Gregory Gay

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Research Interests:

Automated software testing and analysis, search-based software engineering, automated test generation, data analytics, optimization, information retrieval.

Teaching Interests:

Software engineering, software testing, software verification & validation, software design principles, artificial intelligence, data structures, programming languages.

Education:

- Ph.D. Computer Science, University of Minnesota, Minneapolis, Minnesota, 2015.
  Advisor: Dr. Mats Heimdahl.
  Thesis title: *Steering Model-Based Oracles to Admit Real Program Behaviors.*
- M.S. Computer Science, West Virginia University, Morgantown, West Virginia, 2010.
  Advisor: Dr. Tim Menzies.
  Thesis title: *Robust Optimization of Non-Linear Requirements Models.*
- B.S. Computer Science, West Virginia University, Morgantown, West Virginia, 2008.

Professional Experience:

2019–Present Assistant Professor, Chalmers and the University of Gothenburg, Gothenburg, Sweden.
Software Engineering Division, Department of Computer Science & Engineering

2015–2019 Assistant Professor, University of South Carolina, Columbia, SC.
Department of Computer Science & Engineering

2010–2015 Research Assistant, University of Minnesota, Minneapolis, MN.
Critical Systems Group (under Mats Heimdahl)

2010 Visiting Researcher, Chinese Academy of Sciences, Beijing, PRC.
Lab for Internet Software Technologies, Institute of Software

2009 Intern, National Aeronautics and Space Administration (NASA), Mountain View, CA.
Robust Software Engineering Group, Ames Research Center

2007–2010 Research Assistant, West Virginia University, Morgantown, WV.
Modeling Intelligence Lab (under Tim Menzies)

2006–2007 Research Assistant, West Virginia University, Morgantown, WV.
Virtual Environments Lab (under Francis Van Scoy)

2005 SEAP Intern, National Aeronautics and Space Administration (NASA), Fairmont, WV.
Independent Verification & Validation Center

Teaching Experience:

For University of Gothenburg courses, review scores are out of 5 points.

Spring 2020 (SP3) Instructor, Software Quality and Testing (Bacehlor, University of Gothenburg).
Course Materials: `https://greg4cr.github.io/courses/spring20dit635/index.html`

Fall 2019 (SP2) Co-Instructor, Miniproject: Team Programming (Bacehlor, University of Gothenburg).
Course Materials: `https://greg4cr.github.io/courses/misc/index.html`

Fall 2019 (SP1) Co-Instructor, Mobile and Web Development (Bacehlor, University of Gothenburg).
Course Materials: `https://greg4cr.github.io/courses/misc/index.html`
Reviews: Awareness of Learning Outcomes - 4.2, Course Structure - 3.4, Teaching Methods - 4.0, Course Literature - 3.9, Appropriate Examination - 3.8, Course Administration - 4.0, Overall Impression - 3.8

For University of South Carolina courses, review scores are out of 5 points.

Spring 2019 Instructor, Software Engineering (Undergraduate).
Course Materials: `https://greg4cr.github.io/courses/spring19csce247/index.html`
Reviews: On Clear Presentation - 4.64, On Preparedness - 4.55, On Effective Use of Time - 4.64, On Enthusiasm - 4.74, On Facilitating Understanding - 4.25, On Clear Answering of Questions - 4.45, On Respect - 4.80

Fall 2018 Instructor, Software Architecture (Graduate).
Course Materials: `https://greg4cr.github.io/courses/fall18csce742/index.html`
Reviews: On Clear Presentation - 5.00, On Preparedness - 5.00, On Effective Use of Time - 5.00, On Enthusiasm - 4.75, On Facilitating Understanding - 4.75, On Clear Answering of Questions - 4.75, On Respect - 5.00

Spring 2018 Instructor, Software Testing and Quality Assurance (Graduate).
Course Materials: `https://greg4cr.github.io/courses/spring18csce747/index.html`
Reviews: On Clear Presentation - 5.00, On Preparedness - 4.95, On Effective Use of Time - 5.00, On Enthusiasm - 4.90, On Facilitating Understanding - 4.81, On Clear Answering of Questions - 4.95, On Respect - 5.00

Fall 2017 Instructor, Seminar on Advances in Computing (Graduate). Course Materials: `https://greg4cr.github.io/courses/fall17csce791/index.html`

Fall 2017 Instructor, Software Engineering (Graduate).
Course Materials: `https://greg4cr.github.io/courses/fall17csce740/index.html`
Reviews: On Clear Presentation - 4.60, On Preparedness - 4.73, On Effective Use of Time - 4.80, On Enthusiasm - 4.60, On Facilitating Understanding - 4.53, On Clear Answering of Questions - 4.87, On Respect - 4.93

Spring 2017 Instructor, Software Testing and Quality Assurance (Graduate).
Course Materials: `https://greg4cr.github.io/courses/spring17csce747/index.html`
Reviews: On Clear Presentation - 4.79, On Preparedness - 4.86, On Effective Use of Time - 4.85, On Enthusiasm - 4.79, On Facilitating Understanding - 4.83, On Clear Answering of Questions - 4.69, On Respect - 4.92

Fall 2016 Instructor, Software Engineering (Graduate).
Course Materials: `https://greg4cr.github.io/courses/fall16csce740/index.html`
Reviews: On Clear Presentation - 4.29, On Preparedness - 4.40, On Effective Use of Time - 4.14, On Enthusiasm - 4.08, On Facilitating Understanding - 4.40, On Clear Answering of Questions - 4.27, On Respect - 4.47

Spring 2016 Instructor, Seminar on Advances in Computing (Graduate).
Course Materials: `https://greg4cr.github.io/courses/spring16csce791/index.html`
Reviews: On Clear Presentation - 4.81, On Preparedness - 4.53, On Effective Use of Time - 4.73, On

Enthusiasm - 4.69, On Facilitating Understanding - 4.63, On Clear Answering of Questions - 4.50, On Respect - 4.75

Spring 2016 Instructor, Software Testing and Quality Assurance (Graduate).
Course Materials: `https://greg4cr.github.io/courses/spring16csce747/index.html`
Reviews: On Clear Presentation - 4.55, On Preparedness - 4.55, On Effective Use of Time - 4.55, On Enthusiasm - 4.64, On Facilitating Understanding - 4.55, On Clear Answering of Questions - 4.64, On Respect - 4.55

Fall 2015 Instructor, Software Engineering (Graduate).
Course Materials: `https://greg4cr.github.io/courses/fall15csce740/index.html`
Reviews: On Clear Presentation - 4.85, On Preparedness - 5.00, On Effective Use of Time - 5.00, On Enthusiasm - 4.92, On Facilitating Understanding - 5.00, On Clear Answering of Questions - 5.00, On Respect - 4.92

For University of Minnesota courses, review scores are out of 6 points.

Spring 2015 Instructor, Software Engineering 1 (Undergraduate/Graduate).
Reviews: On Preparedness - 5.70, On Clear Presentation - 5.22, On Helpful Feedback - 4.97, On Respect - 5.81, On Facilitating Understanding - 4.92, On Stimulating Further Interest in Topic - 4.42

Fall 2014 Teaching Assistant, Software Engineering 1 (Undergraduate/Graduate).
Reviews: On Preparedness - 5.60, On Clear Presentation - 5.60, On Helpful Feedback - 5.70, On Respect - 5.80, On Facilitating Understanding - 5.20, On Stimulating Further Interest in Topic - 5.10

Fall 2013 Teaching Assistant, Software Engineering 1 (Undergraduate/Graduate).
Reviews: On Preparedness - 5.40, On Clear Presentation - 5.14, On Helpful Feedback - 5.38, On Respect - 5.62, On Facilitating Understanding - 5.34, On Stimulating Further Interest in Topic - 5.17

Spring 2013 Teaching Assistant, Software Engineering 2 (Undergraduate/Graduate).
Reviews: On Preparedness - 5.58, On Clear Presentation - 5.58, On Helpful Feedback - 5.67, On Respect - 5.62, On Facilitating Understanding - 5.00, On Stimulating Further Interest in Topic - 4.75

Fall 2012 Teaching Assistant, Software Engineering 1 (Undergraduate/Graduate).
Reviews: On Preparedness - 5.26, On Clear Presentation - 5.23, On Helpful Feedback - 5.23, On Respect - 5.45, On Facilitating Understanding - 5.29, On Stimulating Further Interest in Topic - 4.97

Spring 2012 Participant, University of Minnesota Preparing Future Faculty Program.

Student Supervision:

Ph.D. Advisor

Ongoing Afonso Fontes, Ph.D. in Computer Science (University of Gothenburg), Estimated Graduation: Spring 2025.

Ongoing Hussein Almulla, Ph.D. in Computer Science (University of South Carolina), Estimated Graduation: Fall 2020.

Ongoing Alireza Salahirad, Ph.D. in Computer Science (University of South Carolina), Estimated Graduation: Spring 2021.

Licentiate Committee

2020 Mahshid Helali, Ph.D. in Computer Science (Mälardalen University).

M.S. Advisor

Ongoing Ashish Husain and Martin Tran, M.S. in Software Engineering and Technology (Chalmers University of Technology).

2020 Rasmus Jenth, M.S. in Computer Science and Engineering (Chalmers University of Technology).

2019 Burl Kenner III, M.S. in Engineering Management (University of South Carolina).

2018 Srujana Bollina, M.S. in Computer Science (University of South Carolina).

2017 Ying Meng, M.S. in Software Engineering (University of South Carolina).

M.S. Examiner

2018 George Akhvlediani, M.S. in Computer Science (University of South Carolina).

B.S. Advisor

2020 Fabian Daneshmand-Mehr and Daniel Salomons, B.S. in Software Engineering and Management (University of Gothenburg).

2020 Sarkis George Sarkisian, B.S. in Software Engineering and Management (University of Gothenburg).

B.S. Examiner

2020 Chi Hong Chao and Ranim Khojah, B.S. in Software Engineering and Management (University of Gothenburg).

2020 Martin Stanchev and M. Nazeeh Alhosary, B.S. in Software Engineering and Management (University of Gothenburg).

Independent Study Advisor[1]

2018 Hayley Lichtenfels, B.S. in Computer Science (University of South Carolina).

2016 Allen Kanapala, M.S. in Computer Science (University of South Carolina).

2016 Narasimha Chilukuri, M.S. in Software Engineering (University of South Carolina).

2016 Craig Sharp, Ph.D. in Computer Science (University of South Carolina).

Funding:

2020–2024 Vetenskapsrådet (Swedish Research Council), Context-Infused Automated Software Test Generation (Sole PI, 3,900,000 SEK).

2020–Present Software Center, Aspects of Automated Testing (15% of research hours funded on an ongoing basis).

2019–2020 South Carolina NASA EPSCoR, Robust Software Testing of Autonomous Aerospace Robotic Systems Using Transfer Learning (Co-PI, $25,000.00).

2018–2019 University of South Carolina ASPIRE-1, Investigating the Relationship between Real and Synthetic Software Faults (Sole PI, $14,959.00).

2017–2019 National Science Foundation Award CCF-1657299, CRII: SHF: Understanding The Role of Software Test Adequacy Criteria in Search-Based Test Generation (Sole PI, $173,528.00).

Awards:

2019 Best Reviewer, Journal of Systems and Software.

2019 2009-2019 Most Influential Paper Award, 35^{th} International Conference on Software Maintenance and Evolution (ICSME'19)

2018 Graduate Teaching Award, University of South Carolina (Department of Computer Science & Engineering)

2018 Challenge Award Winner, 10^{th} Symposium on Search-Based Software Engineering (SSBSE'18)

[1] An "Independent Study" in the US is similar to a Swedish Bachelor's Thesis in scope and duration.

2018 Best Presentation, 11^{th} International Workshop on Search-Based Software Testing (SBST'18)

2016 Challenge Award Winner, 8^{th} Symposium on Search-Based Software Engineering (SSBSE'16)

2014 Best Presentation, 7^{th} International Workshop on Search-Based Software Testing (SBST'14)

2010–2013 National Science Foundation Graduate Research Fellowship

Conference Committees and Chairmanships:

2020 New Ideas and Emerging Results (NIER) Track Co-Chair, 12^{th} Symposium on Search-Based Software Engineering (SSBSE'20).

2020 Program Committee, 35^{th} International Conference on Automated Software Engineering (ASE'20)

2020 Program Committee, ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (Tool Demonstrations) (ESEC/FSE'20)

2020 Program Committee, 42^{nd} International Conference on Software Engineering (Poster Track) (ICSE'20).

2020 Program Committee, 12^{th} Symposium on Search-Based Software Engineering (Challenge Track) (SSBSE'20)

2020 Program Committee, 12^{th} Symposium on Search-Based Software Engineering (Replications and Negative Results Track) (SSBSE'20)

2019–Present Program Committee, 34^{th} International Conference on Automated Software Engineering (Tool Demonstrations) (ASE'19)

2018–Present Program Committee, Genetic and Evolutionary Computation Conference (GECCO)

2017–Present Program Committee, European Conference on the Applications of Evolutionary Computing (EvoSET Track—Nature-inspired algorithms in Software Engineering and Testing).

2017–Present Program Committee, International Conference on Advances in System Testing and Validation Lifecycle (VALID).

2017–Present Program Committee, International Workshop on Search-Based Software Testing (SBST).

2016–Present Steering Committee, Symposium on Search-Based Software Engineering (SSBSE).

2015–Present Steering Committee, International Workshop on Search-Based Software Testing (SBST).

2019 Co-Chair, 3^{rd} ROSE Festival (Recognizing and Rewarding Open Science in Software Engineering, ESEC/FSE Special Track).

2019 Program Co-Chair, 11^{th} Symposium on Search-Based Software Engineering (SSBSE'19).

2019 General Chair, 6^{th} International Workshop on Requirements Engineering and Testing (RET'19)

2019 Program Committee, ACM SIGSOFT International Symposium on Software Testing and Analysis (Tool Demonstrations) (ISSTA'19)

2019 Program Committee, 1^{st} International Workshop on Software Engineering Intelligence (SEI'19)

2018–2019 Program Committee, 12^{th} International Conference on Software Testing, Verification, and Validation (ICST'19)

2018–2019 Program Committee, 41^{st} International Conference on Software Engineering (Demonstrations Track) (ICSE'19).

2018 Program Co-Chair, 5^{th} International Workshop on Requirements Engineering and Testing (RET'18)

2018 Workshop Co-Chair, 11^{th} International Conference on Software Testing, Verification, and Validation (ICST'18).

2017–2018 Steering Committee Deputy Chair, International Workshop on Search-Based Software Testing (SBST).

2017–2018 Program Committee, International Workshop on Software Analytics (SWAN).

2016–2018 Program Committee, Symposium on Search-Based Software Engineering (SSBSE).

2017 Co-Chair, 4^{th} International Workshop on Requirements Engineering and Testing (RET'17).

2017 Publicity Co-Chair, Symposium on Search-Based Software Engineering (SSBSE).

2016–2017 Steering Committee Chair, International Workshop on Search-Based Software Testing (SBST).

2016 Co-Chair, 9^{th} International Workshop on Search-Based Software Testing (SBST'16).

2016 Program Co-Chair, 3^{rd} International Workshop on Requirements Engineering and Testing (RET'16).

2015 Co-Chair, 8^{th} International Workshop on Search-Based Software Testing (SBST'15).

2015 Program Committee, International Workshop on Actionable Analytics for SE (ACTION'15).

2011–2012 Program Committee, International Conference on Predictive Models in Software Engineering (PROMISE).

2012 North America Publicity Chair, 27^{th} IEEE /ACM International Conference on Automated Software Engineering (ASE'12).

2012 Web Chair, 20^{th} IEEE International Conference on Requirements Engineering (RE'12).

2008–2010 Web Chair, International Conference on Predictive Models in Software Engineering (PROMISE).

Journal Publications:

Names in **bold** are supervised students.

1. **Alireza Salahirad**, **Hussein Almulla**, Gregory Gay. Choosing The Fitness Function for the Job: Automated Generation of Test Suites that Detect Real Faults. *Wiley Software Testing, Verification and Reliability.* Volume 29, Issue 4-5. June-August, 2019. Available online at http://greg4cr.github.io/pdf/19fitness.pdf.
2. **Ying Meng**, Gregory Gay, Michael Whalen. Ensuring the Observability of Structural Test Obligations. *IEEE Transactions on Software Engineering.* Available in Early Access, September 2018 (To Appear in Print). Available online at http://greg4cr.github.io/pdf/18omcdc.pdf.
3. Amanda Schwartz, Daniel Puckett, **Ying Meng**, Gregory Gay. Investigating Faults Missed by Test Suites Achieving High Code Coverage. *Journal of Systems and Software.* Volume 144. October, 2018. Pages 106-120. Available online at http://greg4cr.github.io/pdf/18mutation.pdf.
4. Gregory Gay, Sanjai Rayadurgam, Mats P.E. Heimdahl. Automated Steering of Model-Based Test Oracles to Admit Real Program Behaviors. *IEEE Transactions on Software Engineering.* Volume 43, Number 6. June, 2017. Pages 531-555. Available online at http://greg4cr.github.io/pdf/16steering.pdf.
5. Gregory Gay, Ajitha Rajan, Matt Staats, Michael Whalen, Mats P.E. Heimdahl. The Effect of Program and Model Structure on the Effectiveness of MC/DC Test Adequacy Coverage. *ACM Transactions on Software Engineering and Methodology.* Volume 25, Number 3. August, 2016. Article 25. Available online at http://greg4cr.github.io/pdf/16mcdc.pdf.
6. Gregory Gay, Matt Staats, Michael Whalen, Mats P.E. Heimdahl. Automated Oracle Data Selection Support. *IEEE Transactions on Software Engineering.* Volume 41, Number 11. November, 2015. Pages 1119-1137. Available online at http://greg4cr.github.io/pdf/15oracles.pdf.
7. Gregory Gay, Matt Staats, Michael Whalen, Mats P.E. Heimdahl. The Risks of Coverage-Directed Test Case Generation. *IEEE Transactions on Software Engineering.* Volume 41, Number 8. August, 2015. Pages 803-819. Available online at http://greg4cr.github.io/pdf/15covrisks.pdf.
8. Adam Nelson, Tim Menzies, Gregory Gay. Sharing Experiments Using Open-Source Software. *Software: Practice and Experience.* Volume 41, Number 3. March, 2011. Pages 283–305. Available online at http://greg4cr.github.io/pdf/10ourmine.pdf.

9. Gregory Gay, Tim Menzies, Misty Davies, and Karen Gundy-Burlet. Automatically Finding the Control Variables for Complex System Behavior. *Automated Software Engineering.* Volume 17, Number 4. December, 2010. Pages 1–30. Available from http://www.greg4cr.github.io/pdf/10tar3.pdf.
10. Gregory Gay, Tim Menzies, Omid Jalali, Gregory Mundy, Beau Gilkerson, Martin Feather, and James Kiper. Finding Robust Solutions in Requirements Models. *Automated Software Engineering.* Volume 17, Number 1. March, 2010. Pages 87–116. Available from http://www.greg4cr.github.io/pdf/10keys.pdf.

Conference Publications:

11. Gregory Gay, René Just. Defects4J as a Challenge Case for the Search-Based Software Engineering Community. *Proceedings of 12th Symposium on Search-Based Software Engineering, Challenge Cases Track (SSBSE'20).* Bari, Italy, September 2020. Available from http://greg4cr.github.io/pdf/20d4j.pdf. *Acceptance Rate 52% (34 Submitted, 18 Accepted)*
12. **Hussein Almulla**, Gregory Gay. Generating Diverse Test Suites for Gson Through Adaptive Fitness Function Selection. *Proceedings of 12th Symposium on Search-Based Software Engineering, Challenge Solutions Track (SSBSE'20).* Bari, Italy, September 2020. Available from http://greg4cr.github.io/pdf/20rldiv.pdf. *Acceptance Rate 52% (34 Submitted, 18 Accepted)*
13. **Srujana Bollina**, Gregory Gay. Bytecode-based Multiple Condition Coverage: An Initial Investigation. *Proceedings of 12th Symposium on Search-Based Software Engineering, Replications and Negative Results Track (SSBSE'20).* Bari, Italy, September 2020. Available from http://greg4cr.github.io/pdf/20bmcc.pdf. *Acceptance Rate 52% (34 Submitted, 18 Accepted)*
14. **Ying Meng**, Gregory Gay. Understanding The Impact of Solver Choice in Model-Based Test Generation. *Proceedings of the ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM'20).* Bari, Italy, September 2020. Available from http://greg4cr.github.io/pdf/20solvers.pdf. *Acceptance Rate 21% (123 Submitted, 26 Accepted)*
15. **Hussein Almulla**, Gregory Gay. Learning How to Search: Generating Exception-Triggering Tests Through Adaptive Fitness Function Selection. *Proceedings of the 13th IEEE International Conference on Software Testing, Verification, and Validation (ICST'20).* Porto, Portugal, March 2020. Available from http://greg4cr.github.io/pdf/20icst.pdf. *Acceptance Rate 24% (114 Submitted, 27 Accepted)*
16. **Allen Kanapala**, Gregory Gay. Mapping Class Dependencies for Fun and Profit. *Proceedings of the 10th Symposium on Search-Based Software Engineering, Hot Off the Press Track (SSBSE'18).* Montpellier, France, September 2018. Available from http://greg4cr.github.io/pdf/18coupling.pdf. *Acceptance Rate Unknown.*
17. Gregory Gay. Detecting Real Faults in the Gson Library Through Search-Based Unit Test Generation. *Proceedings of the 10th Symposium on Search-Based Software Engineering, Challenge Track (SSBSE'18).* Montpellier, France, September 2018. Available from http://greg4cr.github.io/pdf/18gson.pdf. *Acceptance Rate Unknown.*
18. **Hussein Almulla**, **Alireza Salahirad**, Gregory Gay. Using Search-Based Test Generation to Discover Real Faults in Guava. *Proceedings of the 9th Symposium on Search-Based Software Engineering, Challenge Track (SSBSE'17).* Paderborn, Germany, September 2017. Available from http://greg4cr.github.io/pdf/17guava.pdf. *Acceptance Rate Unknown.*
19. Gregory Gay. Generating Effective Test Suites by Combining Coverage Criteria. *Proceedings of the 9th Symposium on Search-Based Software Engineering (SSBSE'17).* Paderborn, Germany, September 2017. Available from http://greg4cr.github.io/pdf/17ssbse.pdf. *Acceptance Rate 23% (31 Submitted, 7 Accepted)*
20. Gregory Gay. The Fitness Function for the Job: Search-Based Generation of Test Suites that Detect Real Faults. *Proceedings of the 10th IEEE International Conference on Software Testing, Verification, and Validation (ICST'17).* Tokyo, Japan, March 2017. **Best Paper Nominee**. Available from http://greg4cr.github.io/pdf/17fitness.pdf. *Acceptance Rate 27% (135 Submitted, 36 Accepted)*

21. Gregory Gay. Challenges in Using Search-Based Test Generation to Identify Real Faults in Mockito. *Proceedings of the 8th Symposium on Search-Based Software Engineering, Challenge Track (SSBSE'16).* Raleigh, NC, USA, October 2016. **Best Paper Winner (Challenge Track)**. Available from http://greg4cr.github.io/pdf/16mockito.pdf. *Acceptance Rate Unknown.*

22. Dongjiang You, Sanjai Rayadurgam, Michael Whalen, Mats P.E. Heimdahl, Gregory Gay. Efficient Observability-based Test Generation by Dynamic Symbolic Execution. *Proceedings of the 26th IEEE International Symposium on Software Reliability Engineering (ISSRE'15).* Gaithersburg, MD, USA, November 2015. Available from http://greg4cr.github.io/pdf/15issre.pdf. *Acceptance Rate 32% (172 Submitted, 55 Accepted)*

23. Gregory Gay, Sanjai Rayadurgam, Mats P.E. Heimdahl. Improving the Accuracy of Oracle Verdicts Through Automated Model Steering. *Proceedings of the 29th ACM/IEEE International Conference on Automated Software Engineering (ASE'14).* Vasteras, Sweden, September 2014. Available from http://greg4cr.github.io/pdf/14ase.pdf. *Acceptance Rate 20% (276 Submitted, 55 Accepted)*

24. Gregory Gay, Sanjai Rayadurgam, Mats P.E. Heimdahl. Steering Model-Based Oracles to Admit Real Program Behaviors. *Proceedings of the 36th ACM/IEEE International Conference on Software Engineering, NIER Track (ICSE'14-NIER).* Hyderabad, India, June 2014. Available from http://greg4cr.github.io/pdf/14nier.pdf. *Acceptance Rate 24% (146 Submitted, 35 Accepted)*

25. Michael Whalen, Gregory Gay, Dongjiang You, and Mats P.E. Heimdahl. Observable Modified Condition/Decision Coverage. *Proceedings of the 35th ACM/IEEE International Conference on Software Engineering (ICSE'13).* San Francisco, United States, May 2013. Available from http://greg4cr.github.io/pdf/13omcdc.pdf. *Acceptance Rate 19% (461 Submitted, 85 Accepted)*

26. Matt Staats, Gregory Gay, and Mats P.E. Heimdahl. Automated Oracle Creation Support, or: How I Learned to Stop Worrying About Fault Propagation and Love Mutation Testing. *Proceedings of the 34th ACM/IEEE International Conference on Software Engineering (ICSE'12).* Zurich, Switzerland, May 2012. Available from http://greg4cr.github.io/pdf/12oracle.pdf. *Acceptance Rate 21% (408 Submitted, 87 Accepted)*

27. Matt Staats, Gregory Gay, Michael Whalen, and Mats P.E. Heimdahl. On the Danger of Coverage Directed Test Case Generation. *Proceedings of the 15th International Conference on Fundamental Approaches to Software Engineering (FASE'12).* Talinn, Estonia, March 2012. Available from http://greg4cr.github.io/pdf/12danger.pdf. *Acceptance Rate 25% (134 Submitted, 33 Accepted)*

28. Ekrem Kocaguneli, Gregory Gay, Tim Menzies, Ye Yang, and Jacky Keung. When to Use Data from Other Projects for Effort Estimation. Short Paper, *Proceedings of the 25th ACM/IEEE International Conference on Automated Software Engineering (ASE'10).* Antwerp, Belguim, September 2010. Available from http://greg4cr.github.io/pdf/10ccwc.pdf. *Acceptance Rate 18% (191 Submitted, 34+31 Accepted)*

29. Gregory Gay. A Baseline Method For Search-Based Software Engineering. *Proceedings of the 6th International Conference on Predictive Models in Software Engineering (PROMISE'10).* Banff, Canada, September 2010. Available from http://greg4cr.github.io/pdf/10baseline.pdf. *Acceptance Rate 36% (53 Submitted, 19 Accepted)*

30. Jia Chen, Ye Yang, Wen Zhang, Gregory Gay. Measuring the Heterogeneity of Crosscompany Datasets. *Proceedings of the 11th International Conference on Product Focused Software Development and Process Improvement (PROFES'10).* Limerick, Ireland, June 2010. Available from http://greg4cr.github.io/pdf/10profes.pdf. *Acceptance Rate Unknown.*

31. Gregory Gay, Sonia Haiduc, Andrian Marcus, Tim Menzies. On the Use of Relevance Feedback in IR-based Concept Location. *Proceedings of the 25th IEEE International Conference on Software Maintenance (ICSM'09).* Alberta, Canada, September 2009.
Available from http://greg4cr.github.io/pdf/09irrf.pdf. *Acceptance Rate 22% (162 Submitted, 35 Accepted)*

32. Gregory Gay, Tim Menzies, Bojan Cukic, Burak Turhan. How to Build Repeatable Experiments. *Proceedings of the 5^{th} International Conference on Predictive Models in Software Engineering (PROMISE'09).* Vancouver, Canada, May 2009. Available from http://greg4cr.github.io/pdf/09ourmine.pdf. *Acceptance Rate 48% (36 Submitted, 17 Accepted)*

Workshop Publications:

33. Gregory Gay. One-Size-Fits-None? Improving Test Generation Using Context-Optimized Fitness Functions. *Proceedings of the 12th International Workshop on Search-Based Software Testing (SBST'19).* Montreal, Canada, May 2018. Available from http://greg4cr.github.io/pdf/19sbst.pdf. *Acceptance Rate Unknown.*
34. Gregory Gay. To Call, or Not to Call: Contrasting Direct and Indirect Branch Coverage in Test Generation. *Proceedings of the 11th International Workshop on Search-Based Software Testing (SBST'18).* Gothenburg, Sweden, May 2018. Available from http://greg4cr.github.io/pdf/18sbstdbc.pdf. *Acceptance Rate Unknown.*
35. Gregory Gay. Multifaceted Test Suite Generation Using Primary and Supporting Fitness Functions. *Proceedings of the 11th International Workshop on Search-Based Software Testing (SBST'18).* Gothenburg, Sweden, May 2018. Available from http://greg4cr.github.io/pdf/18sbstposition.pdf. *Acceptance Rate Unknown.*
36. Gregory Gay, Matt Staats, Michael Whalen, and Mats P.E. Heimdahl. Moving the Goalposts: Coverage Satisfaction is Not Enough. *Proceedings of the 7th International Workshop on Search-Based Software Testing (SBST'14).* Hyderabad, India, June 2014. Available from http://greg4cr.github.io/pdf/14sbst.pdf. *Acceptance Rate 53% (19 Submitted, 10 Accepted)*
37. Gregory Gay and Mats P.E. Heimdahl. Towards Community-Assisted Software Engineering Decision Making. *Proceedings of the 2^{nd} International Workshop on Realizing Artificial Intelligence Synergies in Software Engineering (RAISE 2013), "Over the Horizon" track.* San Francisco, California, May 2013. Available from http://greg4cr.github.io/pdf/13raise.pdf. *Acceptance Rate Unknown.*
38. Tim Menzies, Burak Turhan, Gregory Gay, Ayse Bener, Bojan Cukic and Yue Jiang. Implications of Ceiling Effects in Defect Predictors. *Proceedings of the 4^{th} International Workshop on Predictive Models in Software Engineering (PROMISE'08).* Leipzig, Germany, May 2008. Available from http://greg4cr.github.io/pdf/08ceiling.pdf. *Acceptance Rate 81% (16 Submitted, 13 Accepted)*

Other Publications:

39. Markus Borg, Elizabeth Bjarnason, Michael Unterkalmsteiner, Tingting Yu, Gregory Gay, Michael Felderer. Summary of the 4th International Workshop on Requirements Engineering and Testing (RET 2017). *ACM SIGSOFT Software Engineering Notes.* Volume 42, Number 4. January, 2018. Pages 28-31.. Available from http://greg4cr.github.io/pdf/18ret.pdf.
40. Michael Unterkalmsteiner, Gregory Gay, Michael Felderer, Elizabeth Bjarnason, Markus Borg, Mirko Morandini. Summary of the 3rd International Workshop on Requirements Engineering and Testing (RET 2016). *ACM SIGSOFT Software Engineering Notes.* Volume 41, Number 3. May, 2016. Pages 31-33.. Available from http://greg4cr.github.io/pdf/16ret.pdf.
41. Gregory Gay, Giuliano Antoniol. 8th International Workshop on Search-based Software Testing (SBST 2015). *Proceedings of the 37^{th} International Conference on Software Engineering (ICSE'15)—Workshop Summaries.* Florence, Italy, May 2015. Available from http://greg4cr.github.io/pdf/sbst-summary.pdf.
42. Gregory Gay. Automated Steering of Model-Based Test Oracles to Admit Real Program Behaviors. *Doctoral Dissertation, University of Minnesota.* Minneapolis, MN, May 2015. Available from http://greg4cr.github.io/pdf/GregoryGayDissertation.pdf.

43. Gregory Gay and Mats P.E. Heimdahl. Towards Community-Assisted Software Engineering Decision Making. *University of Minnesota Tech Report 13-015*. Minneapolis, MN, April 2013. Available from http://greg4cr.github.io/pdf/13raise.pdf.
44. Gregory Gay. The Robust Optimization of Non-Linear Requirements Models.*MS Thesis, West Virginia University*. Morgantown, WV, May 2010. Available from http://greg4cr.github.io/pdf/thesis_v1.pdf.

Invited Presentations:

1. International Conference on Software Engineering. July 2020. Seoul, Soutk Korea.
   Invited Panelist: Student Mentoring Workshop
2. Chalmers University of Technology (Machine Learning Seminar). March 2020. Gothenburg, Sweden.
   Invited Talk: Learning How to Search: Generating Exception-Triggering Tests Through Adaptive Fitness Function Selection
3. Jeppesen Systems AB. December 2019. Gothenburg, Sweden.
   Invited Talk: An Introduction to Search-Based Test Generation
4. SAST Vst. October 2019. Gothenburg, Sweden.
   Invited Talk: A Brief Introduction to Search-Based Test Generation
5. Shonan Seminar 160: Fuzzing and Symbolic Execution: Reflections, Challenges, and Opportunities. September 2019. Kanagawa, Japan.
   Invited Talk: A Brief Introduction to (Metaheuristic) Search-Based Test Generation
6. South Carolina Law Review 2016 Symposium. February 2016. Columbia, SC.
   Panelist: The Science of Cyber Attacks
7. University of Minnesota Graduate Student Colloquium. October 2011. Minneapolis, MN.
   Invited Talk: Software Test Oracles: How I Learned to Stop Worrying and Love Mutation Testing
8. Midwest Verification Day 2011. September 2011. Minneapolis, MN.
   Invited Talk: Towards Oracle Creation Support
9. Tsinghua University School of Software. March 2010. Beijing, PRC.
   Invited Talk: Finding Robust Solutions to Model Optimization Problems
10. Institute of Software, Chinese Academy of Sciences. January 2010. Beijing, PRC.
    Invited Talk: OURMINE: A Toolkit for Sharing Experiments
11. NASA Ames Research Center. August 2009. Mountain View, CA.
    Invited Talk: Automatically finding the control variables for complex system behavior
12. WVU/NETL/ERA Workshop on Digital Preservation of Complex Engineering Data. April 2009. Morgantown, WV. Poster Presentation: Information Retreival with HAMLET

Professional Activities:

2019–Present Member, ACM TOSEM Board of Distinguished Reviewers

2018–Present Reviewer, Traffic Injury Prevention

2018–Present Reviewer, Journal of Software: Evolution and Process

2017–Present Member, Empirical Software Engineering Journal Review Board

2016–Present Reviewer, Journal of Systems and Software

2016–Present Reviewer, IEEE Transactions on Evolutionary Computation

2016–Present Reviewer, Journal of Classification

2015–Present Reviewer, Empirical Software Engineering Journal

2015–Present Reviewer, ACM Transactions on Software Engineering and Methodology

2014–Present Reviewer, IEEE Transactions on Software Engineering

2014–Present Reviewer, Software Testing, Verification and Reliability

2013–Present Reviewer, IEEE Software

2012–Present Reviewer, Software Quality Journal

2010–Present Reviewer, Automated Software Engineering (journal)

2019 Reviewer, IEEE Access

2018 Panelist, NSF Panel P181594 (CRI-SW)

2018 Reviewer, IEEE Transactions on Reliability

2018 Reviewer, Information and Software Technology

2018 Reviewer, Applied Soft Computing Journal

2017 Reviewer, IET Software

2017 Reviewer, The Computer Journal

2017 Reviewer, Formal Methods in System Design

2016 Reviewer, 2017 IFAC World Conference

2014 Reviewer, Automated Software Engineering (conference)

2014 Reviewer, Journal of Aerospace Information Systems

2013 Student Volunteer, International Conference on Software Engineering

2012 Reviewer, Formal Methods for Industrial Critical System

2012 Student Volunteer, 2012 International Symposium on Software Testing and Analysis

2008–2009 President, ACM West Virginia University Student Chapter

2007–2008 Vice-President, ACM West Virginia University Student Chapter

2007–2010 Member, West Virginia University Engineering Student Advisory Council

Affiliate:

- Member of IEEE, ACM, Upsilon Pi Epsilon.