Scott D. Fleming

Associate Chair and Associate Professor

Department of Computer Science
University of Memphis
375 Dunn Hall, Memphis, TN 38152
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Research Interests

Broadly: Computing Education, Software Engineering, and Human–Computer Interaction

Specifically: Learning Strategies and Theories for Acquisition of Coding Skills, SE Tools, Empirical SE, Information Foraging Theory for SE, End-User Programming, Gender Issues in Computing, and Program Comprehension

Education

2009 **Ph.D. in Computer Science, Michigan State University**
Department of Computer Science and Engineering — East Lansing, Michigan
Thesis: Successful Strategies for Debugging Concurrent Software: An Empirical Investigation
Advisor: Dr. R. E. Kurt Stirewalt

2001 **M.S. in Computer Science, Western Michigan University**
Department of Computer Science — Kalamazoo, Michigan

1999 **B.A. in Fine Art, Western Michigan University**
Department of Computer Science — Kalamazoo, Michigan

Professional Experience

2021–present **Associate Chair, University of Memphis**
Department of Computer Science — Memphis, Tennessee

2017–present **Associate Professor, University of Memphis**
Department of Computer Science — Memphis, Tennessee

2011–2017 **Assistant Professor, University of Memphis**
Department of Computer Science — Memphis, Tennessee

2009–2011 **Research Associate (Post-Doc), Oregon State University**
School of Electrical Engineering and Computer Science — Corvallis, Oregon

2004–2009 **Graduate Assistant, Michigan State University**
Department of Computer Science and Engineering — East Lansing, Michigan

2001–2003 **Instructor, Western Michigan University**
Department of Computer Science — Kalamazoo, Michigan

1999–2001 **Graduate Assistant, Western Michigan University**
Department of Computer Science — Kalamazoo, Michigan

Honors & Awards

2022 **Most Influential Paper Award, IEEE VL/HCC**
IEEE Symposium on Visual Languages and Human-Centric Computing.
Paper: "Modeling Programmer Navigation: A head-to-head empirical evaluation of predictive models" from VL/HCC 2011.

2021 **Dean's Award for Teaching Excellence**, College of Arts and Sciences, University of Memphis

2018 **College of Arts and Sciences Distinguished Research Award (CASDRA)**, College of Arts and Sciences, University of Memphis

2017 **Nominee/Finalist, Distinguished Teaching Award**, University of Memphis
One of the top 19 faculty at the University to receive the most nominations from students, alumni, and faculty colleagues.

2016 **ACM SIGSOFT Distinguished Paper Award, ACM FSE**
ACM SIGSOFT Int'l Symposium on the Foundations of Software Engineering.
Paper: "Foraging and Navigations, Fundamentally: Developers' Predictions of Value and Cost."

2016 **Best Paper Award, IEEE VL/HCC**
IEEE Symposium on Visual Languages and Human-Centric Computing.
Paper: "Yestercode: Improving Code-Change Support in Visual Dataflow Programming Environments."

2015 **Early Career Research Award**, College of Arts and Sciences, University of Memphis

2015 **Nominee/Finalist, Distinguished Teaching Award**, University of Memphis
One of the top 22 faculty at the University to receive the most nominations from students and alumni.

2014 **Nominee/Finalist, Distinguished Teaching Award**, University of Memphis
One of the top 20 faculty at the University to receive the most nominations from students and alumni.

2011 **Best Paper Award, IEEE VL/HCC**
IEEE Symposium on Visual Languages and Human-Centric Computing.
Paper: "An Exploration of Design Opportunities for 'Gardening' End-User Programmers' Ideas."

2008 **Honda Shing Endowed Fellowship in Computer Science**
Department of Computer Science and Engineering, Michigan State University.

2001 **Honorable Mention, Outstanding Graduate Student Award**
Department of Computer Science, Western Michigan University.

2001 **Honorable Mention, Departmental Teaching Effectiveness Award**
Department of Computer Science, Western Michigan University.

External Support

2020–2024 **National Science Foundation**, Advancing the Science of Learning Data Science with Adaptive Learning for Future Workforce Development

- **Award: $3,439,035** 01/15/2020–12/31/2024
- Andrew Olney (PI), Vasile Rus (Co-PI), Scott Fleming (Co-PI), Dale Bowman (Co-PI), Andrew Tawfik (Co-PI)
- Objectives: Advance understanding of how data science is learned and how to optimize that learning by identifying the most effective scaffolds for worked examples across varying levels of expertise and by comparing a data science intelligent tutoring condition that implements these findings against worked example and pure problem-solving controls. Longitudinal studies will be conducted in partnership with the data science division of St. Jude Children's Research Hospital and through a summer internship for STEM majors from LeMoyne-Owen College in order to provide additional evidence regarding workforce relevance through usability metrics and progress in personal learning plans.

2018–2022 **National Science Foundation**, Collaborative Research: CSEdPad: Investigating and Scaffolding Students' Mental Models during Computer Programming Tasks to Improve Learning, Engagement, and Retention

- **Award: $749,655** (My Portion: $499,136) 09/01/2018–08/31/2022
- Collaborative Grant:
  - University of Memphis (Lead Organization): Vasile Rus (PI), Scott Fleming (Co-PI).
  - University of Pittsburgh: Peter Brusilovsky (PI).
- Objectives: Investigate a novel education technology, *CSEdPad* (CS Education Pad), that aims to ease students' introduction to programming during their early encounters with CS concepts and tasks. In particular, the system monitors and scaffolds students' comprehension of programs during educational programming tasks. Key approaches explored include software visualization, Animated Pedagogical Agents, self-explanation, and the Open Social Learner Model.

2018 **National Science Foundation**, WORKSHOP: Visual Languages and Human-Centric Computing (VL/HCC) 2018 Graduate Consortium

- **Award: $28,814** 07/01/2018–06/30/2019
- PI: Scott Fleming
- Objectives: Support the Graduate Consortium of the 2018 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC '18), including travel funding for faculty panelists and student participants.

2013–2018 **National Science Foundation**, SHF: Medium: Collaborative Research: Information Foraging Theory: From Scientific Principles to Engineering Practice

- **Award: $894,644** (My Portion: $311,662) 09/01/2013–08/31/2018
- Collaborative Grant:
  - University of Memphis: Scott Fleming (PI, Lead Organization).
  - Oregon State University: Chris Scaffidi (PI), Margaret Burnett (Co-PI).
- Objectives: (1) Expand Information Foraging Theory to describe how learning affects developers' navigation through code and related artifacts, (2) generate theory-grounded design patterns explaining how to design tools that aid developers' information foraging, (3) develop a design method enabling tool builders to apply these patterns, and (4) evaluate the validity and effectiveness of 1–3.
- **REU Supplement: $16,200** 03/26/2015

2015–2016 **National Instruments Corporation**, Improving Refactoring in Visual Dataflow Languages through User-Centered Design

- **Award: $31,769** 09/01/2015–08/31/2016
- PI: Scott Fleming
- Objectives: (1) Provide an empirically based characterization of how developers currently refactor code in LabVIEW, including barriers they face, (2) leveraging this empirical evidence, propose principles for the design of effective refactoring tools, and (3) design and implement new tool designs that follow the principles.

2015 **ABB Corporation**, Improving the Efficiency of Code Navigation through New Interfaces and Tool Concepts

- **Award: $7,668** 05/15/2015–08/31/2015
- PI: Scott Fleming
- Objectives: Design and implement an extension to Microsoft Visual Studio that provides an interactive code visualization to help developers navigate code more efficiently.

2014–2015 **National Instruments Corporation**, Research Support

- **Award: $11,684** 09/01/2014–08/31/2015
- PI: Scott Fleming
- Objectives: Conduct empirical research to enhance understanding of the barriers that LabVIEW programmers en- counter in navigating and editing visual dataflow code.

2013 **National Science Foundation**, WORKSHOP: VL/HCC 2013 Graduate Consortium

- **Award: $24,243** 01/15/2013–12/31/2013
- PI: Scott Fleming
- Objectives: Support the Graduate Consortium of the 2013 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC '13), including travel funding for faculty panelists and student participants.

Journal Publications

Underline denotes PhD-holding authors (e.g., faculty, post-docs); others are generally students.

[J5] **IwC '15:** Jill Cao, **Scott D. Fleming**, Margaret Burnett, and Christopher Scaffidi. "Idea Garden: Situated Support for Problem Solving by End-User Programmers." *Interacting with Computers*, 27(6):640–660, Nov. 2015. DOI: 10.1093/iwc/iwu022. [Impact Factor (2012): 1.16]

[J4] **ACM TOSEM '13:** **Scott D. Fleming**, Christopher Scaffidi, David Piorkowski, Margaret Burnett, Rachel K. E. Bellamy, Joseph Lawrance, and Irwin Kwan. "An Information Foraging Theory Perspective on Tools for Debugging, Refactoring, and Reuse Tasks." *ACM Transactions on Software Engineering and Methodology*, 22(2):14:1–14:41, Mar. 2013. DOI: 10.1145/2430545.2430551. [Impact Factor (2012): 1.55]

[J3] **IEEE TSE '13:** Joseph Lawrance, Christopher Bogart, Margaret Burnett, Rachel Bellamy, Kyle Rector, and **Scott D. Fleming**. "How Programmers Debug, Revisited: An Information Foraging Theory Perspective." *IEEE Transactions on Software Engineering*, 39(2):197–215, Feb. 2013. DOI: 10.1109/TSE.2010.111. [Impact Factor (2012): 2.59]

[J2] **IwC '11:** Margaret M. Burnett, Laura Beckwith, Susan Wiedenbeck, **Scott D. Fleming**, Jill Cao, Thomas H. Park, Valentina Grigoreanu, and Kyle Rector. "Gender Pluralism in Problem-Solving Software." *Interacting with Computers*, 23(5):450–460, 2011. DOI: 10.1016/j.intcom.2011.06.004. [Impact Factor (2012): 1.16]

[J1] **IVS '09:** Shaohua Xie, Eileen Kraemer, R. E. K. Stirewalt, Laura K. Dillon, and **Scott D. Fleming**. "Design and Evaluation of Extensions to UML Sequence Diagrams for Modeling Multithreaded Interactions." *Information Visualization*, 8(2):120–136, 2009. DOI: 10.1057/ivs.2009.6. [Impact Factor (2010): 1.34]

Refereed Conference Publications

Underline denotes PhD-holding authors (e.g., faculty, post-docs); others are generally students.

[C24] **ITS '22:** Vasile Rus, Peter Brusilovsky, Lasang Jimba Tamang, Kamil Akhuseyinoglu, and **Scott D. Fleming**. "DeepCode: An Annotated Set of Instructional Code Examples to Foster Deep Code Comprehension and Learning." In *Proc. Int'l Conf. Intelligent Tutoring Systems*, 2022, 15 pages. DOI: 10.1007/978-3-031-09680-8_4. [28% acceptance rate]

[C23] **ACM SIGCSE '22:** Kathryn Bridson, Jeffrey Atkinson, and **Scott D. Fleming**. "Delivering Round-the-Clock Help to Software Engineering Students Using Discord: An Experience Report." In *Proc. ACM Technical Symposium on Computer Science Education*, 2022, 7 pages. DOI: 10.1145/3478431.3499385. [29% acceptance rate]

[C22] **ACM SIGCSE '21:** Kathryn Bridson and **Scott D. Fleming**. "Frequent, Timed Coding Tests for Training and Assessment of Full-Stack Web Development Skills: An Experience Report." In *Proc. ACM Technical Symposium on Computer Science Education*, 2021, 7 pages. DOI: 10.1145/3408877.3432549. [31% acceptance rate]

[C21] **IEEE VL/HCC '18:** Austin Z. Henley and **Scott D. Fleming**. "CodeDeviant: Helping Programmers Detect Edits That Accidentally Alter Program Behavior." In *Proc. IEEE Symp. Visual Languages and Human-Centric Computing*, 2018, 9 pages. DOI: 10.1109/VLHCC.2018.8506567. [29% acceptance rate]

[C20] **ACM CHI '18:** Austin Z. Henley, Kivanç Muçlu, Maria Christakis, **Scott D. Fleming**, and Bird, Christian. "CFar: A Tool to Increase Communication, Productivity, and Review Quality in Collaborative Code Reviews." In *Proc. ACM SIGCHI Conference on Human Factors in Computing Systems*, 2018, 13 pages. DOI: 10.1145/3173574.3173731. [26% acceptance rate]

[C19] **ACM CHI '17:** Austin Z. Henley, **Scott D. Fleming**, and Maria V. Luong. "Toward Principles for the Design of Navigation Affordances in Code Editors: An Empirical Investigation." In *Proc. ACM SIGCHI Conference on Human Factors in Computing Systems*, 2017, 13 pages. DOI: 10.1145/3025453.3025645. [25% acceptance rate]

[C18] **ACM FSE '16:** David Piorkowski, Austin Z. Henley, Tahmid Nabi, **Scott D. Fleming**, Christopher Scaffidi, and Margaret Burnett. "Foraging and Navigations, Fundamentally: Developers' Predictions of Value and Cost." In *Proc. ACM SIGSOFT Int'l Symposium on the Foundations of Software Engineering*, 2016, 12 pages. DOI: 10.1145/2950290.2950302. [27% acceptance rate] **★ ACM SIGSOFT Distinguished Paper Award ★**

[C17] **IEEE ICSME '16:** Alka Singh, Austin Z. Henley, **Scott D. Fleming**, and Maria V. Luong "An Empirical Evaluation of Models of Programmer Navigation." In *Proc. IEEE International Conference on Software Maintenance and Evolution*, 2016, 11 pages. DOI: 10.1109/ICSME.2016.84. [29% acceptance rate]

[C16] **IEEE VL/HCC '16:** Austin Z. Henley and **Scott D. Fleming**. "Yestercode: Improving Code-Change Support in Visual Dataflow Programming Environments." In *Proc. IEEE Symp. Visual Languages and Human-Centric Computing*, 2016, 9 pages. DOI: 10.1109/VLHCC.2016.7739672. [33% acceptance rate] **★ Best Paper Award ★**

[C15] **IEEE ICSME '15:** David Piorkowski, **Scott D. Fleming**, Christopher Scaffidi, Margaret Burnett, Irwin Kwan, Austin Z. Henley, Jamie Macbeth, Charles Hill, and Amber Horvath. "To Fix or to Learn? How Production Bias Affects Developers' Information Foraging during Debugging." In *Proc. IEEE International Conference on Software Maintenance and Evolution*, 2015, 10 pages. DOI: 10.1109/ICSM.2015.7332447. [22% acceptance rate]

[C14] **ACM CHI '14:** Austin Z. Henley and **Scott D. Fleming**. "The Patchworks Code Editor: Toward Faster Navigation with Less Code Arranging and Fewer Navigation Mistakes." In *Proc. ACM SIGCHI Conference on Human Factors in Computing Systems*, 2014, 10 pages. DOI: 10.1145/2556288.2557073. [23% acceptance rate]

[C13] **IEEE VL/HCC '13:** Danielle L. Jones and **Scott D. Fleming**. "What Use Is a Backseat Driver? A Qualitative Investigation of Pair Programming." In *Proc. IEEE Symp. Visual Languages and Human-Centric Computing*, 2013, 8 pages. DOI: 10.1109/VLHCC.2013.6645252. [30% acceptance rate]

[C12] **IEEE VL/HCC '13:** Jill Cao, Irwin Kwan, Faezeh Bahmani, Margaret Burnett, **Scott D. Fleming**, Josh Jordahl, Amber Horvath, Sherry Yang. "End-User Programmers in Trouble: Can the Idea Garden help them to help themselves?" In *Proc. IEEE Symp. Visual Languages and Human-Centric Computing*, 2013, 8 pages. DOI: 10.1109/VLHCC.2013.6645260 [30% acceptance rate]

[C11] **ACM CHI '13:** David Piorkowski, **Scott D. Fleming**, Irwin Kwan, Margaret Burnett, Chris Scaffidi, Rachel K.E. Bellamy, and Joshua Jordhal. "The Whats and Hows of Programmers' Foraging Diets." In *Proc. 2013 ACM Annual Conf. Human Factors in Computing Systems*, 2013, 10 pages. DOI: 10.1145/2466416.2466418. [20% acceptance rate]

[C10] **IEEE VL/HCC '12:** Jill Cao, Irwin Kwan, Rachel White, **Scott D. Fleming**, Margaret Burnett, and Christopher Scaffidi. "From Barriers to Learning in the Idea Garden: An Empirical Study." In *Proc. IEEE Symp. Visual Languages and Human-Centric Computing*, 2012, 8 pages. DOI: 10.1109/VLHCC.2012.6344483. [28% acceptance rate]

[C9] **ACM CHI '12:** David Piorkowski, **Scott D. Fleming**, Christopher Scaffidi, Christopher Bogart, Margaret Burnett, Bonnie E. John, Rachel K. E. Bellamy, and Calvin Swart. "Reactive Information Foraging: An Empirical Investigation of Theory-Based Recommender Systems for Programmers." In *Proc. 2012 ACM Annual Conf. Human Factors in Computing Systems*, 2012, 10 pages. DOI: 10.1145/2207676.2208608. [23% acceptance rate]

[C8] **IEEE VL/HCC '11:** Jill Cao, **Scott D. Fleming**, and Margaret Burnett. "An Exploration of Design Opportunities for 'Gardening' End-User Programmers' Ideas." In *Proc. IEEE Symp. Visual Languages and Human-Centric Computing*, 2011, 8 pages. DOI: 10.1109/VLHCC.2011.6070375. [33% acceptance rate] ★ **Best Paper Award** ★

[C7] **IEEE VL/HCC '11:** David Piorkowski, **Scott D. Fleming**, Christopher Scaffidi, Liza John, Christopher Bogart, Bonnie E. John, Margaret Burnett, and Rachel Bellamy. "Modeling Programmer Navigation: A head-to-head empirical evaluation of predictive models." In *Proc. IEEE Symp. Visual Languages and Human-Centric Computing*, 2011, 8 pages. DOI: 10.1109/VLHCC.2011.6070387. [33% acceptance rate] ★ **Most Influential Paper Award (2022)** ★

[C6] **IEEE VL/HCC '10:** **Scott D. Fleming**, Eileen Kraemer, R. E. K. Stirewalt, and Laura K. Dillon. "Debugging Concurrent Software: The Importance of External Representations." In *Proc. IEEE Symp. Visual Languages and Human-Centric Computing*, 2010, 8 pages. DOI: 10.1109/VLHCC.2010.14. [30% acceptance rate]

[C5] **IEEE VL/HCC '10:** Jill Cao, Kyle Rector, Thomas H. Park, **Scott D. Fleming**, Margaret Burnett, and Susan Wiedenbeck. "A Debugging Perspective on End-User Mashup Programming." In *Proc. IEEE Symp. Visual Languages and Human-Centric Computing*, 2010, 8 pages. DOI: 10.1109/VLHCC.2010.29. [30% acceptance rate]

[C4] **ESEM '10:** Margaret Burnett, **Scott Fleming**, Shamsi Iqbal, Gina Venolia, Vidya Rajaram, Umer Farooq, Valentina Grigoreanu, and Mary Czerwinski. "Gender Differences and Programming Environments: Across Programming Populations." In *Proc. 4th Int'l Symp. Empirical Software Engineering and Measurement*, 2010, 10 pages. DOI: 10.1145/1852786.1852824. [29% acceptance rate]

[C3] **ACM SoftVis '08:** Shaohua Xie, Eileen Kraemer, R. E. K. Stirewalt, Laura K. Dillon, and **Scott D. Fleming**. "Assessing the Benefits of Synchronization-Adorned Sequence Diagrams: Two Controlled Experiments." In *Proc. 2008 ACM Symp. Software Visualization*, 2008, 10 pages. DOI: 10.1145/1409720.1409723. [42% acceptance rate]

[C2] **IEEE ICPC '08:** **Scott D. Fleming**, Eileen Kraemer, R. E. K. Stirewalt, Laura K. Dillon, and Shaohua Xie. "Refining Existing Theories of Program Comprehension During Maintenance for Concurrent Software." In *Proc. 16th IEEE Int'l Conf. Program Comprehension*, 2008, 10 pages. DOI: 10.1109/ICPC.2008.40. [35% acceptance rate]

[C1] **ACM/IEEE ICSE-SEE '08:** **Scott D. Fleming**, Eileen T. Kraemer, R. E. K. Stirewalt, Shaohua Xie, and Laura K. Dillon. "A Study of Student Strategies for the Corrective Maintenance of Concurrent Software." In *Proc. 30th ACM/IEEE Int'l Conf. Software Engineering*, Software Engineering Education Track, 2008, 10 pages. DOI: 10.1145/1368088.1368195. [24% acceptance rate]

Refereed Short Papers & Workshop Publications

Underline denotes PhD-holding authors (e.g., faculty, post-docs); others are generally students.

[S12] **CSEDM '21:** Andrew Olney and **Scott D. Fleming**. "JupyterLab Extensions for Blocks Programming, Self-Explanations, and HTML Injection." In *Proc. Educational Data Mining in Computer Science Education Workshop*, 2021, 6 pages.

[S11] **ACM SIGCSE '21 Demos:** Andrew Olney, **Scott D. Fleming**, and Jillian Johnson. "Learning Data Science with Blockly in JupyterLab." In *Proc. ACM Technical Symposium on Computer Science Education* Demos Track, 2021, 1 page. DOI: 10.1145/3408877.3439534.

[S10] **AIED '19 Interactive Presentations:** Vasile Rus, Peter Brusilovsky, **Scott D. Fleming**, Lasang Tamang, Kamil Akhuseyinoglu, Jordan Barria-Pineda, Nisrine Ait-Khayi, and Zeyad Alshaikh. "An Intelligent Tutoring System for Source Code Comprehension." In *Proc. 20th Int'l Conf. Artificial Intelligence in Education* Interactive Presentations Track, 2021, 2 pages.

[S9] **IEEE B&B '19:** Andrew Olney and **Scott D. Fleming**. "A Cognitive Load Perspective on the Design of Blocks Languages for Data Science." In *Proc. IEEE Blocks and Beyond Workshop*, 2019, 3 pages. DOI: 10.1109/BB48857.2019.8941224.

[S8] **IEEE VL/HCC '16:** Tahmid Nabi, Kyle M.D. Sweeney, Sam Lichlyter, David Piorkowski, Christopher Scaffidi, Margaret Burnett, and **Scott D. Fleming**. "Putting Information Foraging Theory to Work: Community-based Design Patterns for Programming Tools." In *Proc. IEEE Symposium on Visual Languages and Human-Centric Computing*, 2016, 5 pages. DOI: 10.1109/VLHCC.2016.7739675.

[S7] **IEEE VL/HCC '14:** Austin Z. Henley, Alka Singh, **Scott D. Fleming**, and Maria V. Luong. "Helping Programmers Navigate Code Faster with Patchworks: A Simulation Study." In *Proc. IEEE Symp. Visual Languages and Human-Centric Computing*, 2014, 4 pages. DOI: 10.1109/VLHCC.2014.6883026.

[S6] **FutureCSD '12:** Irwin Kwan, **Scott D. Fleming**, and David Piorkowski. "Information Foraging Theory for Collaborative Software Development." In *Proc. CSCW 2012 Workshop on The Future of Collaborative Software Development*, 2012, 3 pages.

[S5] **MISE '08:** Laura K. Dillon, R. E. K. Stirewalt, Eileen Kraemer, Shaohua Xie, and **Scott D. Fleming**. "Using Formal Models to Objectively Judge Quality of Multi-Threaded Programs in Empirical Studies." In *Proc. 2nd Workshop on Modeling in Software Engineering*, 2008, 6 pages. DOI: 10.1145/1370731.1370740.

[S4] **WEASELTech '07: Scott D. Fleming**, R. E. K. Stirewalt, and Eileen T. Kraemer. "Toward a Task Model of Concurrent Software Maintenance." In *Proc. 1st Workshop Empirical Assessment of Software Engineering Languages and Technologies*, 2007, 2 pages. DOI: 10.1145/1353673.1353679.

[S3] **ACoM '07: Scott D. Fleming**, R. E. K. Stirewalt, and Laura K. Dillon. "Using Program Families for Maintenance Experiments." In *Proc. 1st Int'l Workshop Assessment of Contemporary Modularization Techniques*. 2007, 2 pages. DOI: 10.1109/ACOM.2007.12.

[S2] **Alloy '06:** Laura K. Dillon, R. E. K. Stirewalt, Beata Sarna-Starosta, and **Scott D. Fleming**. "Developing an Alloy Framework Akin to OO Frameworks." In *Proc. 1st Alloy Workshop*, 2006, 10 pages.

[S1] **DEAS '05: Scott D. Fleming**, Betty H. C. Cheng, R. E. Kurt Stirewalt, and Philip K. McKinley. "An Approach to Implementing Dynamic Adaptation in C++." In *Proc. 2005 Workshop Design and Evolution of Autonomic Application Software*. 2005, 7 pages. DOI: 10.1145/1083063.1083089.

Invited Presentations and Attendance

2022 **Invited Attendee, Dagstuhl Seminar**
Seminar 22231: Theories of Programming Austin, Texas. Dagstuhl, Germany.

2018 **Invited Attendee, Dagstuhl Seminar**
Seminar 18061: Evidence About Programmers for Programming Language Design. Dagstuhl, Germany.

2015 **Invited Speaker, National Instruments Corporation**
"A Human-Oriented Approach to Programmer Navigation and Information Seeking," Austin, Texas.

2014 **Invited Speaker, ABB Corporation**
"Speeding Up Code Navigation with Patchworks," Raleigh, North Carolina.

2010 **Panelist, PPIG**
22nd Annual Psychology of Programming Interest Group, Madrid, Spain.

2008 **Invited Speaker, Wayne State University**
"An Empirical Investigation of Strategies for Debugging Multithreaded Programs," Detroit, Michigan.

Students Advised

As Major Professor:

Ph.D Austin Henley, 2018

M.S. Thesis Advisees Graduated: 3

M.S. Project Advisees Graduated: 17

As Committee Member:

Ph.D. Students Graduated:
- University of Memphis: 12
- Oregon State University: 2

M.S. Students Graduated:
- University of Memphis: 34
- Oregon State University: 2

Teaching Experience

University of Memphis:

COMP 4040 Programming Languages (F13)

COMP 4081 Software Engineering (F11, F12, F13, F14, F15, F16, F18, S19, F19, S20, S21, F21, S22)

COMP 4882 Software Capstone Project (S12, S13, S14, S15, S16, S17, S18)

COMP 7012 Foundations of Software Engineering (S12, S13, S14, S15, S16, S17, S18, S19, S20, S21, S22, F22, S23)

COMP 7085 Program Comprehension (F12, F14, F15, F16, F17)

COMP 7999 CS Education Research (F17)

Michigan State University (As Instructor):

CSE 335 Object-Oriented Software Design (S09)

Michigan State University (As Teaching Assistant):

CSE 240 Informatics (F03)

Western Michigan University (As Instructor):

CS 111 Computer Science I (F02, S03)

CS 112 Computer Science II (F01, S02, F02, S03)

CS 331 Data and File Structures (S02)

Western Michigan University (As Teaching Assistant):

CS 111 Computer Science I (F00, S01)

CS 112 Computer Science II (F99, S00, F00)

Professional Service

Journals:

TSE IEEE Transactions on Software Engineering
- ★ **Review Board: 2017–2023**
- ○ Reviewer: 2012–2015

EMSE Empirical Software Engineering Journal
- ★ **Editorial Board: 2020–2023**
- ○ Reviewer: 2012–2014, 2018–2019

COLA Journal of Computer Languages
- ○ Reviewer: 2022

TOCE ACM Transactions on Computing Education
- ○ Reviewer: 2020

CSE Computer Science Education (Taylor & Francis Journal)
- ○ Reviewer: 2019–2020

IEEE Softw IEEE Software
- ○ Reviewer: 2020

JSS Journal of Systems and Software
- ○ Reviewer: 2015, 2016

VLSS Journal of Visual Languages and Sentient Systems
- ○ Reviewer: 2016

FORM Formal Methods in System Design (Springer Journal)
- ○ Reviewer: 2015

TiiS ACM Transactions on Interactive Intelligent Systems
- ○ Reviewer: 2015

TOSEM ACM Transactions on Software Engineering and Methodology
- ○ Reviewer: 2014

TOCHI ACM Transactions on Computer-Human Interaction
- ○ Reviewer: 2012

International Conferences and Workshops:

VL/HCC IEEE Symp. on Visual Languages and Human-Centric Computing
- ★ **Steering Committee Chair: 2020–2023**
- ★ **Steering Committee: 2020–2024**
- ★ **General Chair: 2019**
- ★ **Program Co-Chair: 2015**
- ★ **Program Committee: 2013, 2014, 2016–2018, 2020–2023**
- ○ Graduate Consortium Chair: 2013, 2018
- ○ Publication Chair: 2014
- ○ Social Media Chair: 2016
- ○ Graduate Consortium Panelist: 2014, 2016, 2017

SIGCSE ACM Technical Symposium on Computer Science Education
- ○ Reviewer: 2021–2023

CHASE Int'l Conf. on Cooperative and Human Aspects of Software Engineering
- ★ **Program Committee: 2021**

ICPC IEEE Int'l Conf. on Program Comprehension
- ★ **Program Committee: 2011, 2012, 2018**
- ○ Education Program Committee: 2021
- ○ Tool Demonstrations Chair: 2009

IUI ACM International Conference on Intelligent User Interfaces
- ★ **Program Committee: 2019**
- ○ Reviewer: 2015

CHI ACM SIGCHI Conf. on Human Factors in Computing Systems
- ○ Reviewer: 2012, 2014–2019
- ○ Works-in-Progress Reviewer: 2012

ICSE ACM/IEEE Int'l Conf. on Software Engineering
- ○ Software Engineering in Society (SEIS) Program Committee: 2015–2017
- ○ Workshops Selection Committee: 2013, 2014
- ○ New Faculty Symposium Panelist: 2016

VISSOFT IEEE Working Conference on Software Visualization
- ○ New Ideas and Emerging Results, and Tool Demos (NIER/Tool) Program Committee: 2017

ICSME IEEE Int'l Conf. on Software Maintenance and Evolution
- ○ New Ideas and Emerging Results (NIER) Program Committee: 2017
- ○ Early Research Achievements (ERA) Program Committee: 2016

CSCW ACM Conf. on Computer Supported Collaborative Work and Social Computing
- ○ Reviewer: 2014

UIST ACM Symp. on User Interface Software and Technology
- ○ Reviewer: 2014

DIS ACM Conf. on Designing Interactive Systems
- ○ Reviewer: 2014

HCSE Int'l Conf. on Human-Centered Software Engineering
- ○ Program Committee: 2014

SEKE Int'l Conf. on Software Engineering and Knowledge Engineering
- ○ Program Committee: 2011–2013

IS-EUD Int'l Symp. on End-User Development
- ○ Publicity Co-Chair: 2013

Diagrams Int'l Conf. on the Theory and Application of Diagrams
- ○ Reviewer: 2012

EUD4Services Int'l Workshop on End User Development for Services
- ○ Program Committee: 2011

EUSES Annual Meeting of the EUSES Consortium (End Users to Shape Effective Software)
- Assistant Organizer: 2009

ASE IEEE/ACM Int'l Conf. on Automated Software Engineering
- Webmaster: 2007

Grant Proposal Review Boards and Panels:

NSF National Science Foundation
- CISE/CCF: 2015

University Service

University of Memphis:

- Graduate Coordinator (CS Dept): 2018–present
- Graduate Committee (CS Dept): 2011–2017, 2018–present
- College of Arts and Sciences Council for Research and Graduate Studies: 2016–2017, 2019–present
- Undergraduate Committee (CS Dept): 2017–2018
- Self-Assessment and Goals Committee (CS Dept): 2013–2015
- Faculty Awards Committee (CS Dept): 2014–2015
- Faculty Search Committee (CS Dept): 2015–2019
- Search Committee (Non-Tenure Track CS Faculty): 2014