

Curriculum Vitae of Robert James Walker

Associate Professor
Department of Computer Science
University of Calgary

EDUCATION

Doctor of Philosophy, Department of Computer Science, University of British Columbia, March 2003. Thesis: *Essential Software Structure through Implicit Context*. Supervisor: Dr. Gail C. Murphy.

Master of Science, Department of Computer Science, University of British Columbia, November 1996. Thesis: *Integrating Simulation and Animation Software Systems through a Generic Computational Engine*. Supervisor: Dr. David R. Forsey.

Bachelor of Science, Computer Science Honours Program, University of British Columbia, June 1994. Thesis: *SPAM Prototype Implementation*. Supervisor: Dr. David R. Forsey.

Bachelor of Science, Geophysics Major Program, University of British Columbia, June 1992.

PROFESSIONAL EXPERIENCE

Associate Professor, Department of Computer Science, University of Calgary, July 2007–present.

Assistant Professor, Department of Computer Science, University of Calgary, July 2002–June 2007.

Software Engineering Consultant, Graduate Student Society, University of British Columbia, 2000–2002.

Sessional Instructor, Department of Computer Science, University of British Columbia, Summer 2000.

Intern, IBM T.J. Watson Research Center (Hawthorne, NY, USA), Summer 1998. Manager: Dr. Harold Ossher.

Visitor, Software Engineering Laboratory, Institute for Information Technology, National Research Council (Ottawa, Canada), Summer 1997.

RESEARCH

Publications

(Co-authors who were supervised or co-supervised by me during any part of the research are indicated by underlining.)

Peer-reviewed book chapters

Siobhán Clarke and **Robert J. Walker**. Generic aspect-oriented design with Theme/UML. Chapter 19 in Robert E. Filman et al., editors, *Aspect-Oriented Software Development*, Addison-Wesley, September 2004. 34 pages.

Robert J. Walker, Elisa L. A. Baniassad, and Gail C. Murphy. An initial assessment of aspect-oriented programming. Chapter 23 in Robert E. Filman et al., editors, *Aspect-Oriented Software Development*, Addison-Wesley, September 2004. 26 pages.

Peer-reviewed journal papers

Reid Holmes, **Robert J. Walker**, and Gail C. Murphy. Approximate structural context matching: An approach to recommend relevant examples. *IEEE Transactions on Software Engineering*, 32(12):952–970, December 2006. DOI: [10.1109/TSE.2006.117](https://doi.org/10.1109/TSE.2006.117).

Gail C. Murphy, **Robert J. Walker**, Elisa L. A. Baniassad, Martin P. Robillard, Albert Lai, and Mik A. Kersten. Does aspect-oriented programming work? *Communications of the ACM*, Special Issue on Aspect-Oriented Programming, 44(10):75–77, October 2001. DOI: [10.1145/383845.383862](https://doi.org/10.1145/383845.383862).

Gail C. Murphy, **Robert J. Walker**, and Elisa L. A. Baniassad. Evaluating emerging software development technologies: Lessons learned from assessing aspect-oriented programming. *IEEE Transactions on Software Engineering*, 25(4):438–455, July/August 1999. Special Section on Empirical Software Engineering. DOI: [10.1109/32.799936](https://doi.org/10.1109/32.799936).

Peer-reviewed conference papers (research track)

Reid Holmes, Rylan Cottrell, **Robert J. Walker**, and Jörg Denzinger. The end-to-end use of source code examples: An exploratory study. In *Proceedings of the 2009 IEEE International Conference on Software Maintenance (ICSM 2009)*, 2009. In press, 4 pages. [40% acceptance].

Rylan Cottrell, **Robert J. Walker**, and Jörg Denzinger. Semi-automating small-scale source code reuse via structural correspondence. In *Proceedings of the 16th ACM SIGSOFT International Symposium on the Foundations of Software Engineering (SIGSOFT '08/FSE-16)*, pages 214–225, 2008. DOI: [10.1145/1453101.1453130](https://doi.org/10.1145/1453101.1453130) [20% acceptance].

Reid Holmes and **Robert J. Walker**. Lightweight, semi-automated enactment of pragmatic-reuse plans. In *Proceedings of the International Conference on Software Reuse (ICSR '08) [High Confidence Software Reuse in Large Systems]*, volume 5030 of *Lecture Notes in Computer Science*, Springer, pages 330–342, 2008. DOI: [10.1007/978-3-540-68073-4_35](https://doi.org/10.1007/978-3-540-68073-4_35) [26% acceptance].

Mark McIntyre and **Robert J. Walker**. Assisting potentially-repetitive small-scale changes via semi-automated heuristic search. In *Proceedings of the ACM/IEEE International Conference on Automated Software Engineering*, pages 497–500, 2007. DOI: [10.1145/1321631.1321718](https://doi.org/10.1145/1321631.1321718) [25% acceptance].

Bradley E. Cossette and **Robert J. Walker**. Polylingual dependency analysis using island grammars: A cost versus accuracy evaluation. In *Proceedings of the International Conference on Software Maintenance (ICSM '07)*, pages 214–223, 2007. DOI: [10.1109/ICSM.2007.4362634](https://doi.org/10.1109/ICSM.2007.4362634) [21% acceptance].

Rylan Cottrell, Joseph J. C. Chang, **Robert J. Walker**, and Jörg Denzinger. Determining detailed structural correspondence for generalization tasks. In *Proceedings of the European Software Engineering Conference held jointly with the ACM SIGSOFT International Symposium on Foundations of Software Engineering (ESEC/FSE '07)*, pages 165–174, 2007. DOI: [10.1145/1287624.1287649](https://doi.org/10.1145/1287624.1287649) [17% acceptance].

Reid Holmes and **Robert J. Walker**. Supporting the investigation and planning of pragmatic reuse tasks. In *Proceedings of the 29th International Conference on Software Engineering (ICSE '07)*, pages 447–457, 2007. DOI: [10.1109/ICSE.2007.83](https://doi.org/10.1109/ICSE.2007.83) [15% acceptance].

Jamal Siadat, **Robert J. Walker**, and Cameron Kiddle. Optimization aspects in network simulation. In *Proceedings of the 5th International Conference on Aspect-Oriented Software Development (AOSD '06)*, pages 122–133, 2006. DOI: [10.1145/1119655.1119673](https://doi.org/10.1145/1119655.1119673) [21% acceptance].

Robert J. Walker and Kevin Viggers. Implementing protocols via declarative event patterns. In *Proceedings of the ACM SIGSOFT International Symposium on the Foundations of Software Engineering (SIGSOFT '04/FSE-12)*, pages 159–169, 2004. DOI: [10.1145/1029894.1029918](https://doi.org/10.1145/1029894.1029918) [15% acceptance].

Siobhán Clarke and **Robert J. Walker**. Towards a standard design language for AOSD. In *Proceedings of the First International Conference on Aspect-Oriented Software Development (AOSD '02)*, pages 113–119, 2002. DOI: [10.1145/508386.508400](https://doi.org/10.1145/508386.508400) [34% acceptance].

Gail C. Murphy, Albert Lai, **Robert J. Walker**, and Martin P. Robillard. Separating features in source code: An exploratory study. In *Proceedings of the 23rd International Conference on Software Engineering (ICSE-23)*, pages 275–284, 2001. DOI: [10.1109/ICSE.2001.919101](https://doi.org/10.1109/ICSE.2001.919101) [18% acceptance].

Siobhán Clarke and **Robert J. Walker**. Composition patterns: An approach to designing reusable aspects. In *Proceedings of the 23rd International Conference on Software Engineering (ICSE-23)*, pages 5–14, 2001. DOI: [10.1109/ICSE.2001.919076](https://doi.org/10.1109/ICSE.2001.919076) [18% acceptance].

Robert J. Walker and Gail C. Murphy. Implicit context: Easing software evolution and reuse. In *Proceedings of the ACM SIGSOFT Eighth International Symposium on the Foundations of Software Engineering (SIGSOFT 2000/FSE-8)*, pages 69–78, 2000. DOI: [10.1145/355045.355054](https://doi.org/10.1145/355045.355054) [18% acceptance].

Robert J. Walker, Gail C. Murphy, Jeffrey Steinbok, and Martin P. Robillard. Efficient mapping of software system traces to architectural views. In *Proceedings of the 2000 Conference of the IBM Centre for Advanced Studies on Collaborative Research (CASCON 2000)*, pages 31–40, 2000. DOI: [10.1145/782034.782046](https://doi.org/10.1145/782034.782046) [36% acceptance].

Robert J. Walker, Elisa L. A. Baniassad, and Gail C. Murphy. An initial assessment of aspect-oriented programming. In *Proceedings of the 21st International Conference on Software Engineering (ICSE-21)*, pages 120–130, 1999. DOI: [10.1145/302405.302458](https://doi.org/10.1145/302405.302458) [18% acceptance].

Robert J. Walker and Jack Snoeyink. Practical point-in-polygon tests using CSG representations of polygons. In Michael T. Goodrich and Catherine C. McGeoch, editors, *Algorithm Engineering and Experimentation. Proceedings of the First International Symposium (ALENEX '99)*, volume 1619 of *Lecture Notes in Computer Science*, pages 114–123, 1999. DOI: [10.1007/3-540-48518-X_7](https://doi.org/10.1007/3-540-48518-X_7) [48% acceptance].

Robert J. Walker, Gail C. Murphy, Bjorn Freeman-Benson, Darin Wright, Darin Swanson, and Jeremy Isaak. Visualizing dynamic software system information through high-level models. In *Proceedings of the ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA '98)*, pages 271–283, 1998. DOI: [10.1145/286936.286966](https://doi.org/10.1145/286936.286966) [19% acceptance].

Paul Lalonde, **Robert Walker**, Jason Harrison, and David Forsey. A model for coordinating interacting agents. In *Proceedings of Graphics Interface (GI '94)*, pages 149–156, 1994. [30% acceptance]

Peer-reviewed conference papers (research demonstration track)

Reid Holmes and **Robert J. Walker**. Semi-automating pragmatic reuse tasks. In *Proceedings of the ACM/IEEE International Conference on Automated Software Engineering (ASE '08)*, pages 481–482, 2008. Research demonstration track. DOI: [10.1007/978-3-540-68073-4_35](https://doi.org/10.1007/978-3-540-68073-4_35) [47% acceptance].

Rylan Cottrell, **Robert J. Walker**, and Jörg Denzinger. Jigsaw: A tool for small-

scale source code reuse. In *Companion of the International Conference on Software Engineering* (ICSE '08), pages 933–934, 2008. Informal research demonstration. DOI: [10.1145/1370175.1370194](https://doi.org/10.1145/1370175.1370194) [60% acceptance].

Reid Holmes, **Robert J. Walker**, and Gail C. Murphy. Strathcona example recommendation tool. In *Proceedings of the Joint European Software Engineering Conference and ACM SIGSOFT International Symposium on the Foundations of Software Engineering* (ESEC/FSE '05), pages 237–240, 2005. Research demonstration track. DOI: [10.1145/1081706.1081744](https://doi.org/10.1145/1081706.1081744) [38% acceptance].

Peer-reviewed workshop papers

Rylan Cottrell, Brina Goyette, Reid Holmes, **Robert J. Walker**, and Jörg Denzinger. Compare and contrast: Visual exploration of source code examples. In *Proceedings of the 5th IEEE International Workshop on Visualizing Software for Understanding and Analysis* (VISSOFT '09), 2009. In press, 4 pages.

Reid Holmes and **Robert J. Walker**. Developer-specific awareness of external changes. In *2009 Workshop on Socio-technical Congruence* at the International Conference on Software Engineering, 2009. 4 pages.

Reid Holmes and **Robert J. Walker**. A newbie's guide to Eclipse APIs. In *Proceedings of the Working Conference on Mining Software Repositories* (MSR '08), pages 149–152, 2008. DOI: [10.1145/1370750.1370787](https://doi.org/10.1145/1370750.1370787).

Reid Holmes and **Robert J. Walker**. Promoting developer-specific awareness. In *Proceedings of the 2008 International Workshop on Cooperative and Human Aspects of Software Engineering* (CHASE '08), International Conference on Software Engineering, pages 61–64, 2008. DOI: [10.1145/1370114.1370130](https://doi.org/10.1145/1370114.1370130).

Reid Holmes and **Robert J. Walker**. Informing Eclipse API production and consumption. In *Proceedings of the Eclipse Technology Exchange* (eTX '07), pages 70–74, 2007. ACM Digital Library. [Best Presentation Award] DOI: [10.1145/1328279.1328294](https://doi.org/10.1145/1328279.1328294).

Reid Holmes and **Robert J. Walker**. Task-specific source code dependency investigation. In *Proceedings of the 4th IEEE International Workshop on Visualizing Software for Understanding and Analysis* (VISSOFT '07), pages 100–107, 2007. DOI: [10.1109/VISSOF.2007.4290707](https://doi.org/10.1109/VISSOF.2007.4290707) [44% acceptance].

Joseph J. C. Chang and **Robert J. Walker**. Incomplete resolution of references in Eclipse. In *Proceedings of the Eclipse Technology Exchange* (eTX '05), ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications, pages 5–9, 2005. DOI: [10.1145/1117696.1117697](https://doi.org/10.1145/1117696.1117697) [57% acceptance].

Robert J. Walker, Reid Holmes, Ian Hedgeland, Puneet Kapur, and Andrew Smith. A lightweight approach to technical risk estimation via probabilistic impact analysis. In *Proceedings of the 3rd International Workshop on Mining Software Repositories* (MSR '06), 28th International Conference on Software Engineering, pages 98–104, 2006. DOI: [10.1145/1137983.1138008](https://doi.org/10.1145/1137983.1138008) [36% acceptance].

Robert J. Walker. Supporting inconsistent world views. In *Proceedings of the Workshop on Software Engineering Principles of Languages for Aspect Technologies* (SPLAT '03), 2nd International Conference on Aspect-Oriented Software Development, 2003. 5 pages.

Siobhán Clarke and **Robert J. Walker**. Mapping composition patterns to AspectJ and Hyper/J. In *Proceedings for Advanced Separation of Concerns Workshop*, 23rd International Conference on Software Engineering, pages 18–26, 2001.

Robert J. Walker and Gail C. Murphy. Joinpoints as ordered events: Towards applying implicit context to aspect-orientation. In *Proceedings for Advanced Sepa-*

ration of Concerns Workshop, 23rd International Conference on Software Engineering, pages 134–139, 2001.

Albert Lai, Gail C. Murphy, and **Robert J. Walker**. Separating concerns with Hyper/J: An experience report. In *Workshop Proceedings: Multi-dimensional Separation of Concerns in Software Engineering*, 22nd International Conference on Software Engineering, pages 79–91, 2000.

Robert J. Walker and Gail C. Murphy. Dynamic contextual reflection: A mechanism for software evolution and reuse. In *Proceedings of the OOPSLA '99 Workshop on Reflection and Software Engineering (OORASE '99)*, ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications, pages 43–50, 1999.

Peer-reviewed abstracts

Robert J. Walker. Performing and reviewing assessments of contemporary modularization approaches: What constitutes reasonable expectations? In *Proceedings of the 1st Workshop on the Assessment of Contemporary Modularization Approaches (ACoM '07)*, 29th International Conference on Software Engineering, 2007. ACM Digital Library, 2 pages. DOI: [10.1109/ACOM.2007.8](https://doi.org/10.1109/ACOM.2007.8).

Robert J. Walker. Contextual programming. In *Proceedings of the 21st International Conference on Software Engineering (ICSE-21)*, pages 734–735, 1999. Doctoral symposium. DOI: [10.1145/302405.303004](https://doi.org/10.1145/302405.303004) [25% acceptance].

Robert J. Walker, Elisa L. A. Baniassad, and Gail C. Murphy. Assessing aspect-oriented programming and design: Preliminary results. In Serge Demeyer and Jan Bosch, editors, *Object-Oriented Technology: ECOOP '98 Workshop Reader*, volume 1543 of *Lecture Notes in Computer Science*, pages 433–434, 1998. Presented at the Aspect-Oriented Programming Workshop, 12th European Conference on Object-Oriented Programming, 1998. DOI: [10.1007/3-540-49255-0_131](https://doi.org/10.1007/3-540-49255-0_131).

Robert J. Walker and Jack Snoeyink. Using CSG representations of polygons for practical point-in-polygon tests. In *SIGGRAPH '97 Visual Proceedings*, page 125, 1997. Technical sketch. DOI: [10.1145/259081.259239](https://doi.org/10.1145/259081.259239) [47% acceptance].

Summaries and proceedings

Martin Robillard, **Robert J. Walker**, and Thomas Zimmermann. *Proceedings of the 2008 International Workshop on Recommendation Systems for Software Engineering*, 16th ACM SIGSOFT International Symposium on Foundations of Software Engineering, 2008. ACM Digital Library.

Alessandro Garcia, Phil Greenwood, George Heineman, **Robert Walker**, Yuafang Cai, Hong Yul Yang, Elisa Baniassad, Cristina Videira Lopes, Christa Schwanninger, and Jianjun Zhao. Assessment of contemporary modularization techniques—ACoM'07: Workshop report. *Software Engineering Notes*, 32(5), September 2007. 8 pages. DOI: [10.1145/1290993.1291005](https://doi.org/10.1145/1290993.1291005).

Robert J. Walker, Lionel C. Briand, David Notkin, Carolyn B. Seaman, and Walter F. Tichy. Empirical validation: What, why, when, and how. In *Proceedings: 25th International Conference on Software Engineering (ICSE-25)*, pages 721–722, 2003. DOI: [10.1145/776816.776922](https://doi.org/10.1145/776816.776922).

Non-peer-reviewed conference and workshop papers

Robert J. Walker, Elisa L. A. Baniassad, and Gail C. Murphy. Assessing aspect-oriented programming and design: Preliminary Results. In *Proceedings of the International Workshop on Aspect-Oriented Programming*, 20th International Con-

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ference on Software Engineering, 1998. 6 pages.

Rob Walker. Information engineering on the World-Wide Web: Drawing analogies with software engineering. In *Proceedings of the Eighth Western Computer Graphics Symposium*, pages 97–107, 1997.

Non-peer-reviewed technical reports

Reid Holmes, Rylan Cottrell, **Robert J. Walker**, and Jörg Denzinger. *The end-to-end use of source code examples: An exploratory study—Appendix*. Technical report 2009-934-13, Department of Computer Science, University of Calgary, Canada, June 2009. 8 pages.

Robert J. Walker, Reid Holmes, Ian Hedgeland, Puneet Kapur, and Andrew Smith. *A Lightweight Approach to Technical Risk Estimation via Probabilistic Impact Analysis*. Technical report 2006-817-10, Department of Computer Science, University of Calgary, Calgary, Canada, February 2006. 8 pages. DOI: [1880/46089](https://doi.org/10.1112/j.1880-4608.2006.00089.x).

Jamal Siadat, **Robert J. Walker**, and Cameron Kiddle. *Optimization Aspects in Network Simulation*. Technical report 2005-802-33, Department of Computer Science, University of Calgary, Calgary, Canada, September 2005. 12 pages. DOI: [1880/46088](https://doi.org/10.1112/j.1880-4608.2005.00088.x).

Shafquat Mahmud and **Robert J. Walker**. *A Case Study in Simulated Concurrent Development and Evolution: Investigating the Theme Approach*. Technical report 2004-765-30, Department of Computer Science, University of Calgary, Calgary, Canada, October 2004. 12 pages. DOI: [1880/46087](https://doi.org/10.1112/j.1880-4608.2004.00087.x).

Robert J. Walker. *IconJ 0.1: A Proof-of-Concept Tool for the Application of the Implicit Context Model to Java Software*. Technical report 2004-757-22, Department of Computer Science, University of Calgary, August 2004. 50 pages. DOI: [1880/46086](https://doi.org/10.1112/j.1880-4608.2004.00086.x).

Kevin Viggers and **Robert J. Walker**. *An Implementation of Declarative Event Patterns*. Technical report 2004-745-10, Department of Computer Science, University of Calgary, Calgary, Canada, December 2004. 34 pages. DOI: [1880/46085](https://doi.org/10.1112/j.1880-4608.2004.00085.x).

Robert J. Walker and Kevin Viggers. *Communication History Patterns: Direct Implementation of Protocol Specifications*. Technical report 2004-736-01, Department of Computer Science, University of Calgary, Calgary, Canada, February 2004. 13 pages. DOI: [1880/46084](https://doi.org/10.1112/j.1880-4608.2004.00084.x).

Siobhán Clarke and **Robert J. Walker**. *Separating Crosscutting Concerns Across the Lifecycle: From Composition Patterns to AspectJ and Hyper/J*. Technical report TCD-CS-2001-15, Trinity College, Dublin, Ireland, 2001. 13 pages

Robert J. Walker, Gail C. Murphy, Jeffrey Steinbok, and Martin P. Robillard. *Efficient Mapping of Software System Traces to Architectural Views*. Technical report TR-00-09, Department of Computer Science, University of British Columbia, Vancouver, Canada, July 2000. 9 pages.

Robert J. Walker. *Eliminating Cycles from Composed Class Hierarchies*. Technical report TR-2000-07, Department of Computer Science, University of British Columbia, Vancouver, Canada, July 2000. 11 pages.

Robert J. Walker and Gail C. Murphy. *Using Implicit Context to Ease Software Evolution and Reuse*. Technical report TR-99-13, Department of Computer Science, University of British Columbia, Vancouver, Canada, November 1999. 11 pages.

Robert J. Walker and Jack Snoeyink. *Practical Point-in-Polygon Tests Using*

CSG Representations of Polygons. Technical report TR-99-12, Department of Computer Science, University of British Columbia, Vancouver, Canada, November 1999. 22 pages.

Robert J. Walker, Elisa L. A. Baniassad, and Gail C. Murphy. *An Initial Assessment of Aspect-Oriented Programming*. Technical report TR-98-12, Department of Computer Science, University of British Columbia, Vancouver, Canada, September 1998. 10 pages.

Gail C. Murphy, **Robert J. Walker**, and Elisa L. A. Baniassad. *Evaluating Emerging Software Development Technologies: Lessons Learned from Assessing Aspect-oriented Programming*. Technical report TR-98-10, Department of Computer Science, University of British Columbia, Vancouver, Canada, July 1998. 31 pages.

Robert J. Walker, Elisa L. A. Baniassad, and Gail C. Murphy. *Assessing Aspect-Oriented Programming and Design: Preliminary Results*. Technical report TR-98-03, Department of Computer Science, University of British Columbia, Vancouver, Canada, April 1998.

Presentations

Jigsaw: A tool for small-scale source code reuse. International Conference on Software Engineering (ICSE '08), informal research demonstration, 2008.

Performing and reviewing assessments of contemporary modularization approaches: What constitutes reasonable expectations? 1st Workshop on the Assessment of Contemporary Modularization Approaches (ACoM '07), 29th International Conference on Software Engineering, 2007.

Incomplete resolution of references in Eclipse. Eclipse Technology Exchange (eTX '05), ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications, 2005.

Towards Large-Scale Reuse, IBM Ottawa Centre for Advanced Studies, Ottawa, Canada, 22 September 2005. Invited presentation.

Technical Risk of Change: Practical Assessment, Chartwell Technologies, Inc., Calgary, Canada, 24 May 2005. Invited presentation.

Implementing protocols via declarative event patterns. ACM SIGSOFT International Symposium on the Foundations of Software Engineering, 2004.

Aspect-Oriented Programming: Increasing Flexibility or Increasing Headaches? Calgary Agile Methods User Group, Calgary, 2 March 2004. Invited presentation.

Supporting inconsistent world views. Workshop on Software Engineering Principles of Languages for Aspect Technologies (SPLAT '03), 2nd International Conference on Aspect-Oriented Software Development, 2003.

Joinpoints as ordered events: Towards applying implicit context to aspect-orientation. Advanced Separation of Concerns Workshop, 23rd International Conference on Software Engineering, 2001.

Implicit context: Easing software evolution and reuse. ACM SIGSOFT Eighth International Symposium on the Foundations of Software Engineering (SIGSOFT 2000/FSE-8), 2000.

Efficient mapping of software system traces to architectural views. Conference of the IBM Centre for Advanced Studies on Collaborative Research (CASCON 2000), 2000.

Contextual programming. Doctoral Symposium, 21st International Conference on Software Engineering (ICSE-21), 1999.

Dynamic contextual reflection: A mechanism for software evolution and reuse. Workshop on Reflection and Software Engineering (OORASE '99), ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA '99), 1999.

Visualizing dynamic software system information through high-level models. ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA '98), 1998.

Using CSG representations of polygons for practical point-in-polygon tests. ACM SIGGRAPH International Conference on Computer Graphics and Interactive Technologies, 1997. Technical sketch.

Information engineering on the World-Wide Web: Drawing analogies with software engineering. Eighth Western Computer Graphics Symposium, 1997.

Grants

R. J. Walker. *Unanticipated Reuse.* Natural Sciences and Engineering Research Council, Discovery Grant, \$22,300/yr., 2008–2013.

R. J. Walker. *Three Steps Towards Unanticipated Large-Scale Software Use/Reuse.* Natural Sciences and Engineering Research Council, Collaborative Research and Development Grant, \$77,600, 2006–2008. One industrial partner.

G. H. Ruhe, B. H. Far, F. O. Maurer, **R. J. Walker.** *Intelligent Support for Release and Design Decisions of Evolvable Software-Intensive Systems.* Natural Sciences and Engineering Research Council, Collaborative Research and Development Grant, \$150,000/yr. (33% share), 2005–2008. Two industrial partners.

R. J. Walker. *Easing Software Evolution and Reuse through Efficient Context Insensitivity.* Natural Sciences and Engineering Research Council, Discovery Grant, \$21,000/yr., 2003–2008.

R. J. Walker and E. Stroulia. *Meaning-Preserving Transformation for Context Insensitivity.* Alberta Software Engineering Research Consortium, Collaboration Grant, \$14,800, 2002–2003.

R. J. Walker. *A Formal and Efficient Basis for Communication History.* University of Calgary, Research Grant, \$10,000, 2002–2003.

Awards

IBM Faculty Award. *Use and Reuse: Real-Time Example Generation and External-Constraint Analysis.* IBM Canada Inc., US\$23,500, 2005.

TEACHING

Current supervision

Current graduate supervision

Rylan Cottrell, Doctor of Philosophy student, September 2008–present. Project: Semi-automated large-scale reuse tasks. Queen Elizabeth II Scholarship. (Co-supervisor: Dr. Jörg Denzinger.)

Bradley E. Cossette, Doctor of Philosophy student, September 2008–present. Project: Technical risk estimation in polylingual systems. NSERC Postgraduate Scholarship (PGS D), and iCORE Post Graduate Scholarship.

Iftekhar A. Sadi, Master of Science student, September 2008–present. Project: Evolvability of logging aspects.

Soha H. Makady, Doctor of Philosophy student, September 2007–present. Pro-

ject: Partial reuse of test cases in unanticipated reuse scenarios. Dean's Entrance Scholarship.

M. Fahim Zibran, Doctor of Philosophy student, September 2007–present. Project: API usability. NSERC Postgraduate Scholarship (PGS D). (Co-supervisor: Dr. Jonathan Sillito.)

Puneet Kapur, Master of Science student, part-time, September 2006–August 2008; full-time, September 2008–present. Project: Refactoring support for unresolved references. NSERC Industrial Postgraduate Scholarship (IPGS), and iCORE Post Graduate Scholarship. Status: Senior developer at Chartwell Technology, Calgary.

J. Mark Dochstader, Master of Science (course-based program) student, part-time, January 2006–present.

Bhavya Rawal, Master of Science student, September 2005–present. Project: Using method similarity over versions to improve predictions based on change history.

Current graduate co-supervision

Craig Schock, Doctor of Philosophy student, September 2008–present, University of Waikato. Project: Network theory as an alternative to coupling and cohesion. (Supervisor: Dr. Ian Witten.) NSERC Alexander Graham Bell Canada Graduate Scholarship (CGS D).

Dane Bertram, Master of Science student, September 2007–present. Project: Persisting informal communications for better defect correction. (Supervisor: Dr. Saul Greenberg.) NSERC Alexander Graham Bell Canada Graduate Scholarship (CGS M), Alberta Ingenuity MSc Scholarship, and iCORE Post Graduate Scholarship.

Current graduate supervisory committees

Paul Gordon, Doctor of Philosophy student, September 2006–present. Project: End-user automation of bioinformatics workflows. Supervisory committee: July 2007–present.

Current undergraduate research assistant supervision

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Past supervision

Past graduate supervision

Reid Holmes, Doctor of Philosophy student, September 2004–December 2006; candidate, December 2006–November 2008. Thesis: *Pragmatic Software Reuse*. Ruby Anniversary Doctoral Scholarship and Queen Elizabeth II Scholarship; nominated for CAGS/UMI Distinguished Dissertation Award and John Kendall Doctoral Thesis Award. Status: Postdoctoral fellow at the University of Washington with Dr. David Notkin [NSERC Postdoctoral Fellowship].

Bradley E. Cossette, Master of Science student, January 2006–August 2008. Thesis: *Lightweight Support for Estimation of Polylingual Dependencies*. (Co-supervisor: Dr. Günther Ruhe.) NSERC Postgraduate Scholarship (PGS M), iCORE Post Graduate Scholarship, and Queen Elizabeth II Scholarship. Status: PhD student supervised by me.

Rylan Cottrell, Master of Science student, September 2005–August 2008. Thesis:

Semi-automating Small-Scale Source Code Reuse via Structural Correspondence. (Co-supervisor: Dr. Jörg Denzinger.) Status: PhD student supervised by me.

Joseph J. C. Chang, Master of Science student, January 2006–August 2008. Thesis: *Finding Relevant Starting Points with Source Code Indexes*. NSERC Canada Graduate Scholarship (CGS M) and iCORE Post Graduate Scholarship. Status: Developer at SMART Technologies, Calgary.

Mark M. McIntyre, Master of Science student, January 2004–September 2007. Thesis: *Supporting Repetitive Small-Scale Changes*. Status: Entrepreneur, Montréal.

S. Jamal A. Siadat, Master of Science student, January 2004–December 2006. Thesis: *An Evaluation of Simultaneous Evolvability and Efficiency in Aspect-Oriented Software Development*. Status: PhD student in Project Management at the University of Calgary, and Project Manager at Burntsand, Calgary.

Shafquat Mahmud, Master of Science student, September 2003–July 2006. Thesis: *When Should Crosscutting Concerns Be of Concern in the Software Development Lifecycle?* Status: Software Architect at Wairever Inc., Calgary.

Kevin Viggers, Master of Science student, September 2002–September 2005. Thesis: *Improving the Modularity of Context-Sensitive Concerns through the Use of Declarative Event Patterns*. Co-supervisor (supervisor: Dr. Claudio Costi): September 2002–December 2002. Sole supervisor: January 2003–September 2005. Status: Manager, Educational Software, at SMART Technologies, Calgary.

Past graduate co-supervision

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Past graduate supervisory committees

Moshood Omolade Saliu, Doctor of Philosophy student, September 2003–November 2005; candidate, November 2005–September 2007. Thesis: *Software Release Planning for Evolving Systems*. Supervisory committee: September 2004–September 2007.

Past undergraduate supervision

Puneet Kapur, Bachelor of Science student. Project: Metrics Maze: Determining code health through multivariate metrics analysis. Supervisor: January 2007–April 2007. Status: MSc student supervised by me, and Senior Developer at Chartwell Technology, Calgary.

M. Rhett Dickson, Bachelor of Engineering student. Project: An empirical evaluation of aspect-oriented design pattern evolvability. Supervisor: January 2007–April 2007. Status: Developer at CDL Systems Ltd., Calgary.

Lei Yu, Bachelor of Science (Honours) student. Project: Supporting identity inference in medieval Roman legal documents. Supervisor: September 2004–December 2004 (co-supervisor: Dr. Jörg Denzinger); co-supervisor: January 2005–March 2005 (supervisor: Dr. Jörg Denzinger).

Sarah Paul, Bachelor of Science student. Project: A canonical representation of intermodular dependencies for analysis of reuse and evolution. Supervisor: January 2003–May 2003.

Past undergraduate re-

Brina Goyette, Bachelor of Science student. Project: Hierarchical classification of

search assistant supervision

API usages. Supervisor: May 2007–July 2008. NSERC Undergraduate Summer Research Assistantship. [NSERC Alexander Graham Bell Canada Graduate Scholarship (CGS M), Jason Lang Scholarship, CSUS Schlumberger Award, Archie & Hugh Bogner Bursary.] Status: MS student at Carnegie Mellon University.

Travis Meier, Bachelor of Science student. Project: Web-based presentation of technical risk estimation. Supervisor: May 2007–August 2007.

Alain Maillot, Bachelor of Engineering. Project: Web-based presentation of technical risk estimation. Supervisor: May 2007–June 2007. Status: Developer at Microsoft, Redmond, USA.

Puneet Kapur, Bachelor of Science student. Project: Incorporating cost into technical risk estimates. Supervisor: May 2006–August 2006. NSERC Undergraduate Summer Research Assistantship. Status: MSc student supervised by me, and senior developer at Chartwell Technology, Calgary.

M. Rhett Dickson, Bachelor of Engineering student. Project: Evaluating the evolvability of aspect-oriented software. Supervisor: May 2006–August 2006. NSERC Undergraduate Summer Research Assistantship. Status: Developer at CDL Systems Ltd., Calgary.

Ian Hedgeland, Bachelor of Engineering. Project: Technical risk assessment via repository mining. Supervisor: May 2005–August 2005. Status: Developer at Schlumberger, Calgary.

Joseph Chang, Bachelor of Engineering. Project: IConJ redevelopment. Supervisor: May 2005–August 2005. Status: Developer at SMART Technologies, Calgary.

Shannon Jaeger, Bachelor of Science. Project: External constraint graphs. Supervisor: September 2003–June 2004.

Keith Kwong, Bachelor of Science. Project: IConJ redevelopment. Supervisor: May 2003–August 2003.

Examination committees

Xiaozhen (Jean) Cao, Doctor of Philosophy thesis defence, December 2008. Thesis: *Improving Multimedia Streaming Scalability in Wireless LANs*. Internal examiner.

Reid Holmes, Doctor of Philosophy thesis defence, November 2008. Thesis: *Pragmatic Software Reuse*. Supervisor.

Kwun Kit Lo, Master of Philosophy thesis, Department of Computer Science and Engineering, Chinese University of Hong Kong, September 2008. Thesis: *Call Graph Reduction by Static Estimated Function Execution Probability*. External examiner.

«Name withheld», examination, September 2008.

Bradley E. Cossette, Master of Science thesis defence, August 2008. Thesis: *Lightweight Support for Estimation of Polylingual Dependencies*. Internal examiner.

Rylan Cottrell, Master of Science thesis defence, August 2008. Thesis: *Semi-automating Small-Scale Source Code Reuse via Structural Correspondence*. Internal examiner.

Joseph J.-C. Chang, Master of Science thesis defence, August 2008. Thesis: *Finding Relevant Starting Points with Source Code Indexes*. Internal examiner.

Paul Gordon, Doctor of Philosophy candidacy examination, June 2008. Topic: Using Semantic Web service wrappers to support end-user programming of bioinformatics workflows. Supervisory committee member.

Jason Heard, Doctor of Philosophy candidacy examination, May 2008. Topic: Co-evolution of agent communication protocols. Neutral chair.

Jia Zeng, Doctor of Philosophy candidacy examination, December 2007. Topic: Multi-agent based approach for translation initiation site prediction. Neutral chair.

Iidowu Adewale, Master of Science thesis defence, October 2007. Thesis: *Monitoring Jobs in Grid Computing Environments*. Neutral chair.

Moshood Omolade Saliu, Doctor of Philosophy thesis defence, September 2007. Thesis: *Software Release Planning for Evolving Systems*. Supervisory committee member.

Mark McIntyre, Master of Science thesis defence, September 2007. Thesis: *Supporting Repetitive Small-Scale Changes*. Supervisor.

Kobe Davis, Master of Science comprehensive examination, August 2007. Internal examiner.

Puneet Kapur, Bachelor of Science project defence, April 2007. Project: Metrics Maze: Determining code health through multivariate metrics analysis. Supervisor.

M. Rhett Dickson, Bachelor of Engineering project defence, April 2007. Project: An empirical evaluation of aspect-oriented design pattern evolvability. Supervisor.

Jeffrey Erman, Master of Science thesis defence, April 2007. Thesis: *Offline/Realtime Network Traffic Classification Using Semi-supervised Learning*. Neutral chair.

S. Jamal A. Siadat, Master of Science thesis defence, December 2006. Thesis: *An Evaluation of Simultaneous Evolvability and Efficiency in Aspect-Oriented Software Development*. Supervisor.

Reid Holmes, Doctor of Philosophy candidacy examination, December 2006. Topic: Unanticipated Large-Scale Software Reuse. Supervisor.

Ye Wang, Master of Science thesis defence, November 2006. Thesis: *Simulating Chinese Calligraphy and Painting in Real Time*. Neutral chair.

Dmitry Gavinsky, Doctor of Philosophy thesis defence, August 2006. Thesis: *Shared Randomness and Entanglement in Communication Complexity*. Neutral chair.

Shafquat Mahmud, Master of Science thesis defence, July 2006. Thesis: *When Should Crosscutting Concerns Be of Concern in the Software Development Life-cycle?* Supervisor.

Dhanashri Permanu, Master of Engineering (Department of Electrical and Computer Engineering) comprehensive examination, June 2006. "Internal" external examiner.

«Name withheld», examination, April 2006.

Jian (Jason) Huang, Master of Science (Department of Electrical and Computer Engineering) thesis defence, April 2006. Thesis: *Formal Methods for Software Pattern Specifications*. "Internal" external examiner.

Chenfeng Wang, Master of Science thesis defence, December 2005. Thesis: *Computational Geometry Methods in Fingerprint Identification*. Neutral chair.

Phong Nguyen (Willie) Tu, Master of Science comprehensive examination, De-

ember 2005. Internal examiner.

Xiaozhen (Jean) Cao, Doctor of Philosophy candidacy examination, December 2005. Topic: Quality of Service Issues in IEEE 802.11e Wireless Ad Hoc Networks. Internal examiner.

Moshood Omolade Saliu, Doctor of Philosophy candidacy examination, November 2005. Topic: Software Release Planning for Evolving Systems. Committee examiner.

Kevin Viggers, Master of Science thesis defence, September 2005. Thesis: *Improving the Modularity of Context-Sensitive Concerns through the Use of Declarative Event Patterns*. Supervisor.

Kristopher D. Read, Master of Science thesis defence, May 2005. Thesis: *Supporting Agile Teams of Teams via Test Driven Design*. Internal examiner.

Trevor R. Foraie, Master of Science comprehensive examination, January 2005. Internal examiner.

Edward Dantsiguer, Master of Engineering (Department of Electrical and Computer Engineering) comprehensive examination, January 2005. "Internal" external examiner.

Tracey D. Stock. Doctor of Philosophy (Resources and the Environment Program) entrance examination, September 2004. Topic: Application of Incomplete Contracting Theory to Development Challenges in Competing, Interconnected Subnetworks for Interorganizational Property Transfer Applications.

Craig Pastro, Master of Science thesis defence, March 2004. Thesis: *$\Sigma\Pi$ -Polycategories, Additive Linear Logic, and Process Semantics*. Internal examiner.

Sarah Paul, Bachelor of Science project defence, May 2003. Project: A canonical representation of intermodular dependencies for analysis of reuse and evolution. Supervisor.

Jim-Si Gee, Master of Science comprehensive examination, December 2002. Internal examiner.

Course instruction

University of Calgary

SENG 541 Modifiability of Large-Scale Software Systems (4th year undergraduate), Winter 2010.

SENG 301 Analysis and Design of Large-Scale Software I (2nd year undergraduate), Fall 2009.

SENG 641 Modifiability of Large-Scale Software Systems (graduate), Winter 2008. 4 students.

CPSC 301 Large-Scale Software Development (2nd year undergraduate), Winter 2008. 7 students.

CPSC 594 Software Engineering Project (4th year undergraduate), Fall 2007–Winter 2008. 11 students.

CPSC 599.61 Mining Software Repositories (4th year undergraduate), Summer 2007. 2 students.

CPSC 701.02 Advanced Topics in Development Tool Design and Evaluation (graduate), Winter 2007. 3 students + 2 auditors.

SENG 531 Software Evolution (4th year undergraduate), Winter 2007. 24 stu-

dents.

CPSC 601.33 Software Evolution (graduate), Winter 2006. 9 students.

SENG 531 Software Evolution (4th year undergraduate), Winter 2006. 8 students.

CPSC 601.33 Software Evolution (graduate), Winter 2005. 11 students + 1 auditor.

SENG 531 Software Evolution (4th year undergraduate), Winter 2005. 15 students.

SENG 311 Principles of Software Engineering (2nd year undergraduate), Fall 2004. 74 students.

SENG 609.36 Aspect-Oriented Software Development (graduate), Winter 2004. 14 students.

SENG 531 Software Evolution (4th year undergraduate), Winter 2004. 8 students.

CPSC 599.47 Software Evolution (4th year undergraduate), Winter 2003. 4 students + 2 auditors.

CPSC 595 Software Engineering Project II (4th year undergraduate), Winter 2003. 4 students.

CPSC 593 Software Engineering Project I (4th year undergraduate), Winter 2003. 11 students.

Guest Lecture, *Research in Software Evolution*, CPSC 699 Research Methodology (graduate), 3 September 2003.

CPSC 593 Software Engineering Project I (4th year undergraduate), Fall 2003. 3 students.

SENG 311 Principles of Software Engineering (2nd year undergraduate), Fall 2003. 62 students.

CPSC 593 Software Engineering Project I (4th year undergraduate), Fall 2002. 6 students.

University of British Columbia

CPSC 310 Introduction to Software Engineering (3rd year undergraduate), Summer 2000. 70 students. Sessional instructor.

Guest Lecture, *Design Patterns*, CPSC 310 Introduction to Software Engineering (3rd year undergraduate), 5 October 2001.

Teaching assistance

University of British Columbia

CPSC 319 Software Engineering Project, Term II, 2000/2001.

CPSC 319 Software Engineering Project, Term I, 2000/2001.

CPSC 414 Computer Graphics, Term II, 1996/1997.

CPSC 414 Computer Graphics, Term I, 1996/1997.

CPSC 414 Computer Graphics, Term II, 1995/1996.

CPSC 414 Computer Graphics, Term I, 1995/1996.

CPSC 126 Principles of Computer Science II, Summer 1995.

CPSC 124 Principles of Computer Science I, Summer 1995.
CPSC 304 File Systems, Term II, 1994/1995.
CPSC 414 Computer Graphics, Term I, 1994/1995.
CPSC 128 Principles of Computer Science, Term II, 1993/1994.
CPSC 128 Principles of Computer Science, Term I, 1993/1994.

SERVICE

University service

University of Calgary

Member, Research & Planning Committee, Department of Computer Science, University of Calgary. September 2007–June 2008.

Member, Curriculum/Undergraduate Affairs Committee, Department of Computer Science, University of Calgary. September 2003–June 2008.

Organizer, Industry–University Collaboration Day, Department of Computer Science, University of Calgary. September 2007–May 2008.

Director, Software Engineering Program, Department of Computer Science, University of Calgary. January 2004–September 2007.

Member, Hiring Committee, Department of Computer Science, University of Calgary. October 2004–June 2006.

Member, Academic Annual Review Committee, Department of Computer Science, University of Calgary. January 2006.

Member, Ad Hoc Committee on NSERC MSc Scholarship Applications, Department of Computer Science, University of Calgary, October 2004.

Leader, Re-accreditation, Department of Computer Science, University of Calgary, March–April 2004.

Member, Ad Hoc Committee on Entrance to the Malware Course, Department of Computer Science, University of Calgary, Fall 2003.

University of British Columbia

Graduate student representative, Space Committee, Department of Computer Science, University of British Columbia, 2000/2001–2001/2002.

Electronic thesis and publication archivist for the Imager Computer Graphics Laboratory, Department of Computer Science, University of British Columbia, 1996/1997–2001/2002.

Graduate student representative, Colloquium Committee, Department of Computer Science, University of British Columbia, 1995/1996.

Research community service

Journal refereeing

IEEE Transactions on Software Engineering, 2009.

IEEE Transactions on Software Engineering, 2008.

International Journal of Automated Software Engineering, 2008.

IEEE Transactions on Software Engineering, 2007/2008.
LNCS Transactions on Aspect-Oriented Software Development, 2007.
IEEE Software, 2007.
IEEE Software, 2006.
IEEE Design & Test of Computers, 2006.
IEEE Transactions on Software Engineering, 2005.
LNCS Transactions on Aspect-Oriented Software Development, 2005.
IEEE Software, 2005.
Journal of the Brazilian Computer Society, 2005.
Software—Practice & Experience, 2004.
LNCS Transactions on Aspect-Oriented Software Development, 2004.
IEEE Transactions on Software Engineering, 2002.
ACM Transactions on Software Engineering and Methodology, 2001.
Communications of the ACM, 2001.
Software—Practice & Experience, 2000.

Grant refereeing

Idea-to-Innovation Grant Application, Natural Sciences and Engineering Research Council, 2008.
Discovery Grant Program, Natural Sciences and Engineering Research Council, 2007.
Idea-to-Innovation Grant Application, Natural Sciences and Engineering Research Council, 2007.
Discovery Grant Program, Natural Sciences and Engineering Research Council, 2006.
Grant Program, Israel Science Foundation, 2004.
Invited panelist, *The Science of Design*, U.S. National Science Foundation, May 2004. [Declined due to previous commitments.]

Conference organization committees

Proceedings chair, ACM SIGSOFT International Symposium on the Foundations of Software Engineering (SIGSOFT 2008/FSE-16), 2008.
Student research forum co-chair (with M. Mezini), 3rd International Conference on Aspect-Oriented Software Development (AO SD), 2004.

Conference program committees

9th International Conference on Aspect-Oriented Software Development (AO SD), 2010.
25th IEEE International Conference on Software Maintenance (ICSM), 2009.
8th International Conference on Aspect-Oriented Software Development (AO SD), 2009.
24th IEEE International Conference on Software Maintenance (ICSM), 2008.
8th ACIS International Conference on Software Engineering, Artificial Intelligence,

Networking, and Parallel/Distributed Computing (SNPD), 2007.

5th International Conference on Aspect-Oriented Software Development (AOSD), 2006.

ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), 2005.

Conference external reviewing

ITI 3rd International Conference on Information & Communication Technology, 2005.

1st International Conference on Aspect-Oriented Software Development (AOSD), 2002.

Joint 7th European Software Engineering Conference and 7th ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/ FSE), 1999.

ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), 1999.

12th Annual ACM Symposium on User Interface Software and Technology (UIST), 1999.

ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), 1998.

Workshop and panel organization committees

Co-organizer/program co-chair (with M. Robillard and T. Zimmermann), Workshop on Recommendation Systems for Software Engineering, ACM SIGSOFT International Symposium on Foundations of Software Engineering (FSE), 2008.

Panel chair and organizer, *Empirical validation: What, why, when, and how*, International Conference on Software Engineering, 2003.

Workshop program committees

3rd Workshop on Assessment of Contemporary Modularization Techniques (ACoM), 2009.

2nd Workshop on Assessment of Contemporary Modularization Techniques (ACoM), 2008.

International Workshop on Aspect-Oriented Requirements Engineering and Architecture Design (Early Aspects), 2007.

1st Workshop on Assessment of Contemporary Modularization Techniques (ACoM), 2007.

International Workshop on Aspect-Oriented Requirements Engineering and Architecture Design (Early Aspects), 2006.

International Workshop on Aspect-Oriented Requirements Engineering and Architecture Design (Early Aspects), 2005.

1st Brazilian Workshop on Aspect-Oriented Software Development, 2004.

2nd International Workshop on Aspects, Components, and Patterns for Infrastructure Software, 2004.

Workshop on Advanced Separation of Concerns, ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications, 2001.

Student volunteer Webmaster, Graphics Interface Conference, 1998.
ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), 1997–1999.

Other external service Member, Software Engineering Committee, Canadian Association of Computer Science, August 2005–August 2008 (chair: T. Lethbridge).

Community outreach Volunteer consultant to Society for Treatment of Autism, early 2003. Advised the Society regarding their proposed re-development of their patient-care software.

PROFESSIONAL AFFILIATIONS

Association for Computing Machinery (ACM): Student Member, 1997–2003; Professional Member, 2003–present. ACM Special Interest Group on Software Engineering (ACM SIGSOFT), 1997–present. ACM Special Interest Group on Programming Languages (ACM SIGPLAN), 1997–2001.

Institute for Electrical and Electronics Engineers (IEEE): Student Member, 1997–2003; Member, 2003–2008. IEEE Computer Society, 1997–2008.

Society of Exploration Geophysicists (SEG): Student Member, 1991–1992.