Eric Walkingshaw

Assistant Professor
Oregon State University

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EDUCATION

Ph.D. Computer Science, Oregon State University, 2013
M.S. Computer Science, Oregon State University, 2011
B.S. Computer Science, minor in Applied Mathematics, University of Washington, 2006
B.A. English – Creative Writing, University of Washington, 2006
A.A., Edmonds Community College, 2002

EMPLOYMENT HISTORY

Assistant Professor, Oregon State University, Sep 2014 – present
Postdoctoral Researcher, University of Marburg, Aug 2013 – Aug 2014
Instructor, Oregon State University, Jan 2013 – Jun 2013
Graduate Research Assistant, Oregon State University, Sep 2007 – Jun 2013
Software Developer, Institute for Systems Biology, Oct 2006 – Jun 2007
Software Developer, Teranode Corporation, Jan 2005 – Jun 2006
Software Developer, Applied Physics Lab, University of Washington, May 2003 – Dec 2004

HONORS AND AWARDS

Best Paper Award, GPCE 2014
Achievement Rewards for College Scientists (ARCS) Scholar, 2009 – 2012
Best Paper Award, DSL 2009
University of Washington CSE Academic Scholarship, 2005
University of Washington CSE Award for Academic Excellence, 2004

RESEARCH GRANTS

Jul 2017 – Jun 2018 "Visual Languages and Human-Centric Computing (VL/HCC) 2017 Graduate Consortium", from NSF (IIS-1740926). **$30,000**.

Oct 2015 – Sep 2019 "IMMoRTALS: Interfaces, Models, and Monitoring for Resource-aware Transformations that Augment the Lifecycle of Systems", from DARPA BAA-15-36: *Building Resource Adaptive Software Systems (BRASS)*. Subcontract from Raytheon BBN Technologies. **OSU Lead-PI**. Co-PIs: Alex Groce and Arash Termehchy.
$870,282 (OSU total: $1.6M, award total: $7.7M)

Publications

Journal Articles

J6. John Peter Campora III, Sheng Chen, and Eric Walkingshaw. Casts and Costs: Harmonizing Safety and Performance in Gradual Typing. *Proc. of the ACM on Programming Languages (PACMPL) issue ACM SIGPLAN Int. Conf. on Functional Programming (ICFP)*, 2:98:1–98:30, 2018.

J5. John Peter Campora III, Sheng Chen, Martin Erwig, and Eric Walkingshaw. Migrating Gradual Types. *Proc. of the ACM on Programming Languages (PACMPL) issue ACM SIGPLAN Symp. on Principles of Programming Languages (POPL)*, 2:15:1–15:29, 2018.

J4. Sheng Chen, Martin Erwig, and Eric Walkingshaw. Extending Type Inference to Variational Programs. *ACM Trans. on Programming Languages and Systems (TOPLAS)*, 36(1):1:1–1:54, 2014.

J3. Martin Erwig and Eric Walkingshaw. A Visual Language for Explaining Probabilistic Reasoning. *Journal of Visual Languages and Computing (JVLC)*, 24(2):88–109, 2013.

J2. Martin Erwig and Eric Walkingshaw. The Choice Calculus: A Representation for Software Variation. *ACM Trans. on Software Engineering and Methodology (TOSEM)*, 21(1):6:1–6:27, 2011.

J1. Eric Walkingshaw and Martin Erwig. A Domain-Specific Language for Experimental Game Theory. *Journal of Functional Programming (JFP)*, 19:645–661, 2009.

Peer-Reviewed Book Chapters

B2. Martin Erwig and Eric Walkingshaw. Variation Programming with the Choice Calculus. In *Generative and Transformational Techniques in Software Engineering IV (GTTSE 2011), Revised and Extended Papers*, volume 7680 of *LNCS*, pages 55–99, 2013.

B1. Martin Erwig and Eric Walkingshaw. Semantics-Driven DSL Design. In Marjan Mernik, editor, *Formal and Practical Aspects of Domain-Specific Languages: Recent Developments*, pages 56–80. IGI Global, 2012.

Peer-Reviewed Conference and Workshop Papers

C27. Stephan Adelsberger, Anton Setzer, and Eric Walkingshaw. Declarative GUIs: Simple, Consistent, and Verified. In *ACM SIGPLAN Int. Symp. on Principles and Practice of Declarative Programming (PPDP)*, pages 4:1–4:15, 2018.

C26. Stephan Adelsberger, Anton Setzer, and Eric Walkingshaw. Developing GUI Applications in a Verified Setting. In *Symp. on Dependable Software Engineering: Theories, Tools and Applications (SETTA)*, 2018. To appear.

C25. Parisa Ataei, Arash Termehchy, and Eric Walkingshaw. Managing Structurally Heterogeneous Databases in Software Product Lines. In *VLDB Workshop: Polystores and Other Systems for Heterogeneous Data (Poly)*, 2018. To appear.

C24. Jeffrey Young and Eric Walkingshaw. A Domain Analysis of Data Structure and Algorithm Explanations in the Wild. In *ACM SIGCSE Technical Symp. on Computer Science Education (SIGCSE)*, pages 870–875, 2018.

C23. Parisa Ataei, Arash Termehchy, and Eric Walkingshaw. Variational Databases. In *Int. Symp. on Database Programming Languages (DBPL)*, pages 11:1–11:4. ACM, 2017.

C22. Rahul Gopinath and Eric Walkingshaw. How Good are Your Types? Using Mutation Analysis to Evaluate the Effectiveness of Type Annotations. In *Int. Work. on Mutation Analysis (Mutation)*, pages 122–127. IEEE, 2017. **Best presentation**.

C21. Meng Meng, Jens Meinicke, Chu-Pan Wong, Eric Walkingshaw, and Christian Kästner. A Choice of Variational Stacks: Exploring Variational Data Structures. In *Int. Work. on Variability Modelling of Software-Intensive Systems (VaMoS)*, pages 28–35. ACM, 2017.

C20. Spencer Hubbard and Eric Walkingshaw. Formula Choice Calculus. In *Int. Work. on Feature-Oriented Software Development (FOSD)*, pages 49–57. ACM, 2016.

C19. Ştefan Stănciulescu, Thorsten Berger, Eric Walkingshaw, and Andrzej Wąsowski. Concepts, Operations, and Feasibility of a Projection-Based Variation Control System. In *IEEE Int. Conf. on Software Maintenance and Evolution (ICSME)*, pages 323–333, 2016.

C18. Sheng Chen, Martin Erwig, and Eric Walkingshaw. A Calculus for Variational Programming. In *European Conf. on Object-Oriented Programming (ECOOP)*, volume 56 of *LIPIcs*, pages 6:1–6:26, 2016.

C17. Keeley Abbott, Christopher Bogart, and Eric Walkingshaw. Programs for People: What We Can Learn from Lab Protocols. In *IEEE Int. Symp. on Visual Languages and Human-Centric Computing (VL/HCC)*, pages 203–211, 2015.

C16. Eric Walkingshaw, Christian Kästner, Martin Erwig, Sven Apel, and Eric Bodden. Variational Data Structures: Exploring Trade-Offs in Computing with Variability. In *ACM SIGPLAN Symp. on New Ideas in Programming and Reflections on Software (Onward!)*, pages 213–226, 2014.

C15. Eric Walkingshaw and Klaus Ostermann. Projectional Editing of Variational Software. In *ACM SIGPLAN Int. Conf. on Generative Programming: Concepts and Experiences (GPCE)*, pages 29–38, 2014. **Best paper**.

C14. Martin Erwig, Eric Walkingshaw, and Sheng Chen. An Abstract Representation of Variational Graphs. In *Int. Work. on Feature-Oriented Software Development (FOSD)*, pages 25–32. ACM, 2013.

C13. Martin Erwig, Klaus Ostermann, Tillmann Rendel, and Eric Walkingshaw. Adding Configuration to the Choice Calculus. In *Int. Work. on Variability Modelling of Software-Intensive Systems (VaMoS)*, pages 13:1–13:8. ACM, 2013.

C12. Eric Walkingshaw and Martin Erwig. A Calculus for Modeling and Implementing Variation. In *ACM SIGPLAN Int. Conf. on Generative Programming and Component Engineering (GPCE)*, pages 132–140, 2012.

C11. Sheng Chen, Martin Erwig, and Eric Walkingshaw. An Error-Tolerant Type System for Variational Lambda Calculus. In *ACM SIGPLAN Int. Conf. on Functional Programming (ICFP)*, pages 29–40, 2012.

C10. Martin Erwig and Eric Walkingshaw. Semantics First! Rethinking the Language Design Process. In *ACM SIGPLAN Int. Conf. on Software Language Engineering (SLE)*, volume 6940 of *LNCS*, pages 243–262, 2011.

C9. Duc Le, Eric Walkingshaw, and Martin Erwig. #ifdef Confirmed Harmful: Promoting Understandable Software Variation. In *IEEE Int. Symp. on Visual Languages and Human-Centric Computing (VL/HCC)*, pages 143–150, 2011.

C8. Eric Walkingshaw and Martin Erwig. A DSEL for Studying and Explaining Causation. In *IFIP Working Conf. on Domain-Specific Languages (DSL)*, pages 143–167, 2011.

C7. Martin Erwig and Eric Walkingshaw. Program Fields for Continuous Software. In *ACM SIGSOFT Workshop on the Future of Software Engineering Research*, pages 105–108, 2010.

C6. Martin Erwig and Eric Walkingshaw. Causal Reasoning with Neuron Diagrams. In *IEEE Int. Symp. on Visual Languages and Human-Centric Computing (VL/HCC)*, pages 101–108, 2010.

C5. Martin Erwig and Eric Walkingshaw. Visual Explanations of Probabilistic Reasoning. In *IEEE Int. Symp. on Visual Languages and Human-Centric Computing (VL/HCC)*, pages 23–27, 2009.

C4. Martin Erwig and Eric Walkingshaw. A DSL for Explaining Probabilistic Reasoning. In *IFIP Working Conf. on Domain-Specific Languages (DSL)*, volume 5658 of *LNCS*, pages 335–359, 2009. **Best paper**.

C3. Eric Walkingshaw and Martin Erwig. Varying Domain Representations in Hagl – Extending the Expressiveness of a DSL for Experimental Game Theory. In *IFIP Working Conf. on Domain-Specific Languages (DSL)*, volume 5658 of *LNCS*, pages 310–334, 2009.

C2. Eric Walkingshaw, Paul Strauss, Martin Erwig, Jonathan Mueller, and Irem Tumer. A Formal Representation of Software-Hardware System Design. In *ASME Int. Design Engineering Technical Conf. & Computers and Information in Engineering Conf. (IDETC/CIE)*, pages 1387–1398, 2009.

C1. Martin Erwig and Eric Walkingshaw. A Visual Language for Representing and Explaining Strategies in Game Theory. In *IEEE Int. Symp. on Visual Languages and Human-Centric Computing (VL/HCC)*, pages 101–108, 2008.

Doctoral Consortia

D2. Eric Walkingshaw. Managing Variation in Explanation-Oriented Languages. In *Doctoral Consortium at IEEE Int. Symp. on Visual Languages and Human-Centric Computing (VL/HCC)*, pages 247–248, 2010.

D1. Eric Walkingshaw. Designing Explanation-Oriented Languages. In *Doctoral Consortium at IEEE Int. Symp. on Visual Languages and Human-Centric Computing (VL/HCC)*, pages 274–275, 2008.

Theses and Other Papers

T3. Eric Walkingshaw. *The Choice Calculus: A Formal Language of Variation*. PhD thesis, Oregon State University, 2013. `http://hdl.handle.net/1957/40652`.

T2. Eric Walkingshaw. Domain-Specific Language Support for Experimental Game Theory. Master's thesis, Oregon State University, 2011. `http://hdl.handle.net/1957/26757`.

T1. Eric Walkingshaw. Features and Feature Models: A Survey of Variation Representations. In *Compendium of Computer Science Doctoral Qualifying Exams*. Oregon State University, 2010. `http://hdl.handle.net/1957/19243`.

PROFESSIONAL SERVICE

Conference and Workshop Organization

Organizer and Program Co-Chair, FOSD 2017
Program Co-Chair, DSLDI 2017
Graduate Consortium Chair, VL/HCC 2017
Web and Publicity Co-Chair, SPLASH 2017
Organizer and Program Co-Chair, DSLDI 2016
Showpieces Co-Chair, VL/HCC 2015

Program Committee

SLE (2018), PNW-PLSE (2018), GPCE (2017), SLE (2017), VL/HCC (2017), ICSME-NIER (2017), SLE (2016), VL/HCC (2016), PEPM (2016), HuFaMo (2016), VL/HCC (2015), VaMoS (2015)

External Reviewer

JFP (2018), SoSyM (2018), JVLC (2016), GPCE (2016, 2014, 2013), VLDB (2015), JLAMP (2014), FOSD (2014, 2012), VaMoS (2013, 2012, 2011), PPDP (2012), PEPM (2012), VL/HCC (2011, 2010), IFL (2011, 2009, 2008), PADL (2011), DSL (2009), IDETC (2009), book chapter for *Formal and Practical Aspects of Domain-Specific Languages: Recent Developments* (2012)

Other Service

NSF Proposal Review Panel, 2017
NSF Proposal Review Panel, 2016
Graduate Consortium Panel, VL/HCC 2015
Student Volunteer, VL/HCC 2009

Teaching and Advising

Curriculum Development

Developed a new special topics course on modularity in programming languages.
Led restructure and expansion of graduate-level programming languages sequence.
Developed two new discussion seminars at University of Marburg.

Courses Taught, Oregon State University

CS 261 – Data Structures
CS 271 – Computer Architecture and Assembly Language
CS 381 – Programming Language Fundamentals
CS 581 – Programming Languages I
CS 581 – Programming Languages (before expansion to two course sequence)
CS 583 – Advanced Functional Programming
CS 589 – Special Topics in Programming Languages: Modularity

Courses Taught, University of Marburg

Discussion Seminar: Human Factors in Programming Languages
Discussion Seminar: Modular Extensibility

Students Graduated

Michael McGirr, M.S. 2018
Project: "The Ownership Monad"

Keeley Abbott, M.S. 2017
Thesis: "Formative Work Toward a Mixed-Initiative Programming Language"

Meng Meng, M.S. 2017
Thesis: "Implementation Techniques for Variational Data Structures"

Miles Van de Wetering, Honors B.S. 2017
Thesis: "View-Based Editing of Variational Code"

Shujin Wu, M.S. 2017
Project: "A Template CoprHD Storage Driver Based on the Southbound SDK"

Spencer Hubbard, M.S. 2016
Thesis: "A Formal Foundation for Variational Programming Using the Choice Calculus"

Current Students

Ghadeer Al Kubaish, M.S. student
Parisa Ataei, Ph.D. candidate
Sebastian Benjamin, undergraduate research
Alexander Grasley, M.S. student
Qiaoran Li, M.S. student
Spencer Mitchell, RELU student
Nasrin Sanati, M.S. student

Jeffrey Young, Ph.D. student

Graduate Committee Member

Karl Smeltzer, Ph.D. 2018
Xiaofei Guo, M.S. 2018
Sruti Srinivasa Ragavan, M.S. 2018
Deepthi Kumar, M.S. 2017
Parisa Ataei, M.S. 2017
Islam Almusaly, Ph.D. 2017
Rahul Gopinath, Ph.D. 2017
Cole Crawford, M.A. English 2017 (GCR)
Xiangyu Wang, M.S. 2017
Prathamesh Patkar, M.S. 2016
Sheng Chen, Ph.D. 2014
Keying Xu, M.S. 2014
20+ M.Eng. exams, 2015–2018

Master's Student Work Project Advisor, University of Marburg

Jonathan Brachthäuser, 2013–2014
Christoph Weygand, 2013–2014

Co-Mentor, Apprenticeships in Science and Engineering

David Wen, Summer 2012
Miles Van de Wetering, Summer 2011
Ben McMorran, Summer 2010

UNIVERSITY SERVICE

Activist Council and Organizing Committee, United Academics of OSU, 2016–present
Computer Science Hiring Committee, 2017–present
Computer Science Undergraduate Curriculum Committee, 2014–2015, 2016–2017, 2018–present
Computer Science Graduate Curriculum Committee, 2015–2016