej Lhotak, *A Staged Static Program Analysis to Improve the Performance of Runtime Monitoring*, Proceedings of the 21st European Conference on Object-Oriented Programming (ECOOP 2007), pp. 525-549, Berlin, Germany, July 2007.
15. Nomair A. Naeem, Michael Batchelder and Laurie J. Hendren, *Metrics for Measuring the Effectiveness of Decompilers*, Proceedings of the 15th International Conference on Program Comprehension (ICPC 2007), pp. 253-258, Banff, Alberta, Canada, June 2007.
16. Eric Bodden, Laurie J. Hendren, Patrick Lam, Ondrej Lhotak and Nomair A. Naeem, *Collaborative Runtime Verification with Tracematches*, Revised selected papers from the 7th International Workshop on Runtime Verification, LNCS 4839, pp. 9-21, March 2007.

17. Michael Batchelder and Laurie J. Hendren, *Obfuscating Java: The Most Pain for the Least Gain*, Proceedings of the 16th International Conference on Compiler Construction (CC 2007), pp. 96-110, Braga, Portugal, March 2007.
18. Nomair A. Naeem and Laurie Hendren, *Programmer-friendly Decompiled Java*, Proceedings of the 14th IEEE International Conference on Program Comprehension (ICPC 2006), pp. 327-336, Athens, Greece, June 2006.
19. Neil Ongkingco, Pavel Avgustinov, Julian Tibble, Laurie Hendren, Oege de Moor, Ganesh Sittampalam, *Adding Open Modules to AspectJ*, Proceedings of the 5th International Conference on Aspect-Oriented Software Development (AOSD 2006), pp. 39-50, Bonn, Germany, March 2006.
20. Ondrej Lhotak and Laurie Hendren, *Context-Sensitive Points-to Analysis: Is it Worth It?*, Proceedings of the 15th International Conference on Compiler Construction (CC 2006), LNCS 3923, pp. 47-64, Vienna, Austria, March 2006.
21. Chris Allan, Pavel Avgustinov, Aske Simon Christensen, Laurie Hendren, Sascha Kuzins, Ondrej Lhotak, Oege de Moor, Damien Sereni, Ganesh Sittampalam and Julian Tibble, *Adding Trace Matching with Free Variables to AspectJ*, Proceedings of the ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA 2005), San Diego, California, USA, October 2005.
22. Pavel Avgustinov, Aske Simon Christensen, Laurie Hendren, Sascha Kuzins, Jennifer Lhotak, Ondrej Lhotak, Oege de Moor, Damien Sereni, Ganesh Sittampalam and Julian Tibble, *Optimising AspectJ*, Proceedings of the ACM SIGPLAN 2005 Conference on Programming Language Design and Implementation (PLDI 2005), pp. 117-128, Chicago, Illinois, USA, June 2005.
23. Pavel Avgustinov, Aske Simon Christensen, Laurie Hendren, Sascha Kuzins, Jennifer Lhotak, Ondrej Lhotak, Oege de Moor, Damien Sereni, Ganesh Sittampalam and Julian Tibble, *An Extensible AspectJ Compiler*, Proceedings of the 4th international conference on Aspect-oriented software development (AOSD 2005), pp. 87-98, Chicago, USA, March 2005.
24. Feng Qian and Laurie J. Hendren, *A Study in Type Analysis for Speculative Method Inlining in a JIT Environment*, International Conference on Compiler Construction (CC 2005), pp. 255-270, Edinburgh, UK, April 2005.
25. Anatole Le, Ondrej Lhotak and Laurie J. Hendren, *Using Inter-Procedural Side-Effect Information in JIT Optimizations*, International Conference on Compiler Construction (CC 2005), pp. 287-304, Edinburgh, UK, April 2005.
26. Bruno Dufour, Christopher Goard, Laurie Hendren and Clark Verbrugge (McGill University) Oege de Moor and Ganesh Sittampalam (Oxford University), *Measuring the Dynamic Behaviour of AspectJ Programs* Proceedings of the ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA 2004), pp. 149-168, Vancouver, Canada, October 2004.

27. Ondrej Lhotak and Laurie Hendren *Jedd: A BDD-based relational extension of Java*, Proceedings of the ACM SIGPLAN 2004 Conference on Programming Language Design and Implementation (PLDI 2004), pp. 158-169, Washington DC, USA, June 2004.
28. Feng Qian and Laurie Hendren, *Towards Dynamic Interprocedural Analysis in JVMs*, 3rd Virtual Machine Research and Technology Symposium (VM 04), pp. 139-150, San Jose, California, USA, May 2004.
29. Jennifer Lhotak, Ondrej Lhotak and Laurie Hendren, *Integrating the Soot compiler infrastructure into an IDE*, International Conference on Compiler Construction (CC 2004), pp. 281-297, Barcelona, Spain, March 2004.
30. Bruno Dufour, Karel Driesen, Laurie Hendren and Clark Verbrugge, *Dynamic Metrics for Java*, Proceedings of the ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA 2003), pp. 149-168, Anaheim, USA, October 2003.
31. Qin Wang, Wei Wang, Rhodes Brown, Karel Driesen, Bruno Dufour, Laurie Hendren and Clark Verbrugge, *EVolve: An Open Extensible Software Visualization Framework*, Proceedings of the ACM Symposium on Software Visualization (SoftVis 2003), pp. 37-46, San Diego, USA, June 2003 .
32. Marc Berndl, Ondrej Lhotak, Feng Qian, Laurie Hendren and Navindra Umanee, *Points-to Analysis using BDDs*, Proceedings of the ACM SIGPLAN 2003 Conference on Programming Language Design and Implementation (PLDI 2003), pp. 103-114, San Diego, USA, June 2003.
33. Ondrej Lhotak and Laurie Hendren, *Scaling Java Points-to Analysis using Spark*, International Conference on Compiler Construction (CC 2003), pp. 170-184, Warsaw, Poland, April 2003.
34. Etienne Gagnon and Laurie Hendren, *Effective Inline-Threaded Interpretation of Java Bytecode Using Preparation Sequences*, International Conference on Compiler Construction (CC 2003), pp. 153-169, Warsaw, Poland, April 2003.
35. Marc Berndl and Laurie Hendren, *Dynamic Profiling and Trace Cache Generation for a Java Virtual Machine*, Proceedings of the International Symposium on Code Generation and Optimization (CGO 2003), pp. 276-288, San Francisco, USA, March 2003.
36. Rhodes Brown, Karel Driesen, David Eng, Laurie Hendren, John Jorgensen, Clark Verbrugge and Qin Wang, *STEP: A Framework for the Efficient Encoding of General Trace Data*, Proceedings of the ACM SIGPLAN-SIGSOFT Workshop on Program Analysis for Software Tools and Engineering, pp. 27-34, Charleston, USA, November 2002.
37. Ondrej Lhotak and Laurie Hendren, *Run-time Evaluation of Opportunities for Object Inlining in Java*, Proceedings of the Joint ACM Java Grande - ISCOPE 2002 Conference, pp. 175-184, Seattle, USA, November 2002.
38. Feng Qian and Laurie Hendren, *An Adaptive, Region-based Allocator for Java*, Proceedings of the ACM International Symposium on Memory Management, pp. 127-138, Berlin, Germany, June 2002.

39. Jerome Miecznikowski and Laurie Hendren, *Decompiling Java Bytecode: Problems, Traps and Pitfalls*, International Conference on Compiler Construction (CC 2002), pp. 111-127, Grenoble, France, April 2002.
40. Feng Qian, Laurie Hendren and Clark Verbrugge, *A Comprehensive Approach to Array Bounds Check Elimination in Java*, International Conference on Compiler Construction (CC 2002), pp. 325-342, Grenoble, France, April 2002.
41. Jerome Miecznikowski and Laurie Hendren, *Decompiling Java Using Staged Encapsulation*, Workshop on Decompilation Techniques, Stuttgart, Germany. Appeared in Proceedings of the Working Conference on Reverse Engineering, IEEE CS Press, pp. 368-374, October 2001.
42. Patrice Pominville, Feng Qian, Raja Vallée-Rai, Laurie Hendren and Clark Verbrugge, *A Framework for Optimizing Java Using Attributes*, Proceedings of the International Conference on Compiler Construction (CC 2001), LNCS 2027, pp. 334-354, April 2001.
43. Etienne Gagnon and Laurie Hendren, *SableVM: A Research Framework for the Efficient Execution of Java Bytecode*, Proceedings of the Java Virtual Machine Research and Technology Symposium (JVM '01), pages 27-39, Usenix, Monterey, California, USA, April 2001.
44. Patrice Pominville, Feng Qian, Raja Vallée-Rai, Laurie Hendren and Clark Verbrugge, *A Framework for Optimizing Java Using Attributes*, Proceedings of CASCON (IBM Center for Advanced Studies Conference) 2000, pp. 152-169, November 2000.
45. Vijay Sundaresan, Laurie Hendren, Chrislain Razafimahefa, Raja Vallee-Rai, Patrick Lam, Etienne Gagnon and Charles Godin, *Practical Virtual Method Resolution for Java*, In Proceedings of the Conference on object-oriented programming, systems, languages, and applications (OOPSLA 2000), Minneapolis, pp. 264-280, October 2000.
46. Etienne Gagnon, Laurie Hendren and Guillaume Marceau, *Efficient Inference of Static Types for Java Bytecode*, In Proceedings of the Static Analysis Symposium (SAS 2000), Santa Barbara, pp. 199-219, June 2000.
47. Raja Vallée-Rai, Etienne Gagnon, Laurie Hendren, Patrick Lam, Patrice Pominville and Vijay Sundaresan, *Optimizing Java Bytecode using the Soot Framework: Is it Feasible?*, In Proceedings of the International Conference on Compiler Construction (CC 2000), Berlin, pp. 18-34, March 2000.
48. Raja Vallee-Rai, Laurie Hendren, Vijay Sundaresan, Patrick Lam, Etienne Gagnon and Phong Co, *Soot - A Java Optimization Framework*, In Proceedings of CASCON (IBM Center for Advanced Studies Conference) 99, Toronto, pp. 125-135, November 1999.
49. Etienne Gagnon and Laurie J. Hendren, *SableCC: An Object-Oriented Compiler Framework*, Technology of Object-Oriented Languages and Systems 26th International Conference and Exhibition, pp. 140-154, August 1998.
50. Yingchun Zhu and Laurie J. Hendren, *Communication Optimizations for Parallel C Programs*, Proceedings of the ACM SIGPLAN '98 Conference on Programming Language Design and Implementation, pp. 199-211, June 1998.

51. Christopher Lapkowski and Laurie J. Hendren, *Extended SSA numbering: Introducing SSA properties to languages with multi-level pointers*, International Conference on Compiler Construction, pp. 128-143, April 1998.
52. Rakesh Ghiya and Laurie J. Hendren, *Detecting Parallelism in C Programs with Recursive Data Structures*. International Conference on Compiler Construction, pp. 159-173, April 1998.
53. Rakesh Ghiya and Laurie J. Hendren, *Putting Pointer Analysis to Work*, Proceedings of the 35th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL '98), pp. 121-133, January 1998.
54. Yingchun Zhu and Laurie J. Hendren, *Locality Analysis for Parallel C Programs*, Proceedings of Parallel Architectures and Compilation Techniques (PACT '97), pp. 2-13, November 1997.
55. Xinan Tang, Rakesh Ghiya, Laurie J. Hendren and Guang R. Gao, *Heap Analysis and Optimizations for Threaded Programs*, Proceedings of Parallel Architectures and Compilation Techniques (PACT '97), pp. 14-25, November 1997.
56. Laurie J. Hendren, Xinan Tang, Yingchun Zhu, Guang Gao, Xun Xue, Haiying Cai, and Pierre Ouellet, *Compiling C for the EARTH multithreaded architecture*, Proceedings of Parallel Architectures and Compilation Techniques (PACT '96), pp. 12-23, October 1996.
57. Clark Verbrugge, Phong Co and Laurie J. Hendren, *Generalized Constant Propagation: A Study in C*, Proceedings of the 6th International Conference on Compiler Construction (CC '96), Lecture Notes in Computer Science, Volume 1060, Tibor Gyimothy (Editor), pages 74-89, April 1996.
58. Rakesh Ghiya and Laurie J. Hendren, *Is it a Tree, a DAG or a Graph? A Shape Analysis for Heap-Directed Pointers in C*, Proceedings of the 23rd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL '96), pages 1-15, January 1996.
59. Rakesh Ghiya and Laurie J. Hendren, *Connection Analysis: A Practical Interprocedural Heap Analysis for C*, in Proceedings of the Proceedings of the Eighth Workshop on Languages and Compilers for Parallel Computing (LCPC '95), Lecture Notes in Computer Science, Volume 1033, pages 515-534, August 1995.
60. Herbert H. J. Hum, Olivier Maquelin, Kevin B. Theobald, Xinmin Tian, Xinan Tang, Guang R. Gao, Phil Cupryk, Nasser Elmasri, Laurie J. Hendren, Alberto Jimenez, Shoba Krishnan, Andres Marquez, Shamir Merali, Shashank S. Nemawarkar, Prakash Panangaden, Xun Xue, and Yingchun Zhu. *A design study of the EARTH multiprocessor* Proceedings of the IFIP WG 10.3 Working Conference on Parallel Architectures and Compilation Techniques, (PACT '95), pages 59-68, June 1995.
61. J. Hummel, L. Hendren and A. Nicolau, *A Framework for Data Dependence Testing in the Presence of Pointers*, Proceedings of the 1994 International Conference on Parallel Processing (ICPP '94), Volume II, pages 216-224, August 1994.

62. Maryam Emami, Rakesh Ghiya and Laurie J. Hendren, *Context-Sensitive Interprocedural Points-to Analysis in the Presence of Function Pointers*, Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI '94), pp. 242-256, June 1994.
63. J. Hummel, L. Hendren and A. Nicolau, *A General Data Dependence Test for Dynamic, Pointer-Based Data Structures*, Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI '94), pp. 218-229, June 1994.
64. Ana Erosa and Laurie J. Hendren, *Taming Control Flow: A Structured Approach to Eliminating Goto Statements*, Proceedings of the 1994 IEEE International Conference on Computer Languages (ICCL '94), Toulouse, France, pp. 229-240, May 1994.
65. Justiani¹ and Laurie J. Hendren, *Supporting Array Dependence Testing for an Optimizing/Parallelizing C Compiler*, Proceedings of the 5th International Conference on Compiler Construction (CC '94), Lecture Notes in Computer Science, Volume 786, Peter A. Fritzon (Editor) pp. 309-323, April 1994.
66. J. Hummel, L. Hendren and A. Nicolau, *A Language for Conveying Aliasing Properties of Dynamic, Pointer-Based Data Structures*, Proceedings of the 8th International Parallel Processing Symposium (IPPS '94), pp. 208-216, April 1994.
67. E. Merlo, J. F. Girard, L. Hendren and R. De Mori, *Multi-Valued Constant Propagation for the Reengineering of User Interfaces*, Proceedings of Conference on Software Maintenance-1993, Montreal, Quebec, pp. 120-129, September 1993.
68. Martin C. Carlisle, Anne Rogers, John H. Reppy and Laurie J. Hendren, *Early Experiences with Olden*, Proceedings of the Sixth Annual Workshop on Languages and Compilers for Parallel Computing, Portland, Oregon, Lecture Notes in Computer Science (LCPC '93), Vol. 768, pp. 1-20, August 1993.
69. Kevin B. Theobald, Guang R. Gao, and Laurie J. Hendren, *Speculative Execution and Branch Predication on Parallel Machines*, Proceedings of the 7th ACM International Conference of Supercomputing (ICS '93), Tokyo, Japan, pp. 77-86, July 1993.
70. Kevin B. Theobald, Guang R. Gao, and Laurie J. Hendren, *On the Limits of Program Parallelism and its Smoothability*, Proceedings of the 25th Annual International Symposium on Microarchitecture (MICRO '92), pp. 10-19, December 1992. (*A longer version in ACAPS Technical Memo 40, School of Computer Science, McGill University, June 1992.*)
71. Laurie J. Hendren, Guang R. Gao, Erik R. Altman, and Chandrika Mukerji, *A Register Allocation Framework Based on Hierarchical Cyclic Interval Graphs*, Proceedings of the International Conference on Compiler Construction (CC '92), Lecture Notes in Computer Science, Vol. 641, U. Kastens and P. Pfahler (Editors), pp. 176-191, October 1992.
72. J. Hummel, L.J. Hendren, and A. Nicolau, *Applying an Abstract Data Structure Description Approach to Parallelizing Scientific Pointer Programs*, International Conference on Parallel Processing, (Volume II - software) (ICPP '92), pp. 100-104, Aug. 1992.

¹Justiani has only one name.

73. Laurie J. Hendren, Chris Donawa, Maryam Emami, Guang R. Gao, and Bhama Sridharan. *Designing the McCAT Compiler Based on a Family of Structured Intermediate Representations*, Proceedings of the 5th International Workshop on Languages and Compilers for Parallel Computing (LCPC '92), New Haven, Connecticut, Lecture Notes in Computer Science, Vol. 757, Utpal Banerjee, David Gelernter, Alex Nicolau and David Padua (Editors), pp. 406-420, August 1992.
74. Anne Rogers, John H. Reppy, and Laurie J. Hendren. *Supporting SPMD Execution for Dynamic Data Structures*, Proceedings of the 5th International Workshop on Languages and Compilers for Parallel Computing (LCPC '92), New Haven, Connecticut, Lecture Notes in Computer Science, Vol. 757, Utpal Banerjee, David Gelernter, Alex Nicolau and David Padua (Editors), pp. 192-207, August 1992.
75. Laurie J. Hendren, Joseph Hummel, and Alexandru Nicolau, *Abstractions for Recursive Pointer Data Structures: Improving the Analysis and Transformation of Imperative Programs*, Proceedings of the ACM SIGPLAN '92 Conference on Programming Language Design and Implementation (PLDI '92), pp. 249-260, June 1992.
76. G. Gao, L. Hendren, P. Panangaden, M. Feeley, L. Tao, M. Hancu, J. Lebensold and V. Van Dongen, "Towards a Portable Parallel Programming Environment", Proceedings of the Supercomputing Symposium '92, June 1992.
77. Weiren Ding and Laurie J. Hendren, *SELSYN-C: A Self-Synchronizing Parallel Programming Language*, Proceedings of the 4th International Conference on Computing and Information, pp. 135-138, May 1992.
78. Laurie J. Hendren and Guang R. Gao, *Designing Programming Languages for Analyzability: A Fresh Look at Pointer Data Structures*, Proceedings of the 4th IEEE International Conference on Computer Languages (ICCL '92), pp. 242-251, April 1992.
79. L.J. Hendren and A. Nicolau, *Parallelizing Programs with Recursive Data Structures*, Proceedings of the International Conference on Parallel Processing (ICPP '89), pp. 49-56 (volume II - software), August 1989.
80. L.J. Hendren and A. Nicolau, *Interference Analysis Tools for Parallelizing Programs with Recursive Data Structures*, Proceedings of the International Conference of Supercomputing (ICS '89), pp. 205-214, June 1989.
81. L.J. Hendren, *RIPO - An Automated Prototyping Tool Based on Nested Arrays*, APL84 Conference Proceedings, APL Quote Quad Volume 14 Number 4, pp. 181-184, June 1984.

Other Publications

1. Patrick Lam, Eric Bodden, Ondrej Lhotak and Laurie Hendren, *The Soot framework for Java program analysis: a retrospective*, Proceedings of the Cetus Users and Compiler Infrastructure Workshop (in conjunction with PACT 2011), 8 pages, October 2011.
2. Laurie Hendren, Jesse Doherty, Anton Dubrau, Rahul Garg, Nurudeen Lameed, Soroush Radpour, Amina Aslam, Toheed Aslam, Andrew Casey, Maxime Chevalier Boisvert, Jun Li, Clark

- Verbrugge and Olivier Savary Belanger, *McLAB: enabling programming language, compiler and software engineering research for MATLAB*, Proceedings of the ACM International Conference on Object Oriented Programming Systems, Languages and Applications Companion (abstract of poster), pp. 195-196, October 2011.
3. Laurie Hendren, *Typing aspects for MATLAB*, Proceedings of the Sixth Annual Workshop on Domain-specific Aspect Languages (at AOSD 2011), pp. 13-18, March 2011.
 4. Eric Bodden, Laurie Hendren, Patrick Lam, Ondrej Lhotak and Nomair A. Naeem, *Collaborative runtime verification with tracematches*, Proceedings of the 7th workshop on Runtime Verification at the 6th International Conference on Aspect-Oriented Software Development (RV 2007), LNCS 4839, March 2006. (Proceedings published in 2007).
 5. Pavel Avgustinov, Julian Tibble, Eric Bodden, Laurie J. Hendren, Ondrej Lhotak, Oege de Moor, Neil Ongkingco and Ganesh Sittampalam, *Efficient trace monitoring*, pp. 685-686, OOPSLA Companion (abstract of poster), pp. 685-686, October 2006.
 6. Pavel Avgustinov, Eric Bodden, Elnar Hajiyevev, Laurie J. Hendren, Ondrej Lhotak, Oege de Moor, Neil Ongkingco, Damien Sereni, Ganesh Sittampalam, Julian Tibble and Mathieu Verbaere, *Aspects for Trace Monitoring*, paper associated with invited talk by Oege de Moor, pp. 20-39, FATES/RV, August 2006.
 7. Pavel Avgustinov, Aske Simon Christensen, Laurie Hendren, Sascha Kuzins, Jennifer Lhotak, Ondrej Lhotak, Oege de Moor, Damien Sereni, Ganesh Sittampalam and Julian Tibble *abc: The AspectBench Compiler for AspectJ*, paper associated with invited talk by Oege de Moor, International Conference on Generative Programming and Component Engineering (GCPE 2005), pages 10-15, September 2005.
 8. Laurie J. Hendren, Maryam Emami, Rakesh Ghiya, and Clark Verbrugge, *A Practical Context-Sensitive Interprocedural Analysis for C Compilers*, ACAPS Technical Memo 72, School of Computer Science, McGill University, July 1993.
 9. ZhiPing Qiu, Laurie J. Hendren, and Behcet Sarikaya, *The Design and Implementation of a Compiler for Conformance Testing*, Proceedings of the Poster Session, International Conference of Compiler Construction, Universität-Gesamthochschule-Paderborn, Report 103, October 1992.
 10. Laurie J. Hendren, *Parallelizing Programs with Recursive Data Structures*, Technical Report TR 90-1114 (Ph.D. Thesis), Cornell University, April 1990.
 11. Laurie J. Hendren, *Recursive data structures and parallelism detection*, Technical Report TR 88-924, Cornell University, June 1988.
 12. Laurie J. Hendren, Alex Nicolau, Jon Solworth and Patrick Xavier, *Low-level programming for a massively fine-grain computer: The Microflow Approach*, Technical Report TR87-806, Cornell University, March 1987.
 13. Laurie J. Hendren. *ISON: An Introductory Subset of Nial*, M.Sc. Thesis, Queen's University, 1984.

14. R. Black, P.J. Nelson and L.J. Hendren, *NRC Turtle Graphics*, Proceedings of the Tutorial and Workshop on Computers and the Handicapped, pp. 89-93, 1982.

Software Systems

Importance of Experimental Software Systems

In addition to publications, the kind of experimental work I do also requires the development of large and complex software systems. It is my view that the development of such systems is an integral part of the design of new analyses and approaches, and the design of such systems is often a research project itself. Such an experimental system is of critical importance in demonstrating the usefulness of a technique or approach and also can provide the foundations for future research both in my own research group and for research groups around the world. Thus, whenever possible, we provide our tools under open source licenses.

Major Software Systems

1. McLAB, a compiler and VM toolkit for scientific languages, including a front-end toolkit, a VM with JIT and a MATLAB-to-Fortran compiler
<http://www.sable.mcgill.ca/mclab>.

The McLab framework is a new project for developing both toolkits and new analyses and techniques for dynamic scientific programming languages like Matlab. There is currently a real lack of such toolkits and it is our hope that by providing such a framework we can stimulate academic research into dynamic scientific language design and associated virtual machines and compilers.

Currently the framework is being used by my research group and a graduate class. We have released the first version of the framework under an open source license. We have also released the Currently we have released the AspectMatlab compiler.

2. abc, the AspectBench Compiler, developed with Oxford, Aarhus and Waterloo,
<http://www.sable.mcgill.ca/abc/>.

The abc framework has become a popular framework for researchers designing and implementing new extensions to the aspect-oriented language AspectJ. Some of these extensions, which are also publicly-available are listed at <http://www.sable.mcgill.ca/abc/projectsexts>.

3. Soot, a Java Bytecode Analysis and Transformation Framework,
<http://www.sable.mcgill.ca/soot/>.

Soot is probably our most widely used toolkit. It is not uncommon to see at least a couple of papers at each compiler conference which have used Soot as their main toolkit. It is also quite often used in advanced compiler courses. A wiki listing some users is found at <https://svn.sable.mcgill.ca/wiki/index.cgi/SootUsers>. Although this is just a voluntary list (and thus does not include many users) it does give a good flavour of the wide variety of research that uses Soot.

Other Software Systems

1. Metalexer, an extensible lexer generator,
<http://www.sable.mcgill.ca/metalexer>.
Metalexer was developed to fulfill the need for a lexer generator that was modular and could be used naturally in extensible toolkits (like McLab and abc).
2. SableCC, the Sable Research Group's Compiler Compiler.
SableCC was started as the M.Sc. research project of Etienne Gagnon. Etienne is now a professor at UQAM and continued the development. His current web site is <http://sablecc.org>.
3. SableVM, a portable Java Virtual Machine,
<http://www.sablevm.org/>.
4. Ashes, a collection of Java Benchmarks and Scripts,
<http://www.sable.mcgill.ca/ashes/>.
5. EVolve, an Extensible Software Visualization Framework,
<http://www.sable.mcgill.ca/evolve/>.
6. STEP, an Extensible Program Trace Encoding,
<http://www.sable.mcgill.ca/step/>
7. PTA-BDD, a Points-to Analysis using BDDs,
<http://www.sable.mcgill.ca/bdd/>
8. Paddle, a BDD-based Context-Sensitive Interprocedural Analysis for Java,
<http://www.sable.mcgill.ca/paddle/>
9. Dava, a Tool-Independent Decompiler for Java,
<http://www.sable.mcgill.ca/dava/>
10. JBCO, the Java Bytecode Obfuscator,
<http://www.sable.mcgill.ca/JBCO/>
11. AIA, Aspect Impact Analysis,
<http://www.sable.mcgill.ca/aia/>

Invited Lectures, Talks and Tutorials

- Keynote speaker, 10th Workshop of Compiler-Driven Performance, November 10, 2011.
- Keynote speaker, International Symposium on Software Testing and Analysis, July 2011. See <http://issta11.unl.edu/program/invited-speakers/>.
- Leverhulme Lecture Series, University of Oxford. For complete links and slides see <http://www.sable.mcgill.ca/mclab/leverhulme.html>.

- *Compiler Tools for MATLAB*, June 10, 2011.
- *Language Extensions for MATLAB*, June 17, 2011.
- *McLAB: A Toolkit for Static and Dynamic MATLAB Compilers*, July 1, 2011.
- Invited speaker, Imperial College London LogIC Seminar, June 26 2011. See <http://www.doc.ic.ac.uk/~bl610/logICseminar/>.
- Invited speaker, University of Cambridge Computing Laboratory Colloquium, June 15, 2011.
- Moderator, Panel on *Teaching Programming Language Design and Implementation ... What? To Whom? How?*, International Conference on Programming Language and Implementation (PLDI 2011), June 8, 2011.
- Tutorial presentation, *Introduction to MATLAB, a compiler and VM framework for MATLAB*, presented by Laurie Hendren, Rahul Garg and Nurudeen Lameed, PLDI 2011, June 2011. See http://www.sable.mcgill.ca/mclab/pldi_tutorial.
- Invited speaker, University of Edinburgh Informatics, Institute for Computing Systems Architecture Seminar, June 14, 2011. See <http://wcms.inf.ed.ac.uk/icsa/events/laurie-hendren-compiler-tools-for-matlab>. During this visit I also was asked to create a podcast, see <http://computersciencepodcast.com/podcasts.html>.
- University of Herfordshire, Computer Science Research Colloquium, May 31, 2011. See <http://cs-colloq.feis.herts.ac.uk/hendren2011.txt>.
- University of Kent, School of Computing Colloquium, December 14, 2010. See http://www.cs.kent.ac.uk/dept_info/seminars/2010_11/seminars.html.
- Invited speaker, *Pointer Analysis - Experiences and Future Challenges*, Visions of Computer Science, British Computing Society, September 2008.
- Speaker and Panel Chair, *The Future of Compiler Education*, Workshop of Future Directions of Compiler Research, University of Southern California, Information Sciences Institute, CA, USA, Feb 2007.
- Keynote speaker, *Optimizing AspectJ with abc*, MASPLAS 2006, Rutgers, December 2006.
- Harvard University, Colloquium, *Optimizing AspectJ with abc*, December 1, 2005.
- Tutorial presentation, *abc: A Workbench for Aspect-Oriented Programming Language Research*, presented by Oege de Moor (Oxford), Laurie Hendren (McGill), Sascha Kuzins (Oxford) and Damien Sereni (Oxford), AOSD 2005, March 2005.
- Speaker, *abc - The AspectBench Compiler*, 3rd Workshop of Compiler-Driven Performance, in association with CASCON 2004, October 2004.
- Cambridge University, Departmental Seminar, *Soot, Points-to Analysis and BDDs*, November 21, 2003.

- Oxford University, Computing Laboratory Seminar, *Soot, Points-to Analysis and BDDs*, November 25, 2003.
- Series of tutorials on Soot, Oxford Computing Lab, September to October 2003.
- Tutorial presentation, *Soot, a Tool for Analyzing and Transforming Java Bytecode*, presented by Laurie Hendren, Patrick Lam, Jennifer Lhotak, Ondrej Lhotak and Feng Qian, presented at PLDI 2003, June 2003.
- Université du Québec à Montréal, Departmental Research Seminar, *Optimizing Compilers: How good are they?*, March 21, 2003.
- Speaker, *Soot - a Java bytecode analysis and transformation toolkit*, Dagstuhl Seminar on Program Analysis for Object-Oriented Evolution, February 2003.
- Keynote Lecture in Computer Science, APICS Math/Stat and CS Meeting, Mount Allison University, presentation on *Optimizing Compilers: How good are they?*, October 19, 2002.
- Oxford University, Computing Laboratory, Seminar on *Analyzing and Transforming Java Bytecode using the Soot Framework*, May 2002.
- University of Alberta, Distinguished Lecturer Series, presentation on *Analyzing and Decompile Java Bytecode*, January 2002.
- IBM Watson Lab, invited talk, presentation on *Optimizing Java Bytecode using Soot*, February 2001.
- Speaker, *Practical Virtual Method Call Resolution for Java*, Dagstuhl Seminar on the Effective Implementation of Object Oriented Programming Languages, November 2000.
- University of Alberta, Department of Computer Science, Departmental Seminar, presentation on *Optimizing Java Bytecode*, February 2000.
- Speaker, *Tools and Analyses for Java Bytecode*, Dagstuhl Seminar on Program Analysis, Dagstuhl, Germany, April 1999.
- Kansas State University, Department of Computing and Information Sciences, Distinguished Lecturer Series, presentation on *Optimizing and Parallelizing Compilers: How good are they?*, November 1998.
- Kansas State University, Department of Computing and Information Sciences, presentation as part of the mini-workshop on Program Analysis and Model Checking, *The Sable Framework: tools and analyses for Java*, November 1998.
- Rutgers University, Departmental Seminar, presentation on *Putting Pointer Analysis to Work*, July 1998.
- Speaker, *Putting Pointer Analysis to Work* Dagstuhl Seminar on Programs with Recursively Defined Data Structures, Dagstuhl, Germany, April 1998.

- Speaker, *Compiling for Distributed-Memory Architectures (EARTH-C)*, Dagstuhl Seminar on Programs with Recursively Defined Data Structures, Dagstuhl, Germany, April 1998.
- Chalmers University, Functional Programming Languages Seminar, presentation on *Compiling Java: Can we have the elegance of Java and the speed of C?*, Gothenburg, Sweden, May 1997.
- Aarhus University, Departmental Lecture Series, presentation on *Optimizing and Parallelizing Compilers: How good are they?*, Aarhus, Denmark, March 1997.
- Aarhus University, BRICS (Basic Research in Computer Science) Seminar, presentation on *Compiling Java: Can we have the elegance of Java and the speed of C?*, Aarhus, Denmark, February 1997.
- University of Toronto and IBM Toronto, research presentation on *Pointer Analysis in the McCAT C Compiler*, Toronto, Ontario, April 1996.
- INRIA, Rocquencourt, seminar on *Pointer Analysis in the McCAT C Compiler*, Rocquencourt, France, January 1996.
- Queen's University 25th Anniversary Conference, *High-performance Compilers for High-performance Computers*, Kingston, Ontario, June 1994.
- Intel (Compiler Research Group), research meetings and an extended talk on *Interprocedural Analysis of Pointer Data Structures and Intermediate Representations*, San Jose, California, February 1993.
- Cornell University, A series of talks on: (1) *An Introduction to Pointer Analysis*, (2) *Analyzing Imperative Programs with Dynamically-Allocated Pointer Data Structures*, and (3) *Improving the Analysis of Pointer Data Structures*, and (4) a new SPMD (Single Program Multiple Data) model for programs with pointer data structures, September 1992.
- Invited Lecturer, *The Analysis and Transformation of Programs with Pointer Data Structures*, The Leonardo Fibonacci Institute for the Foundations of Computer Science, Course on Parallelizing Compilers, Trento, Italy, June 29-July 3, 1992.
- Stanford University, A series of three talks: (1) *An Introduction to Pointer Analysis*, (2) *Analyzing Imperative Programs with Dynamically-Allocated Pointer Data Structures*, and (3) *Improving the Analysis of Pointer Data Structures*, March 1992.
- Invited Speaker, *Designing Imperative Programming Languages for Analyzability: Parallelism and Pointer Data Structures*, Workshop on Compilation of Languages for Parallel Computers (1991 International Logic Programming Symposium), San Diego, California, October 1991.
- Boston University, *Parallelizing Programs with Recursive Data Structures*, April 1991.
- University of Montreal, *Parallelizing Programs with Recursive Data Structures*, March 1991.
- Princeton University, *Parallelizing Programs with Recursive Data Structures*, February 1991.

- Rutgers University, *Alias Analysis in the Presence of Dynamically-Allocated Pointer Data Structures*, February 1991.
- Speaker, *Parallelizing Imperative Programs with Recursive Pointer Data Structures*, Workshop on Parallelism in the Presence of Pointers and Dynamically-Allocated Objects, Sponsored by the Supercomputing Research Center, Xerox Training Center, Leesburg, Virginia, March 1990.
- Departmental colloquia, given as part of a job interview, M.I.T (March 1990), McGill (March 1990), University of Waterloo (March 1990), Queen's University (March 1990), Syracuse University (March 1990), Carleton University (March 1990), University of British Columbia (February 1990), University of Alberta (February 1990), York University (February 1990), and Penn State University (November 1989).
- Invited Speaker, *Interference Analysis Tools and Parallelization Techniques for C Programs with Recursive Data Structures*, Workshop on Scientific and Numerical Programming in C (Supercomputing '89), Reno, Nevada, November 1989.

Teaching Experience

I have taught courses at all levels from introductory programming courses for a broad audience to very specialized graduate courses. I take my teaching duties as seriously as my research duties and find that the research inspires new content and projects for my courses and conversely sometimes the courses inspire new research projects.

Courses taught at McGill

- Co-ordinator, course designer, and instructor for COMP 202, Introduction to Computer Science I, McGill University.
- Instructor for course COMP 203, Introduction to Computer Science II (Algorithms and Data Structures), McGill University.
- Course Designer and Instructor for COMP 303, Programming Techniques, McGill University.
- Course designer and instructor for COMP 520, Compiler Design, McGill University. This course was designed in cooperation with Michael I. Schwartzbach at Aarhus University. It focuses on teaching the principles of compilers as they relate to state-of-the-art applications including the Java programming language, and world wide web documents with state. The course has been adopted by many other institutions.
- Instructor and course designer for COMP 621, Optimizing Compilers, McGill University.
- Instructor and course designer for COMP 762, Special Topics, Advanced Static and Dynamic Compiler Techniques.
- Instructor and course designer for course COMP 763, Special Topics, Advanced Seminar on Compilation and Run-time Techniques.

Courses taught outside McGill

- Instructor for the course CS 310, Data Structures and Algorithms, Cornell University.
- Project Instructor for the course CS 412, Compiler Construction, Cornell University.
- Instructor for course OPC, Optimizing and Parallelizing Compilers, Aarhus University, Denmark.

Graduate Students

Typically I have a group of 7-10 graduate students and additionally often have 1 or 2 undergraduate students. There are usually significantly more M.Sc. students than Ph.D. students. The M.Sc. students are strong students, they complete quite impressive M.Sc. theses, and most of them co-author at least one research paper. However, many such students prefer to go on to industrial jobs after their M.Sc. studies and their graduate studies is often very useful for them in finding exciting employment opportunities and this also provides industry with well qualified students.

This mix of students, with a considerable number of M.Sc. students, means that my research projects must be quite structured, so that several M.Sc. theses can fit together towards a larger overall goal.

Many of my students have gone on to work at places like IBM Toronto and quite a few have been key players in the compiler groups there, participating in the design and implementation of important new projects.

I am also quite proud of my students who have gone on to be faculty members. Currently Etienne Gagnon is at UQAM, Bruno Dufour is at the University of Montreal, Ondrej Lhotak is at Waterloo and Patrick Lam is at Waterloo. This means that there are now four further active compiler groups at Canadian Universities, leading to more training of qualified compiler people.

Refer to Table ?? for a list of students I currently supervise. Refer to Tables ??, ?? and ?? for a summary of past students and postdocs supervised.

Table 1: Current Students

Current Ph.D. Students

Rahul Garg	09-	Ph.D.	<i>Parallel execution of Matlab on multi-core CPUs and GPGPUs</i>
Nurudeen Lameed	08-	Ph.D.	<i>Run-time optimization of MATLAB</i>

Current M.Sc. Students

Mathieu Dubet	11-	M.Sc.	<i>Efficient JIT Compilation of Compound Data Structures for Matlab</i>
Xu Li	11-	M.Sc.	<i>Generating Fortran from Matlab</i>
Vineet Kumar	11-	M.Sc.	<i>Tools and techniques for translating Matlab to X10</i>
Soroush Radpour	09-	M.Sc.	<i>Program Understanding and Refactoring Tools for MATLAB</i>
Anton Dubrau	09-	M.Sc.	<i>Advanced Techniques for Matlab-to-Fortran Translation</i>

Table 2: Graduated M.Sc., Ph.D. Students and Post-Doctoral Researchers (2010 to present)

Graduated M.Sc. Students (2010-present)

Jesse Doherty	08-11	M.Sc.	<i>McSAF: An Extensible Static Analysis Framework for the MATLAB Language</i>
Amina Aslam	08-10	M.Sc.	<i>McFLAT: A Profile-based Framework for MATLAB Loop Analysis and Transformations</i>
Toheed Aslam	08-10	M.Sc.	<i>AspectMatlab: An Aspect-Oriented Scientific Programming Language</i>

Table 3: Graduated M.Sc., Ph.D. Students and Post-Doctoral Researchers (2000 to 2009)

Post Doctoral Researchers (2000-2009)			
Patrick Lam	2007	Postdoc.	<i>Efficient Runtime Monitors</i>
Antoine Mine	2005	Postdoc.	<i>Purity Analysis</i>
Graduated Ph.D. Students (2000-2009)			
Eric Bodden	06-09	Ph.D.	<i>Verifying Finite-State Properties of Large-Scale Programs</i>
Ondrej Lhotak	03-06	Ph.D.	<i>Program Analysis Using Binary Decision Diagrams</i>
Feng Qian	01-05	Ph.D.	<i>Runtime techniques and interprocedural analysis in Java Virtual Machines</i>
Etienne Gagnon	98-02	Ph.D.	<i>A Portable Research Framework for the Execution of Java Bytecode</i>
Yingchun Zhu	94-00	Ph.D.	<i>Compiling for Multi-threaded Architectures</i>
Graduated M.Sc. Students (2000-2009)			
Amina Aslam	08-10	M.Sc.	<i>McFLAT: A Profile-based Framework for MATLAB Loop Analysis and Transformations</i>
Toheed Aslam	08-10	M.Sc.	<i>Aspect-Oriented MATLAB</i>
Maxime Chevalier-Boisvert	07-09	M.Sc.	<i>McVM - an Optimizing Virtual Machine for the MATLAB Programming Language (cosupervised with Clark Verbrugge)</i>
Jun Li	07-09	M.Sc.	<i>McFOR: a MATLAB-to-Fortran95 Compiler</i>
Andrew Casey	07-09	M.Sc.	<i>The MetaLexer Lexer Specification Language</i>
Dehua Zhang	06-08	M.Sc.	<i>Aspect Impact Analysis</i>
Michael Batchelder	05-06	M.Sc.	<i>Java Bytecode Obfuscation</i>
Nomair Naeem	03-06	M.Sc.	<i>Programmer-friendly decompiled Java</i>
Jingwu Li	04-06	M.Sc.	<i>Improving the Compiling Speed of the AspectBench Compiler (project)</i>
Jennifer Lhotak	04-05	M.Sc.	<i>Visualization Tools for Optimizing Compilers</i>
Chris Goard	02-05	M.Sc.	<i>Measuring and Improving the Runtime Behaviour of AspectJ Programs</i>
Navindra Umanee	01-05	M.Sc.	<i>Shimple: An Investigation of Static Single Assignment Form</i>
Anatole Le	02-05	M.Sc.	<i>Using Inter-Procedural Side-Effect Information in JIT Optimizations</i>
David Belanger	02-05	M.Sc.	<i>SableJIT: a retargetable just-in-time compiler (co-supervised with E. Gagnon)</i>
Bruno Dufour	02-04	M.Sc.	<i>Objective Quantification of Program Behaviour Using Dynamic Metrics (co-supervised with C. Verbrugge)</i>
Marc Berndl	01-03	M.Sc.	<i>Dynamic Profiling and Trace Cache Generation for a Java Virtual Machine</i>
John Jorgensen	00-03	M.Sc.	<i>Exceptions in Java (M.Sc. Project)</i>
Ondrej Lhotak	01-03	M.Sc.	<i>SPARK: A flexible points-to analysis framework for Java</i>
Rhodes Brown	00-03	M.Sc.	<i>STEP: A Framework for the Efficient Encoding of General Trace Data</i>
Jerome Miecznikowski	99-03	M.Sc.	<i>New algorithms for decompiling Java and their implementation in Soot</i>
Qin Wang	01-02	M.Sc.	<i>EVolve: An Extensible Software Visualization Framework (co-supervised with K. Driesen)</i>
David Eng	00-02	M.Sc.	<i>Combining Static and Dynamic Data in Code Visualization</i>
Feng Qian	99-01	M.Sc.	<i>A Comprehensive Approach to Array Bounds Check Elimination in Java</i>
Raja Vallée-Rai	97-00	M.Sc.	<i>Soot: An Optimization Framework for Java Bytecode</i>
Chrislain Razafimahefa	96-00	M.Sc.	<i>Practical Side-effect analysis for Java</i>

Table 4: Graduated M.Sc., Ph.D. Students and Post-Doctoral Researchers (1990-1999)

Post Doctoral Researchers (1990-1999)			
Marc Pouzet	95-96	Postdoc.	<i>Instruction Scheduling via Fold/Unfold</i>
Graduated Ph.D. Students (1990-1999)			
Rakesh Ghiya	96-99	Ph.D.	<i>Putting Pointer Analysis to Work</i>
Graduated M.Sc. Students (1990-1999)			
Vijay Sundaresan	97-99	M.Sc.	<i>Practical Techniques for Virtual Call Resolution in Java</i>
Etienne Gagnon	94-99	M.Sc.	<i>Sable CC Framework</i>
Laleh Tajrobehkar	97-99	M.Sc.	<i>JJC - A Java to Jimple Compiler (M.Sc. Project)</i>
Phong Co	95-99	M.Sc.	<i>Obfuscating Java Bytecode (M.Sc. Project)</i>
Greg Ward	93-98	M.Sc.	<i>Bibliography Tool (M.Sc. Project)</i>
Emily Ezust	94-97	M.Sc.	<i>Pre-spilling using interval graphs (M.Sc. Project)</i>
C. Lapkowski	94-97	M.Sc.	<i>Symbolic Dependence Tests and Extended SSA Numbering</i>
Guirlyn Olivar	95-97	M.Sc.	<i>Fast Points-to Analysis for McCAT (M.Sc. Project)</i>
Shereen Ghobrial	95-97	M.Sc.	<i>Shared Variables in EARTH-C</i>
Jean M. Roque	94-95	M.Sc.	<i>Implementation of Independent Loops in High Performance C (co-supervised)</i>
Yingwei Zhang	93-95	M.Sc.	<i>Instruction Scheduling and Register Allocation for the McCAT Compiler</i>
Ana Maria Erosa	93-95	M.Sc.	<i>A Goto-elimination Method and its Implementation for the McCAT C Compiler</i>
Justiani	93-95	M.Sc.	<i>A Practical Array Dependence Analysis for an Optimizing/Parallelizing C Compiler</i>
Jing Wu	91-95	M.Sc.	<i>A Parallel Flow Analysis Method on Structured Programming Languages</i>
Rakesh Ghiya	93-95	M.Sc.	<i>Practical Techniques for Interprocedural Heap Analysis</i>
Chris Donawa	92-94	M.Sc.	<i>The Design and Implementation of a Structured Backend for the McCAT C Compiler</i>
Maryam Emami	91-93	M.Sc.	<i>A Practical Interprocedural Alias Analysis for an Optimizing/Parallelizing C Compiler</i>
Sumithra Jagannath	90-92	M.Sc.	<i>Measuring Dynamic Program Characteristics (M.Sc. Project)</i>
Matilda Leung	90-92	M.Sc.	<i>The Design and Implementation of the LAST Interpreter (M.Sc. Project)</i>
Weiren Ding	90-92	M.Sc.	<i>SELSYN-C: A Self-Synchronizing Parallel Programming Language</i>
Bhama Sridharan	90-92	M.Sc.	<i>An Analysis Framework for the McCAT Compiler</i>
ZhiPing Qiu	89-92	M.Sc.	<i>The Design and Implementation of a Compiler for Conformance Testing</i>

Administrative Duties

Current Administrative Duties

- Member of the Women@SOCS committee, 2006 to present.
- Member of the ad-hoc committee on undergraduate enrollment and recruitment, 2011 to present.
- Associate Dean (Academic), Faculty of Science. 2005 to present.
- Member of the Academic Policy Committee, 2011 to present.
- Member of the Faculty of Science Council of Chairs, 2005 to present.
- Vice-chair and organizer of the Academic Committee, 2005 to present.

Past Administrative Duties

- Member of McGill University Senate, 2008-2010.
- Associate Dean (Academic), Faculty of Science, Sept. 2005 to Aug. 2010. (Associated duties: Member of the Council of Chairs, Vice-chair of the Academic Committee, member of the University site-licensing group, Member of the University Admissions Committee (until 2009), Member of the B.A.&Sc. PAC (Chair on alternate years), Member of the Joint Faculty of Education and Faculty of Science Committee).
- Member of the Tenure and Reappointments Committee, School of Computer Science, 2003 to 2009.
- Chair, Ad-hoc committee on undergraduate enrollment and recruitment, 2007 to 2009.
- Member of the SOCS Advisory Committee, 2006-07.
- Chair of the Work Group on Womens' Academic Careers, Faculty of Science, 2004-2006.
- Member of Ph.D. Committee, School of Computer Science, 2004-2005.
- Member of Software Engineering Committee, School of Computer Science, 2004-2005.
- Member of the Recruiting Committee, School of Computer Science, July 1997 to 2005.
- Chair of the Software Engineering Committee, School of Computer Science, 2002-2003.
- Member of the Faculty of Science Committee on Student Standing, 2002-2003.
- Member of the Faculty of Science Tenure Committee, 1999-2004.
- Member of the Faculty of Science, Leo Yaffe Award Committee. (Decides upon the the recipient for the Leo Yaffe Award, given to the best teacher in the Faculty of Science), 1999-2001.

- Member of the Undergraduate Committee, School of Computer Science, July 1999 to August 2002.
- Member of the M.Sc. Committee, January 1999-June 1999.
- Chair of the School of Computer Science Space Allocation Committee, July 1997 to September 1998.
- Chair of the Committee on Women in Engineering, Sept 1995 to July 1996.
- Member of the Board of the McGill Centre for Research and Teaching on Women (Faculty of Engineering Representative), Sept 1994 to August 1995.
- Member of the Academic Committee, Faculty of Engineering, September 1994 to July 1996.
- Member of the Academic Committee, Faculty of Science, September 1992 to October 1993.
- Member of the Administration/MAUT Joint Committee on Intellectual Property (Software Sub-committee), March 1992 to October 1993.
- Co-chair of the Undergraduate Committee, School of Computer Science, June 1991 to July 1995.
- Member of the Undergraduate Committee, September 1990 to September 1998.
- Chair of the Minor Program in Computer Science (Arts, Science, and Engineering), September 1990 to September 1998.
- Member of the Ad-hoc Committee on Women in Engineering, September 1990 to June 1991.

Professional Activities

Program Chairs

I have been the Program Chair of the two major international compiler conferences. I believe that I am the only Canadian to have been Program Chair of both of them. Given the importance of conferences in my field it is a challenging job which is given to the leaders in the field.

- Program Committee Chair, International Conference on Compiler Construction, (CC 2008), 2007-2008.
- Program Committee Chair, SIGPLAN 2002 Conference on Programming Language Design and Implementation (PLDI '02), 2002.

Program Committee Memberships

I been a program committee member on all of the big ACM conferences in my field and related fields. Program committee membership usually involves serious reviewing of 15-30 papers, reacting to author responses, and participating in a program committee meeting which is used to choose the papers to accept.

- TACAS 2013, International Conference on Tools and Algorithms for the Construction and Analysis of Systems, member of the Program Committee.
- ISSTA 2012, International Symposium on Software Testing and Analysis, member of the Program Committee.
- ACM PLDI 2012, International Conference on Programming Language Design and Implementation, member of the Program Committee.
- ACM OOPSLA 2011, International Conference on Object-Oriented Programming, Systems, Languages and Applications, member of the External Review Committee.
- ACM ASPLOS 2011, Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '11), member of the External Review Committee.
- International Conference on Compiler Construction, (CC 2010).
- ACM ASPLOS 2010 Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '10).
- ACM SIGPLAN 2009 Conference on Programming Language Design and Implementation (PLDI '09).
- ACM SIGPLAN 2008 International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA 2008).
- Seventh ACM SIGPLAN-SIGSOFT Workshop on Program Analysis for Software Tools and Engineering (PASTE 2007).
- Sixth International Conference on Aspect-Oriented Software Development, (AOSD 2007).
- ACM SIGPLAN 2006 Conference on Programming Language Design and Implementation (PLDI '06).
- ACM International Symposium on Memory Management (ISMM '04), 2004.
- 2nd eclipse Technology eXchange workshop (eTX), a satellite event of ETAPS 2004.
- ACM SIGPLAN-SIGACT Symposium on the Principles of Programming Languages (POPL '02), 2002.
- International Static Analysis Symposium (SAS '01), 2001.
- Co-organizer of the Dagstuhl Seminar 451, Effective Implementation of Object Oriented Programming Languages, November 2000.
- ACM SIGPLAN 2000 Conference on Programming Language Design and Implementation (PLDI '00), 2000.
- IWAOOS '99 (Intercontinental Workshop on Aliasing in Object-Oriented Systems), co-located with ECOOP (European Conference on Object-Oriented Programming), 1999.

- ACM SIGPLAN-SIGACT Symposium on the Principles of Programming Languages (POPL '99), 1999.
- International Static Analysis Symposium (SAS '98), 1998.
- Seventh IEEE International Conference on Computer Languages, 1998.
- 12th Annual International Symposium on High Performance Computing Systems and Applications (HPCS '98), 1998.
- International Static Analysis Symposium (SAS '97), 1997.
- ACM SIGPLAN-SIGACT Symposium on the Principles of Programming Languages (POPL '97), 1997.
- ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI '95), 1995.
- International Conference on Compiler Construction, 1994.
- Fifth IEEE International Conference on Computer Languages, 1994.
- ATABLE '92, The Second International Workshop on Array Structures, 1992.

Reviewer - Journals

- ACM Transactions on Programming Languages and Systems
- The Journal of Parallel and Distributed Computing
- ACM Letters on Programming Languages and Systems
- Parallel Computing
- The Journal of Programming Languages
- IEEE Transactions on Parallel and Distributed Systems
- IEEE Transactions of Software Engineering
- IEEE Proceedings on Supercomputer Technology
- Parallel Processing Letters
- Information Processing Letters

Reviewer - Conferences

- Micro-32, 32nd Annual International Symposium on Microarchitecture, 1999.
- The 11th Annual International Symposium on High Performance Computing Systems
- Symposium on Parallel and Distributed Processing
- ACM International Conference on Architectural Support for Programming Languages and Operating Systems (sponsored by the ACM and in cooperation with the IEEE Computer Society).
- ACM International Conference on Supercomputing
- PARLE (Parallel Architectures and Languages Europe)
- ACM SIGPLAN Conference on Programming Languages and Implementation
- CONPAR92-VAPP V
- IEEE International Conference on Computer Languages
- International Conference on Distributed Computing Systems
- 17th Annual International Symposium on Computer Architecture
- International Conference of Parallel Processing
- Workshop on Languages and Compilers for Parallel Architectures
- CASCON

Other Professional Activities

- Member and Fellow ACM, and ACM SIGPLAN.
- Reviewer of grant proposals for: NSERC (CANADA), FCAR (Quebec), INRIA (France), and NSF (USA).
- Past Member of the CC and ETAPS steering committees.
- Past Member of the PLDI steering committee.
- Past member of the Professional Activities Committee of SIGPLAN (ACM).
- Past Member of IEEE, IEEE Computer Society
- Member of the Appointments Board for the School of Mathematical and Computing Sciences, Chalmers University of Technology and Gothenburg University, Sweden, 1997.