

CURRICULUM VITAE

Sudipto Ghosh

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CV SECTION 1: EMPLOYMENT HISTORY/AWARDS

EDUCATION

2000, Ph.D. Computer Science, Purdue University, West Lafayette, Indiana.

Dissertation: *Testing Component-Based Distributed Applications* (Advisor: Aditya P. Mathur)

1995, M.S. Computer Science, Iowa State University, Ames, Iowa.

Project: *Executing Trait Specifications in the Larch Family of Languages* (Advisor: Albert L. Baker)

1993, B.Tech. Computer Science and Engineering, Indian Institute of Technology, Kanpur, India.

Project: *Terrain Modeling and Path Planning* (Advisor: Sanjay G. Dhande)

ACADEMIC POSITIONS

Jul 2018-Present: Professor, Computer Science, Colorado State University.

Oct 2019-Present: Courtesy Appointment, Systems Engineering, Colorado State University.

Jul 2006-Jun 2018: Associate Professor, Computer Science, Colorado State University.

Aug 2000-Jun 2006: Assistant Professor, Computer Science, Colorado State University.

Aug 1999-May 2000: Teaching Assistant, Computer Science, Purdue University.

Jun 1999: Teaching Assistant, Computer Science, Purdue University.

Jul 1998: Teaching Assistant, Computer Science, Purdue University.

Aug 1995-May 1999: Research Assistant, Software Engineering Research Center, Purdue University.

Aug 1993-May 1995: Teaching Assistant, Computer Science, Iowa State University.

OTHER POSITIONS

Jun 1999-Aug 1999: Summer Intern, Tivoli Systems, Indianapolis.

Jun 1998-Aug 1998: Summer Intern, Tivoli Systems, Indianapolis.

Jun 1997-Aug 1997: Summer Intern, Bell Communications Research, Morristown.

May 1996-Aug 1996: Summer Intern, Bell Communications Research, Morristown.

RESEARCH INTERESTS

Software engineering, data analytics, and computer science education. Specific topics include regression test selection, fault localization, model-based software development, mutation testing, higher order mutation, static analysis for software security, anomaly detection, sensor fusion, pedagogical techniques for introductory CS classes, and team-based software engineering.

CURRENT JOB DESCRIPTION

45% Teaching, 45% Research, 10% Service

HONORS AND AWARDS

1. Top Reviewer Award, Information and Software Technology (Elsevier journal), 2021
2. 2021 SoSyM Best Paper Award, Journal of Software and Systems Modeling presented virtually at MODELS 2021, Fukoka, Japan — Bridging the Model-to-Code Abstraction Gap with Fuzzy Logic in Model-Based Regression Test Selection, W. Cazzola, S. Ghosh, M. Al-Refai, and G. Maurina.
3. Outstanding Reviewer, Information and Software Technology (Elsevier journal), 2014-2015, 2015-2016, 2016-2017
4. Best Paper Award: MODELS 2007 Workshop on Aspect Oriented Modeling (AOM) — A Generic Approach For Automatic Model Composition, F. Fleurey, B. Baudry, R. France, and S. Ghosh.
5. 2000, Maurice H. Halstead Memorial Award for Recognizing Outstanding Research in Software Engineering, Purdue University, West Lafayette, Indiana.
6. 1999-2000, Schlumberger Award for Outstanding Graduate Teaching Assistant in the Department of Computer Sciences, Purdue University, West Lafayette, Indiana.
7. 1999-2000, Outstanding Graduate Teaching Assistant Award, Purdue University, West Lafayette, Indiana.
8. 1998, Jim Nolen Memorial Award from Upsilon Pi Epsilon, California.
9. 1995, Member, inducted to Upsilon Pi Epsilon, Computer Science Honor Society, Purdue University.
10. 1991, Best project award in Engineering Design Project, IIT Kanpur, India.
11. 1990, Academic Proficiency Award, IIT Kanpur, India.
12. 1989, Merit Certificate from IIT Kanpur for high rank in the IIT Joint Entrance Examination, Kanpur, India.
13. 1987, National Talent Scholarship, Government of India.
14. 1987, Merit Certificate and Notional Prize, All India Secondary School Examination, India.

HONORS TO ADVISEES

1. ADQuaTe: An Automated Interactive Data Quality Test Approach, Tapia 2019, 1st Place Graduate ACM Student Research Competition. (PhD Student: Hajar Homayouni)
2. Western Association of Graduate Schools (WAGS)/ProQuest Distinguished Master's Thesis Award (MS Student: Hajar Homayouni)
3. MaRTS: A Model-Based Regression Test Selection Approach, MODELS 2017, 2nd Place Graduate Student ACM Research Competition. (PhD Student: Mohammed Al-Refai)

CV SECTION 2: PUBLICATIONS/SCHOLARLY RECORD

PUBLICATIONS

h-index: 34 (Source Google Scholar, Nov 30, 2022)

In the listing below, Ghosh's advisees and students are marked with *.

Journal Publications

(Impact factors are noted when these are reported on the journal's website.)

- [1] M. Shin*, S. Ghosh, and L. R. Vijayasarathy. An Empirical Comparison of Four Java-based Regression Test Selection Techniques, *Journal of Systems and Software*, vol. 186, 111174, April 2022. (Impact factor: 3.514)
- [2] W. Cazzola, S. Ghosh, M. Al-Refai*, and G. Maurina*. Bridging the Model-to-Code Abstraction Gap with Fuzzy Logic in Model-Based Regression Test Selection, *International Journal on Software and Systems Modeling*, 21(1): 207-224, 2022. (Impact factor: 2.211)
- [3] H. Homayouni*, I. Ray, S. Ghosh, S. Gondalia, and M. Kahn. Anomaly Detection in COVID-19 Time-Series Data, *Springer Nature Computer Science, Artificial Intelligence for Healthcare*, 2:279: 17 pages, Online access 2021.
- [4] M. Al-refai*, S. Ghosh, and W. Cazzola. Supporting Inheritance Hierarchy Changes in Model-based Regression Test Selection, *Software and Systems Modeling*, Springer, 18(2):937-958, 2019. (Impact factor: 1.654)
- [5] E. Omar*, S. Ghosh, and D. Whitley. Subtle Higher Order Mutants, *Special Issue on Mutation Testing, Information and Software Technology*, 81:3-18, January 2017. (Impact factor: 2.694)
- [6] F. Wedyan*, S. Ghosh, and L. Vijayasarathy. An Approach and Tool for Measurement of State Variable Based Data-Flow Test Coverage for Aspect-Oriented Programs, *Information and Software Technology*, vol 59, issue C, pp: 233-253, March 2015. (Impact factor: 2.694)
- [7] S. Lozano-Fuentes, F. Wedyan*, E. Hernandez-Garcia, D. Sadhu*, S. Ghosh, J. Bieman, D. Tep-Chel, Julian Garcia-Rejon and Lars Eisen. Cell Phone-Based System (Chaak) for Surveillance of Immatures of Dengue Virus Mosquito Vectors. *Journal of Medical Entomology*, 50(4):879-889, 2013. (Impact factor: 1.65)
- [8] M. Mortensen*, S. Ghosh, and J. M. Bieman. Aspect-Oriented Refactoring of Legacy Applications: An Evaluation, *IEEE Transactions on Software Engineering*, 38(1):118-140, January-February 2012. (Impact factor: 3.272)
- [9] F. Wedyan* and S. Ghosh. On Generating Mutants for AspectJ Programs, *Information and Software Technology*, vol. 54, pp. 900-914, 2012. (Impact factor: 2.694)
- [10] R. Delamare, B. Baudry, S. Ghosh, S. Gupta*, and Y. Le Traon. An Approach for Testing Point-cut Descriptors in AspectJ, *Journal of Software Testing, Verification and Reliability*, 21(3):215-239, September 2011. (Impact factor: 1.588)
- [11] B. Baudry, S. Ghosh, F. Fleurey, R. B. France, Y. Le Traon, and J.-M. Mottu. Barriers to Systematic Model Transformation Testing, *Communications of the ACM*, 53(6), Virtual Extension, June 2010.
- [12] S. Ghosh and J. L. Kelly*. Bytecode Fault Injection for Java Software, *Journal of Systems and Software*, 81(11):2034-2043, November 2008. (Impact factor: 2.444)
- [13] M. Mortensen*, S. Ghosh, and J. M. Bieman. A Test Driven Approach to Aspectualizing Legacy Software Using Mock Systems, *Information and Software Technology*, 50(7-8): 621-640, 2008. (Impact factor: 2.694)

- [14] O. Pilskalns, A. A. Andrews, A. Knight, S. Ghosh, and R. B. France. Testing UML Designs, *Information and Software Technology*, 49(8):892-912, August 2007. (Impact factor: 2.694)
- [15] D. Simmonds*, A. Solberg, R. Reddy, R. B. France, S. Ghosh, and J. Øyvind Aagedal. Developing Service Oriented Systems Using an Aspect-Oriented Model Driven Framework, *International Journal of Cooperative Information Systems*, Special issue on Enterprise Distributed Computing, 15(4):535-564, December 2006.
- [16] R. B. France, S. Ghosh, T. Dinh-Trong*, and A. Solberg. Model-Driven Development using UML 2.0: Promises and Pitfalls, invited cover feature, *IEEE Computer*, 39(2):59-66, February 2006. (Impact factor: 1.755)
- [17] Y. R. Reddy, S. Ghosh, R. B. France, G. Straw, J. M. Bieman, N. McEachen, E. Song, and G. Georg. Directives for Composing Aspect-Oriented Design Class Models, *Transactions on Aspect Oriented Software Development*, LNCS, Volume 3880, Springer-Verlag, pp. 75-105, 2006.
- [18] S. Ghosh, R. B. France, A. Bare, B. Kamalakar*, R. P. Shankar*, D. M. Simmonds*, G. Tandon*, and S. Yin. A Middleware Transparent Approach for Developing Distributed Applications, *Software — Practice and Experience*, 35(12):1131-1154, Wiley, October 2005. (Impact factor: 1.609)
- [19] R. B. France, I. K. Ray, G. Georg, and S. Ghosh. An Aspect-Oriented Approach to Design Modeling, *IEE Proceedings — Software*, Special Issue on Early Aspects: Aspect-oriented Requirements Engineering and Architecture Design, 151(4):173–185, August 2004. (Now known as *IEE Software*, Impact factor: 0.733)
- [20] D. K. Kim, R. B. France, and S. Ghosh. A UML-Based Language for Specifying Domain-Specific Patterns, *Journal of Visual Languages and Computing*, Special Issue on Domain Modeling With Visual Languages, 15(3-4):265—289, June–August 2004. (Impact factor: 1.171)
- [21] R. B. France, D. K. Kim, E. Song, and S. Ghosh. A UML-Based Pattern Specification Technique, *IEEE Transactions on Software Engineering*, 30(3):193-206, March 2004. (Impact factor: 3.272)
- [22] R. B. France, S. Ghosh, E. Song, and D. K. Kim. A Metamodeling Approach to Pattern-based Model Refactoring, *IEEE Software Special Issue on Model-Driven Development*, 20(5):52-58, September 2003. (Impact factor: 2.19)
- [23] A. Andrews, R. B. France, S. Ghosh, and G. Craig*. Test Adequacy Criteria for UML Design Models, *Journal of Software Testing, Verification, and Reliability*, 13(2):95-127, April-June 2003. (Impact factor: 1.588)
- [24] R. B. France, S. Ghosh, and D. Turk. Supporting Effective Software Modeling, *L’Objet Software, Databases, Networks Journal*, Hermes, 9(4):11-30 2003.
- [25] S. Ghosh and A. P. Mathur. Interface Mutation, *Journal of Software Testing, Verification and Reliability*, 11(3):227-247, December 2001. (Impact factor: 1.588)
- [26] S. Ghosh, N. Bawa*, G. Craig*, and K. Kalgaonkar*. An Extensible Framework for Testing Distributed Java Applications, *Journal of Research and Practice in Information Technology*, Special Issue on Distributed Systems, 33(2):120-132, May 2001.
- [27] H. Agrawal, J. L. Alberi, J. R. Horgan, J. J. Li, S. London, W. E. Wong, S. Ghosh, and N. Wilde. Mining System Tests to Aid Software Maintenance, *IEEE Computer*, 31(7):64-73, July 1998. (Impact factor: 1.755)

Book Chapters

- [1] H. Homayouni*, S. Ghosh, and I. Ray. Data Warehouse Testing, *Advances in Computing*, Vol 112, Edition 1, 2019.
- [2] D. Simmonds, R. France, and S. Ghosh. Using Directives to Implement Model Transformations, *From MDD Concepts to Experiments and Illustrations*, editors: Jean-Philippe Babau, Joel Champeau, and Sebastien Gerard, ISTE Ltd., pp 25-41, 2006.
- [3] S. Ghosh and A. P. Mathur. Fault-based Testing of CORBA Component Software, Book series on Component-Based Software Development, vol. 1, World Scientific Press, pp. 187-210, March 2004.
- [4] R. B. France, D. K. Kim, E. Song, and S. Ghosh. Using Roles to Characterize Model Families, in *Practical foundations of business and system specifications*, Editor Haim Kilov, Kluwer Academic Publishers, September 2003.

Books Edited

- [1] Editors: Sudipto Ghosh, Roberto Natella, Bojan Cukic, Robin Poston, and Nuno Laranjeiro: 29th IEEE International Symposium on Software Reliability Engineering, ISSRE 2018, Memphis, TN, USA, October 15-18, 2018. IEEE.
- [2] Editors: Sudipto Ghosh, Roberto Natella, Bojan Cukic, Robin Poston, and Nuno Laranjeiro: 29th IEEE International Symposium on Software Reliability Engineering Workshops, ISSRE 2018 Workshops, Memphis, TN, USA, October 15-18, 2018. IEEE.
- [3] Editors: Loli Burgueño, Jonathan Corley, Nelly Bencomo, Peter J. Clarke, Philippe Collet, Michalis Famelis, Sudipto Ghosh, Martin Gogolla, Joel Greenyer, Esther Guerra, Sahar Kokaly, Alfonso Pierantonio, Julia Rubin, Davide Di Ruscio: Proceedings of MODELS 2017 Satellite Event: Workshops (ModComp, ME, EXE, COMMitMDE, MRT, MULTI, GEMOC, MoDeVVa, MDETools, FlexMDE, MDEbug), Posters, Doctoral Symposium, Educator Symposium, ACM Student Research Competition, and Tools and Demonstrations co-located with ACM/IEEE 20th International Conference on Model Driven Engineering Languages and Systems (MODELS 2017), Austin, TX, USA, September, 17, 2017. CEUR Workshop Proceedings 2019, CEUR-WS.org 2017
- [4] Editors: R. B. France, S. Ghosh, G. T. Leavens: Proceedings of the 14th International Conference on Modularity, MODULARITY 2015, Fort Collins, CO, USA, March 16 - 19, 2015, ACM.
- [5] Editors: R. B. France, S. Ghosh, G. T. Leavens: Companion Proceedings of the 14th International Conference on Modularity, MODULARITY 2015, Fort Collins, CO, USA, March 16 - 19, 2015, ACM.
- [6] Editors: S. Ghosh. Models in Software Engineering, Workshops and Symposia at MODELS 2009, Denver, CO, USA, October 4-9, 2009, Reports and Revised Selected Papers. Lecture Notes in Computer Science 6002 Springer 2010.
- [7] Editors: S. Ghosh, K. Arnold, and G. R. Gao. Java/Jini Technologies and High-Performance Pervasive Computing, Proceedings of SPIE, vol. 4863, 2002.
- [8] Editors: S. Ghosh. Java/Jini Technologies, Proceedings of SPIE, vol. 4521, 2001.

Editorials

- [1] Roberto Natella and Sudipto Ghosh. Guest Editors' introduction to the Special issue: ISSRE 2018, the 29th IEEE International Symposium on Software Reliability Engineering, Journal of Software Testing, Verification, and Reliability, First published 23 January 2020.
- [2] Sudipto Ghosh and Zhenyu Chen. Special issue on trustworthy systems and software, Software Quality Journal 27(3): 921-922, 2019.
- [3] S. Ghosh and J. J. Li. Guest Editors Introduction to the Special Issue on Program Debugging, Software Quality Journal, 25(1):3-5, 2017.
- [4] A. R. Cavalli and S. Ghosh. Guest editors' introduction to the ICST 2010 Special Issue in Journal of Software Testing, Verification, and Reliability 23(5):351, 2013.
- [5] W. E. Wong, S. Ghosh, and C. O. Sung. Guest editors' introduction to the special section on the software engineering track of the 22nd annual ACM symposium on applied computing (ACM SAC-SE 2007). Software Quality Journal 16(3): 301, 2008.

Conference Publications

- [1] T. Booth and S. Ghosh. A Gradient-Descent Multi-Algorithm Grid Search Optimization of Deep Learning for Sensor Fusion, Proceedings of the IEEE International Systems Conference (to appear), April 17-20, 2023.
- [2] A. Lionelle, S. Ghosh, M. Moraes, T. Winick, and L. Nielsen. Flexible Formative/Summative Grading System for Large Courses, Proceedings of SIGCSE Technical Symposium on Computer Science Education, Toronto, Canada, March 15-18, 2023.
- [3] Gabriele Maurina*, Hajar Homayouni, Sudipto Ghosh, Indrakshi Ray, and Gerald P. Duggan. A Methodology for Energy Usage Prediction in Long-Lasting Abnormal Events, Proceedings of the Fourth IEEE International Conference on Cognitive Machine Intelligence (IEEE CogMI). Virtual Conference, December 14-16, 2022.
- [4] Caleb Carlson, Menuka Warushavithana, Saptashwa Mitra, Kassidy Barram, Sudipto Ghosh, Jay Breidt, Sangmi Lee Pallickara, and Shrideep Pallickara. Resource Efficient Profiling of Spatial Variability in Performance of Regression Models. Proceedings of the IEEE International Conference on Big Data (IEEE BigData). Osaka, Japan. 2022.
- [5] A. Lionelle, S. Ghosh, S. Ourada, W. Musser. Increase Performance and Retention: Teach Students How To Study, Proceedings of the 53rd ACM Technical Symposium on Computer Science Education (SIGCSE TS), pp. 349-355, Providence, Rhode Island, March 2-5, 2022.
- [6] A. Lionelle, S. Ghosh, B. Say, R. Beveridge. Increase Performance in CS 2 via a Spiral Redesign of CS 1, Proceedings of the 53rd ACM Technical Symposium on Computer Science Education (SIGCSE TS), pp. 502-508, Providence, Rhode Island, March 2-5, 2022.
- [7] J. Cuomo, H. Homayouni, I. Ray, and S. Ghosh. Detecting Temporal Dependencies in Data, accepted to the British International Conference on Databases, December 9-10, 2021.
- [8] H. Homayouni*, S. Ghosh, I. Ray, S. Gondalia, J. Duggan, and M. G. Kahn, "An Autocorrelation-Based LSTM-autoencoder for Anomaly Detection in Time Series Data", IEEE Conference on Big Data, Special Session on Machine Learning on Big Data, Virtual Event, December 10-13, 2020.

- [9] H. Homayouni*, S. Ghosh, I. Ray and M. Kahn. “An Interactive Data Quality Test Approach for Constraint Discovery and Fault Detection”, Proceedings of the IEEE International Conference on Big Data, Los Angeles, USA, December 9–12, 2019.
- [10] H. Homayouni*, S. Ghosh, and I. Ray. “ADQuaTe: An Automated Data Quality Test Approach for Constraint Discovery and Fault Detection”, Proceedings of the IEEE 20th International Conference on Information Reuse and Integration for Data Science, Los Angeles, USA, July 30–August 1, 2019. (Acceptance ratio 23.1%).
- [11] H. Homayouni*, S. Ghosh, and I. Ray. An Approach for Testing the Extract-Transform-Load Process in Data Warehouse Systems, Proceedings of 22nd International Database Engineering and Applications Symposium, Villa San Giovanni, Italy, June 16-18, 2018. (Acceptance ratio 37%)
- [12] M. Al-refai*, S. Ghosh, and W. Cazzola. A Fuzzy Logic Based Approach for Model-based Regression Test Selection, Proceedings of ACM/IEEE 20th International Conference on Model Driven Engineering Languages and Systems, Foundations Track, 2017.
- [13] M. Al-refai*, S. Ghosh, and W. Cazzola. Model-based Regression Test Selection for Validating Runtime Adaptation of Software Systems, Proceedings of the 9th IEEE International Conference on Software Testing, Verification, and Validation, pp. 288-298, Chicago, IL, USA, April 10-15, 2016.
- [14] M. Al-refai*, W. Cazzola, S. Ghosh, and R. B. France. Using Models to Validate Unanticipated, Fine-Grained Adaptations at Runtime, Proceedings of the 17th IEEE International Symposium on High Assurance Systems Engineering, pp. 23-30, Orlando, Florida, USA, January 7-9, 2016. (Acceptance rate: 46%)
- [15] A. Jaksic, R. B. France, P. Collet, S. Ghosh. Evaluating the usability of a visual notation when developing new feature models, Proceedings of the 7th International Conference on Software Language Engineering, pp. 122-140, Vasteras, Sweden, September 15-16, 2014. (Acceptance rate: 30%)
- [16] E. Omar*, S. Ghosh and D. Whitley. Comparing Search Techniques for Finding Subtle Higher Order Mutants, Proceedings of the Genetic and Evolutionary Computation Conference, pp. 1271-1278, Vancouver, BC, Canada, July 12-16, 2014. (Acceptance rate: 33%)
- [17] E. Omar*, S. Ghosh and D. Whitley. Constructing Subtle Higher Order Mutants for Java and AspectJ Programs, Proceedings of the 24th IEEE International Symposium on Software Reliability Engineering, pp 340-349, Pasadena, CA, USA, November 4-7, 2013. (Acceptance rate: 35%)
- [18] O. A. L. Lemos, F. C. Zanichelli, R. Rigatto, F. C. Ferrari and S. Ghosh. Visualization, Analysis, and Testing of Java and AspectJ Programs with Multi-Level System Graphs, Proceedings of the 27th Brazilian Symposium on Software Engineering (SBES), Brasilia/DF, Brazil, September 29-October 3, 2013.
- [19] E. Omar* and S. Ghosh. An Exploratory Study of Higher Order Mutation Testing in Aspect-oriented Programming, Proceedings of the 23rd IEEE International Symposium on Software Reliability Engineering (ISSRE 2012), Dallas, TX, November 27-20, 2012.
- [20] S. Lozano-Fuentes, S. Ghosh, J. M. Bieman, D. Sadhu, L. Eisen, F. Wedyan, E. Hernandez-Garcia, J. Garcia-Rejon, D. Tep-Chel. Using Cell Phones for Mosquito Vector Surveillance and Control, Proceedings of the 24th International Conference on Software Engineering & Knowledge Engineering (SEKE'2012), Redwood City, USA July 1-3, 2012.

- [21] A. Bandyopadhyay* and S. Ghosh. Tester Feedback Driven Fault Localization, Proceedings of the 5th IEEE International Conference on Software Testing, Verification and Validation, pp. 41-50, Montreal, Canada, April 17-21, 2012. (Acceptance rate: 28%)
- [22] A. Bandyopadhyay* and S. Ghosh. On the Effectiveness of the Tarantula Fault Localization Technique for Different Fault Classes, Proceedings of the 13th IEEE International High Assurance Systems Engineering Symposium, pp. 317-324, Boca Raton, FL, USA, November 10-12, 2011.
- [23] A. Bandyopadhyay* and S. Ghosh. Proximity Based Weighting of Test Cases to Improve Spectrum Based Fault Localization, Proceedings of the 26th IEEE/ACM International Conference on Automated Software Engineering (ASE), pp. 420-423, Lawrence, KS, USA, November 6-11, 2011. (Acceptance rate: 37 long and 50 short out of 252)
- [24] F. Wedyan* and S. Ghosh. A Dataflow Testing Approach for Aspect-Oriented Programs, Proceedings of the 12th IEEE International High Assurance Systems Engineering Symposium (HASE), pp. 64-73, San Jose, USA, November 1-4, 2010. (Acceptance rate: 24%)
- [25] L. Yu, R. B. France, I. Ray, and S. Ghosh. A Rigorous Approach to Uncovering Security Policy Violations in UML Designs, Proceedings of the 14th International Conference on Engineering of Complex Computer Systems (ICECCS), Potsdam, Germany, June 2-4, 2009.
- [26] R. Delamare, B. Baudry, S. Ghosh, and Y. Le Traon. A Test-Driven Approach to Developing Point-cut Descriptors in AspectJ, Proceedings of the 2nd International Conference on Software Testing, Verification and Validation (ICST), Denver, Colorado, April 1-4, 2009. (Acceptance rate: 33%)
- [27] A. Bandyopadhyay* and S. Ghosh. Test Input Generation using UML Sequence and State Machines Models, Proceedings of the 2nd International Conference on Software Testing, Verification and Validation (ICST), pp. 121-130, Denver, Colorado, April 1-4, 2009. (Acceptance rate: 33%)
- [28] F. Wedyan* and S. Ghosh. A Joinpoint Coverage Measurement Tool for Evaluating the Effectiveness of Test Inputs for AspectJ Programs, Proceedings of the 19th International Symposium on Software Reliability Engineering (ISSRE), pp. 207-212, Seattle, Washington, November 11-14, 2008. (Acceptance rate: 25%)
- [29] J. Hittle* and S. Ghosh. Fault Injection Testing of User-space File Systems Using Traditional and Aspect-based Techniques, Proceedings of the 20th International Conference on Software Engineering and Knowledge Engineering (SEKE), pp. 873-876, Redwood City, CA, July 1-3, 2008.
- [30] A. Bandyopadhyay* and S. Ghosh. Developing Model Transformation Tools Using the UML Meta-model: Challenges and Solutions, Proceedings of Software Engineering and Applications, pp. 545-550, Cambridge, MA, November 19-21, 2007.
- [31] R. B. France, F. Fleury, R. Reddy, B. Baudry, and S. Ghosh. Providing Support for Model Composition in Metamodels, Proceedings of the 11th International EDOC Conference, IEEE Computer Society Press, pp. 253-266, Annapolis, MD, October 15-19, 2007. (Acceptance rate: 33/115)
- [32] M. Mortensen* and S. Ghosh. Refactoring Idiomatic Exception Handling in C++: Throwing and Catching Exceptions with Aspects, Industry Track of the International Conference on Aspect-Oriented Software Development (AOSD), Vancouver, Canada, March 12-16, 2007.
- [33] T. Dinh-Trong*, S. Ghosh, and R. B. France. "A Systematic Approach to Generate Inputs to Test UML Design Models", Proceedings of the 17th International Symposium on Software Reliability

- Engineering (ISSRE), IEEE Computer Society Press, pp. 95-104, Raleigh, NC, November 2006. (Acceptance rate: 38/102)
- [34] M. Mortensen*, S. Ghosh, and J. M. Bieman. “Testing During Refactoring: Adding Aspects to Legacy Systems”, Proceedings of the 17th International Symposium on Software Reliability Engineering (IS-SRE), IEEE Computer Society Press, pp. 221-230, Raleigh, NC, November 2006. (Acceptance rate: 38/102)
- [35] M. Mortensen* and S. Ghosh. Using Aspects with Object-Oriented Frameworks, Proceedings of the Industry Track of the International Conference on Aspect-Oriented Software Development (AOSD), pp. 9-17, Bonn, Germany, March 20-24, 2006.
- [36] C. J. M. Geisterfer and S. Ghosh. Software Component Specification: A Study in Perspective of Component Selection and Reuse, Proceedings of the 5th International Conference on COTS Based Software Systems (ICCBSS), IEEE Computer Society Press, pp. 100-108, Orlando, USA, February 13-17, 2006.
- [37] D. Simmonds*, A. Solberg, R. Reddy, R. B. France, and S. Ghosh. “An Aspect Oriented Model Driven Framework,” Proceedings of the 9th International Enterprise Distributed Object Computing Conference (EDOC 2005), IEEE Computer Society Press, pp. 119-130, Enschede, The Netherlands, September 19-23, 2005. (Acceptance rate: 25/77)
- [38] A. Solberg, D. Simmonds*, R. Reddy, S. Ghosh, and R. B. France. Using Aspect Oriented Techniques to Support Separation of Concerns in Model Driven Development, Proceedings of the 29th Annual International Computer Software and Applications Conference (COMPSAC 2005), IEEE Computer Society Press, pp. 121-126, Vol. 1, Edinburgh, Scotland, July 25-28, 2005. (Acceptance rate: 72/278)
- [39] T. Dinh-Trong*, N. Kawane*, S. Ghosh, R. B. France, and A. A. Andrews. A Tool-Supported Approach to Testing UML Design Models, Proceedings of the 10th IEEE International Conference on Engineering of Complex Computer Systems (ICECCS’05), IEEE Computer Society Press, pp. 519-528, Shanghai, China, June 16-20, 2005. (Acceptance rate: 60/180)
- [40] S. Ghosh, J. Kelly*, and R. Shankar*. Enabling the Selection of COTS Components, *Proceedings of the 4th International Conference on COTS-Based Software Systems (ICCBSS’05)*, Springer Verlag LNCS, pp. 122-131, Bilbao, Spain, February 7-11, 2005.
- [41] B. Kamalakar*, S. Ghosh, and P. Vile*. Middleware Transparent Development of Dependable CORBA Applications, Proceedings of the 15th IEEE International Symposium on Software Reliability Engineering (ISSRE’04), pp. 352-364, IEEE Computer Society Press, St. Malo, France, November 2-5, 2004. (Acceptance rate: 39/120)
- [42] G. Straw, Geri Georg, E. Song, S. Ghosh, R. B. France, and J. M. Bieman. Model Composition Directives, Proceedings of the 7th International Conference on the Unified Modeling Language (UML’04), Springer Verlag LNCS, pp. 84-97, Lisbon, Portugal, October 10-15, 2004. (Acceptance rate: 30/135)
- [43] G. Tandon* and S. Ghosh. Using Subject-Oriented Modeling to Develop Jini Applications, Proceedings of the 8th IEEE International Enterprise Distributed Object Computing Conference (EDOC’04), pp. 111–122, IEEE Computer Society Press, Monterey, USA, September 20-24, 2004.
- [44] S. Ghosh, R. B. France, C. Braganza*, N. Kawane*, A. Andrews, and O. Pilskalns. Test Adequacy Assessment for UML Design Model Testing, In the *Proceedings of the IEEE International Symposium on Software Reliability Engineering (ISSRE’03)*, IEEE Computer Society Press, pp. 332–343, Denver, USA, November 17-20, 2003.

- [45] D. K. Kim, R. B. France, S. Ghosh, and E. Song. A Role-Based Metamodeling Approach to Specifying Design Patterns, In the *27th Annual International Computer Software and Applications Conference (COMPSAC'03)*, IEEE Computer Society Press, pp. 452-457, Dallas, USA, November 3-6, 2003.
- [46] O. Pilskalns, A. Andrews, S. Ghosh, and R. B. France. Rigorous Testing by Merging Structural and Behavioral UML Representations, In the *6th International Conference on the Unified Modeling Language (UML'03)*, Springer Verlag LNCS, pp. 234-248, San Francisco, USA, October 20-24, 2003. (Acceptance rate: 30/143)
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Workshops and Fast Abstracts

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- [2] H. Homayouni*, S. Ghosh, and I. Ray. Using Autoencoder to Generate Data Quality Tests, *Rocky Mountain Celebration of Women in Computing (RMCWIC)*, Denver, USA, November 2–3, 2018.
- [3] M. Al-refai*, A. Jacobson, S. Ghosh, J. M. Bieman, and B. H. C. Cheng. ReMoDD Eclipse Plugin: Collaborative Modeling Using a Model Repository, *Proceedings of MODELS Satellite events (First Workshop on Tools for Model Driven Engineering–MDETools'17)* pp. 344-348, Austin, September 20, 2017.
- [4] H. Homayouni* and S. Ghosh. A Study on EvoSuite as an Automatic Test Case Generation Approach to Kill First Order Mutants, *Rocky Mountain Celebration of Women in Computing*, Salt Lake City, UT, USA, September 22-23, 2016.

- [5] S. Sneham and S. Ghosh. Effect of Code visibility on Coverage and Effectiveness of Automatic Testing Tools, Rocky Mountain Celebration of Women in Computing, Salt Lake City, UT, USA, September 22-23, 2016. (Sneham won an award for best presenter.)
- [6] E. Omar*, S. Ghosh, and D. Whitley. HOMAJ: A Tool for Higher Order Mutation Testing in AspectJ and Java, Proceedings of the ICST 2014 Workshop on Mutation, pp. 165-170, Cleveland, OH, USA, Mar 31-Apr 4, 2014.
- [7] A. Bandyopadhyay* and S. Ghosh. STUDENT PAPER: Using UML Sequence Diagrams and State Machines for Test Input Generation, Proceedings of the 19th International Symposium on Software Reliability Engineering (ISSRE), pp. 309-310, Seattle, Washington, November 11-14, 2008.
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- [10] R. Reddy, A. Solberg, R. B. France, and S. Ghosh. Composing Sequence Models using Tags, MoDELS workshop on Aspect Oriented Modeling, Genova, Italy, October 1-6, 2006.
- [11] B. Baudry, T. Dinh-Trong*, J.-M. Mottu, D. Simmonds*, R. France, S. Ghosh, F. Fleurey, and Y. Le Traon. Model Transformation Testing Challenges, ECMDA workshop on Integration of Model Driven Development and Model Driven Testing, Bilbao, Spain, July 10-13, 2006.
- [12] M. P. Mortensen* and S. Ghosh. Extra-functional Aspects: Design Tradeoffs and Challenges, 5th AOSD Workshop on Aspects, Components, and Patterns for Infrastructure Software, Bonn, Germany, March 20-24, 2006.
- [13] T. Dinh-Trong, S. Ghosh, R. B. France, M. Hamilton, and B. Wilkins. UMLAnT: An Eclipse Plugin for Animating and Testing UML Designs, Eclipse Technology Exchange Workshop in conjunction with OOPSLA, San Diego, October 15-16, 2006. (Acceptance rate: 27/47)
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- [16] T. Dinh-Trong, S. Ghosh, R. B. France, B. Baudry, and F. Fleury. A Taxonomy of Faults for UML Designs, *2nd MoDeVa workshop (Model Design and Validation)*, in conjunction with UML/MoDELS, Montego Bay, Jamaica, October 3, 2005.
- [17] T. Dinh-Trong, S. Ghosh, R. B. France, and A. A. Andrews. Generating test data to test UML Design Models, *2nd MoDeVa workshop (Model Design and Validation)*, in conjunction with UML/MoDELS, Montego Bay, Jamaica, October 3, 2005.

- [18] T. Dinh-Trong, S. Ghosh, R. B. France, and A. A. Andrews. A Systematic Approach to Testing UML Design Models, *4th International Workshop on Critical Systems Development Using Modeling Languages*, in conjunction with SAFECOMP, Fredrikstad, Norway, September 27, 2005.
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- [20] T. Dinh-Trong*, N. Kawane*, S. Ghosh, R. B. France, and A. A. Andrews. “EPTUD: An Eclipse Plugin for Testing UML Designs”, *UML 2004 Satellite Events*, Lisbon, Portugal, *Lecture Notes in Computer Science*, Volume 3297, Springer-Verlag GmbH, 2005.
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- [22] B. Kamalakar* and S. Ghosh. A Middleware Transparent Approach for Developing CORBA-based Distributed Applications, *Workshop on Aspect-Oriented Modeling at the 7th International Conference on the Unified Modeling Language*, Lisbon, Portugal, October 10-15, 2004.
- [23] R. B. France, S. Ghosh, I. Ray, J. M. Bieman, G. Georg, and R. T. Alexander. Evaluating Competing Dependability Concern Realizations in an Aspect-Oriented Modeling Framework (fast abstract), In *the Supplementary Proceedings of the International Symposium on Software Reliability Engineering*, ISSRE 2003, Denver, USA, November 17-20, 2003.
- [24] D. K. Kim, R. B. France, S. Ghosh, and E. Song. A UML-Based Metamodeling Language to Specify Design Patterns. *Workshop in Software Model Engineering (WisME)*, UML 2003, San Francisco, USA, October 20-24, 2003.
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- [27] N. Bawa* and S. Ghosh. Visualizing Interactions in Distributed Java Applications, In *Proceedings of the IEEE International Workshop on Program Comprehension (IWPC'03)*, IEEE Computer Society Press, IEEE Computer Society Press, pp. 292–293, Portland, USA, May 9–10, 2003.
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- [29] S. Ghosh. Fault Insertion in Concurrent Object-Oriented Programs for Mutation Analysis and Testability Measurement, *Proceedings of the 13th IEEE International Symposium on Software Reliability Engineering (ISSRE 2002) Fast Abstracts*, Annapolis, USA, November 12-15, 2002, (fast abstract).
- [30] D. K. Kim, R. B. France, S. Ghosh, and E. Song. Software Component Specification Using Role-Based Modeling Language, *Proceedings of the 11th OOPSLA Workshop on Behavioral Semantics*, Seattle, USA, November 4, 2002.

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- [35] S. Ghosh and A. P. Mathur. Certification of Distributed Component Computing Middleware and Applications, *Proceedings of the 4th Component Based Software Engineering Workshop during ICSE 2001*, May 14-15, 2001, Toronto, Canada.
- [36] S. Ghosh. On Testing Distributed Systems With Broker Architecture, *Proceedings of On-going Student Research, 29th Fault Tolerant Computing Symposium (FTCS)*, June 15-18 1999, Madison, USA (student paper).
- [37] S. Ghosh and A. P. Mathur. Issues in Testing Distributed Component-Based Systems, *Proceedings of the First ICSE Workshop on Testing Distributed Component-Based Systems*, Los Angeles, USA, May 17, 1999.

Invited Workshops

- [1] D. Simmonds*, S. Ghosh, and R. B. France. Middleware Transparent Software Development and the MDA, *Workshop in SIVOES-MDA, UML 2003*, San Francisco, USA, October 20-24, 2003.
- [2] D. Simmonds*, S. Ghosh, and R. B. France. An MDA Framework for Middleware Transparent Software Development and Quality of Service, *Workshop on Qos in Component-Based Software Engineering*, Toulouse, France, June 20, 2003.

Technical Reports

- [1] T. T. Dinh-Trong*, N. Kawane*, S. Ghosh, R. B. France, and A. A. Andrews. A Tool-Supported Approach to Testing UML Design Models, Department of Computer Science, Colorado State University, Technical Report 04-108, October 2004.
- [2] B. Kamalakar* and S. Ghosh. A Middleware Transparent Approach for Developing CORBA-based Distributed Applications, Department of Computer Science, Colorado State University, Technical Report 04-104, April 2004.
- [3] G. Straw, G. Georg, E. Song, S. Ghosh, R. B. France, and J. M. Bieman. Primitives of Composition Directives, Department of Computer Science, Colorado State University, Technical Report 04-103, April 2004.

- [4] S. Ghosh. Testing Component-Based Distributed Applications - A Thesis, SERC Technical Report TR-180-P, August 2000.
- [5] S. Ghosh, P. Govindarajan, and A. P. Mathur. TDS 1.1: A Tool for Testing Distributed Object Systems, SERC Technical Report TR-179P, August 1999.
- [6] S. Ghosh and A. P. Mathur. Testing for Fault Tolerance, SERC Technical Report TR-175P, August 1997.

CONTRACTS AND GRANTS

Funded Projects as PI

1. 2018-2019, “Improving the Efficiency and Effectiveness of ETL Testing in Data Warehouses”, \$80,100.25, Sponsor: University of Colorado at Denver, PI Sudipto Ghosh, co-PI Indrakshi Ray.
2. 2015-2018, “Collaborative Research: CI-ADDO-EN: Research Repository for Model-Driven Software Development (REMODD)”, NSF, \$499,290, PI Sudipto Ghosh since Sept 12, 2017, co-PI James M. Bieman. Sudipto Ghosh was co-PI from 2015-2017.
3. 2010, “Dengue Decision Support System”, Qualcomm gift, \$5,000.
4. 2005, “Providing Support for Executing and Testing UML Designs,” IBM Eclipse Innovation Grant, \$23,500.
5. 2004, “Providing Support for Executing and Testing UML Designs,” IBM Eclipse Innovation Grant, \$20,000.
6. 2002-2003, “Career Enhancement Grant,” Colorado State University, \$2,000.
7. 2001-2002, “A Software Visualization System for CORBA-based Heterogeneous Distributed Applications,” CASI Undergraduate Research, \$2,500.
8. 2001-2002, “Fault Injection Testing of Java Objects,” Faculty Research Grant, Colorado State University, \$4,500.

Funded Projects as co-PI

1. 2020-2021, “COVID-19: RAPID: Ensuring Integrity of COVID-19 Data and News Across Regions.” Indrakshi Ray (PI) and Sudipto Ghosh (co-PI). National Science Foundation, \$199,748. 05/2020-04/2021.
2. 2019-2024, “Frameworks: Collaborative Proposal: Software Infrastructure for Transformative Urban Sustainability Research.” Shrideep Pallickara (PI). Co-PIs: Mazdak Arabi, Sangmi Lee Pallickara, Jay Breidt, Sudipto Ghosh, Mikhail Chester (ASU), Amir AghaKouchak (UC-Irvine), and Claire Welty (UMBC). National Science Foundation. \$3,081,355. 10/2019-9/2024.
3. 2020-2021, “REU Supplement.” Shrideep Pallickara (PI). Co-PIs: Mazdak Arabi, Sangmi Lee Pallickara, Jay Breidt, Sudipto Ghosh \$16,000 4/2020–4/2021 National Science Foundation.

4. 2016-2020, “Enhancing the reliability, efficiency, and usability of Bayesian population PBPK modeling”, \$500,000. Sponsor: HHS-NIH, PI Brad Reisfeld. Co-PIs Frederic Bois, Weihsueh Chiu, Sudipto Ghosh, and Cathie Olschanowsky.
5. 2016-2017, “ETL Testing in Data Warehouses”, \$64,113.62, Sponsor: University of Colorado at Denver, PI Indrakshi Ray. Co-PI Sudipto Ghosh.
6. 2015-2017, “International: Research Experience for US Students at INRIA - REUSSI 2”, NSF, \$50,000, PI Sanjay Rajopadhye. Co-PI Sudipto Ghosh.
7. 2016, VPR Investment Funding Colorado State University: Office of the Vice President, “Creating a CSU Center for Mobile Health Technologies and Applications”, \$10,000, PI Brad Reisfeld. Co-PI Sudipto Ghosh.
8. 2009-2012, “Use of Cell Phones for Field Data Capture in a Dengue Decision Support System”, NIH, \$365,971, PI Lars Eisen. Co-PIs James M. Bieman, Sudipto Ghosh, and Saul Lozano-Fuentes.
9. 2005-2007, “Planning Visits: Collaborative Research on Model Driven Development of Complex Software Systems,” NSF, \$23,000, PI Robert B. France. Co-PIs James M. Bieman and Sudipto Ghosh.
10. 2005-2006, Cost Extension for NSF Grant #0203285 “Testing UML Designs”, NSF, \$60,000, PI Robert B. France. Co-PIs Anneliese Andrews and Sudipto Ghosh.
11. 2002-2005, “Testing UML Designs,” NSF Software Engineering and Languages Program, \$300,000, PI Robert B. France. Co-PIs Anneliese Andrews and Sudipto Ghosh.
12. 2005, “Testing UML Designs,” Research Experience for Undergraduates, NSF, \$8,350, PI Robert B. France. Co-PIs Anneliese Andrews and Sudipto Ghosh.
13. 2001-2002, “An Architectural Approach to Reuse of Business and System Models,” Colorado Advanced Software Institute, \$86,000, PI Robert B. France. Co-PIs Sudipto Ghosh and Daniel E. Turk.
14. 2001, “Introducing Computer Science: A Summer Program,” Colorado Institute of Technology, \$20,000, PI Yashwant K. Malaiya. Co-PIs Sudipto Ghosh and Sandy Schleiffers.

Travel Grants

1. 1999, Student Travel Scholarship from the 29th Fault Tolerant Computing Symposium, Madison, Wisconsin.

PRESENTATIONS

Panels

1. 2017, W. E. Wong (moderator), Jeff Voas, Russ Morris, Sudipto Ghosh, Xiaoying Bai, and Zhenyu Chen. Software Reliability Technology Summit on Automated Software Testing and Embedded Software Testing, 4th International Conference on Dependable Systems and Their Applications, October 31–November 2, Beijing, China.
2. 2007, S. Ghosh (moderator), R. B. France, Y. Labiche, F. Weil, and J. Whittle. Evaluating MDE Research: Are We Doing Enough? ACM/IEEE 10th International Conference on Model Driven Engineering Languages and Systems, September 30 - October 5, 2007, Nashville, TN, USA.

3. 2006, B. Murphy (moderator), N. Rouquette, L. Williams, P. Santhanam, J. Richardson, S. Ghosh. The Relevance of Software Modeling to the Software Industry, 17th IEEE Symposium on Software Reliability Engineering, Raleigh, NC, USA.
4. 2005, C. Williams (moderator), C. Campbell, P. Baker, L. Briand, and S. Ghosh. Building better systems: Modeling, Verification, and Testing, ACM/IEEE 8th International Conference on Model Driven Engineering Languages and Systems, October 2-7, Montego Bay, Jamaica.
5. 2004, L. Briand (moderator), S. Ghosh, A. Pretschner, F. Terrier, and Y. Le Traon. Model Driven Verification and Validation, 15th IEEE International Symposium on Software Reliability Engineering, St. Malo, France.

Talks

1. An Empirical Comparison of Four Java-based Regression Test Selection Techniques, Journal First presentation, 37th IEEE/ACM International Conference on Automated Software Engineering, Oakland Center, Michigan, Oct 10-14, 2022.
2. HOMAJ: A Tool for Higher Order Mutation Testing in AspectJ and Java, ICST 2014 Workshop on Mutation, Cleveland, OH, USA, Mar 31-Apr 4, 2014.
3. Constructing Subtle Higher Order Mutants for Java and AspectJ Programs, 24th IEEE International Symposium on Software Reliability Engineering (ISSRE 2013), Pasadena, CA, November 4-7, 2013.
4. An Exploratory Study of Higher Order Mutation Testing in Aspect-oriented Programming, 23rd IEEE International Symposium on Software Reliability Engineering (ISSRE 2012), Dallas, TX, November 27-20, 2012.
5. Research Challenges in Testing Aspect-Oriented Programs, Keynote speech at 6th Latin American Workshop on Aspect-Oriented Software Development, Natal, Brazil, September 23, 2012.
6. RanTGen: A Tool for Random Generation of Valid Object Configurations for Testing Object-Oriented Programs, Invited Talk at Department of Computer Science, University of Texas, Dallas, In conjunction with IEEE Dallas Section and IEEE Reliability Society, Dallas Chapter, 2012 Spring Student Outreach.
7. On the Effectiveness of the Tarantula Fault Localization Technique for Different Fault Classes, 13th IEEE International High Assurance Systems Engineering Symposium, Boca Raton, FL, USA, November 10-12, 2011.
8. Aspect-Oriented Refactoring of Legacy Applications: An Evaluation, presented on November 15, 2010, at University of Alabama, Tuscaloosa.
9. Aspect-Oriented Refactoring of Legacy Applications: An Evaluation, presented on November 16, 2010, at University of Alabama, Birmingham.
10. A Dataflow Testing Approach for Aspect-Oriented Programs, 12th IEEE International High Assurance Systems Engineering Symposium (HASE), San Jose, USA, November 1-4, 2010.
11. A Systematic Approach to Testing UML Designs, keynote speech at Model-Driven Engineering, Verification, and Validation (MoDeVVA 2009) workshop at MODELS 2009, October 5, 2009.

12. A Test Driven Approach to Aspectualizing Legacy Software Using Mock Systems, Invited Talk at IRISA, France, June 8, 2007.
13. A Systematic Approach to Generate Inputs to Test UML Design Models (ISSRE 2006), Raleigh, NC, Nov 7-10, 2006.
14. Testing During Refactoring: Adding Aspects to Legacy Systems (ISSRE 2006), Raleigh, NC, Nov 7-10, 2006.
15. Software Component Specification: A Study in Perspective of Component Selection and Reuse, (IC-CBSS 2007), Orlando, Florida, Feb 23-26, 2006.
16. A COTS Component Comprehension Process, 13th IEEE International Workshop on Program Comprehension (IWPC 2005), St. Louis, MO, May 15-16, 2005.
17. Middleware Transparent Development of Dependable CORBA Applications, 15th IEEE International Symposium on Software Reliability Engineering (ISSRE 2004), St. Malo, France, November 2-5, 2004.
18. An Aspect-Oriented Approach to Developing Middleware-based Applications, OOPSLA and GPCE Workshop on Best Practices for Model Driven Software Development, Vancouver, Canada, October 25, 2004.
19. Model Composition Directives, 7th International Conference On the UML (UML 2005), Portugal, Lisbon, October 11-15, 2004.
20. A Middleware Transparent Approach for Developing CORBA-based Distributed Applications, Workshop on Aspect-Oriented Modeling at the 7th International Conference on the UML, Lisbon, Portugal, October 10-15, 2004.
21. Using Subject-Oriented Modeling to Develop Jini Applications, 8th IEEE International Enterprise Distributed Object Computing (EDOC 2004), Monterey, California, September 20-24, 2004.
22. Test Adequacy Assessment for UML Design Model Testing, International Symposium on Software Reliability Engineering (ISSRE 2003), Denver, November 17-20, 2003.
23. Evaluating Competing Dependability Concern Realizations in an Aspect-Oriented Modeling Framework, International Symposium on Software Reliability Engineering (ISSRE'03), fast abstract, Denver, November 17-20, 2003.
24. Middleware Transparent Software Development and the MDA, Workshop in Software Model Engineering (WisME), UML 2003, San Francisco, October 20-24, 2003.
25. Middleware Transparent Software Development and the MDA, Workshop on SIVOES-MDA, UML 2003, San Francisco, October 20-24, 2003.
26. Validating Run-Time Interactions in Distributed Java Applications, 8th IEEE International Conference on Engineering of Complex Computer Systems, (ICECCS 2002), Greenbelt, MD, December 2-4, 2002.
27. Fault Insertion in Concurrent Object-Oriented Programs for Mutation Analysis and Testability Measurement, 13th IEEE International Symposium on Software Reliability Engineering (ISSRE 2002) Fast Abstracts, Annapolis, November 12-15, 2002.

28. A Model for Understanding Software Components, IEEE International Conference on Software Maintenance (ICSM 2002) Montreal, October 3-6, 2002.
29. Towards Measurement of Testability of Concurrent Object-Oriented Programs using Fault Insertion: A Preliminary Investigation, 2nd IEEE International Workshop on Source Code Analysis and Manipulation (SCAM 2002), IEEE Computer Society Press, Montreal, October 1, 2002.
30. Middleware Transparency through Aspect-Oriented Programming using AspectJ and Jini, SPIE ITCOM Conference on Java/Jini Technologies, Boston, August 1, 2002.
31. Improving Current Component Development Techniques for Successful Component-Based Software Development, 7th International Conference on Software Reuse Workshop on Component-based Software Development Processes, Austin, April 16, 2002.
32. A Test Management and Software Visualization Framework for Heterogeneous Distributed Applications, IEEE High Assurance Systems Engineering 2001, October 22-24, 2001.
33. A Framework for Measuring Test Coverage of Java Applications, IASTED Software Engineering and Applications (SEA 2001), Anaheim, California, August 21-24, 2001.
34. A Testing Tool for Distributed Java Applications, SPIE ITCOM Conference on Java/Jini Technologies, August 22, 2001, Denver, Colorado.
35. Fault Injection Testing for Distributed Object Systems, 34th Conference on Technology of Object-Oriented Languages and Systems (TOOLS USA) 2001, July 29–August 3, 2001, Santa Barbara, California.
36. A Comparison of Java-Based Management Technologies, 2001 International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA 2001), June 25-28, 2001, Las Vegas, Nevada.
37. TDS: A Tool for Testing Distributed Component-Based Applications, MUTATION 2000, October 6-7, 2000, San Jose, CA.
38. Interface Mutation, MUTATION 2000, October 6-7, 2000, San Jose, CA.
39. Interface Mutation to Assess the Adequacy of Tests for Components, 34th Conference on Technology of Object-Oriented Languages and Systems (TOOLS USA) 2000, Santa Barbara, Jul 30-Aug 2, 2000.
40. An Interface-based Testing Methodology for Distributed Component-based Systems, Department of Computer Science, Clemson University, March 2000.
41. An Interface-based Testing Methodology for Distributed Component-based Systems, Department of Computer Science, University of Delaware, March 2000.
42. An Interface-based Testing Methodology for Distributed Component-based Systems, Department of Computer Science and Electrical Engineering, University of Maryland, Baltimore County, March 2000.
43. An Interface-based Testing Methodology for Distributed Component-based Systems, Department of Computer Science, Colorado State University, March 2000.
44. An Interface-based Testing Methodology for Distributed Component-based Systems, Department of Computer Science, Ball State University, February 2000.

45. An Interface-based Testing Methodology for Distributed Component-based Systems, Bell Communications Research, December 1999.
46. Issues in Testing Distributed Component-Based Systems, First ICSE Workshop on Testing Distributed Component-Based Systems, Los Angeles, California, May 17, 1999.
47. On Errors And Failures in Distributed Systems Built to CORBA and COM Standards, International Conference on Software Engineering and its Application, December 19-20, 1997, Hyderabad, India.
48. Software Fault Injection Testing on a Distributed System - A Case Study, First International Software Quality Week Europe, November 4-7 1997, Brussels, Belgium.
49. On Testing Distributed Systems With Broker Architecture, On-going Student Research, 29th Fault Tolerant Computing Symposium (FTCS), June 15-18 1999, Madison, Wisconsin.

Posters and Demonstrations

1. 2018, V. Gaddy, M. Shin, S. Ghosh, and B. Reisfeld, User-Friendly Interface for PBPK Analysis and Simulation (poster and demo), Rocky Mountain Celebration of Women in Computing, Denver, CO, USA.
2. 2016, M. Al-refai, S. Ghosh, and W. Cazzola, Using Models to Validate Unanticipated, Fine-Grained Adaptations at Runtime (poster), IEEE 17th International Symposium on High Assurance Systems Engineering, Orlando, FL, USA.
3. 2016, M. Al-refai, J. M. Bieman, and S. Ghosh, ReMoDD Repository for Model Driven Development (poster and demo), IEEE International Conference on Software Testing, Verification, and Validation, Chicago, IL, USA.
4. 2016, M. Al-refai, S. Ghosh, J. M. Bieman, ReMoDD Tool (demo), IEEE 17th International Symposium on High Assurance Systems Engineering, Orlando, FL, USA.
5. 2016, H. Wang and S. Ghosh, Understanding Characteristics of Suspiciousness Scores of Faulty Program Statements for Automatic Program Repair, Rocky Mountain Celebration of Women in Computing, Salt Lake City, UT, USA.
6. 2011, A. Bandyopadhyay and S. Ghosh, Proximity Based Weighting of Test Cases to Improve Spectrum based Fault Localization, 26th IEEE/ACM International Conference on Automated Software Engineering (ASE 2011), Lawrence, KS, USA.
7. 2010, D. Sadhu, A. Bandyopadhyay, S. Ghosh, R. B. France, Random Generation of Test Inputs for Model Based Unit Testing of Object-Oriented Programs, poster presented at CCWIC 2010, Golden, Colorado.
8. 2004, T. Ding-Trong, N. Kawane, S. Ghosh, R. B. France, and A. A. Andrews. EPTUD: An Eclipse Plugin for Testing UML Designs, poster at the eclipse Technology eXchange (eTX) Reception at the 19th Annual ACM Conference on Object- Oriented Programming, Systems, Languages, and Applications, Vancouver, Canada.
9. 2004, T. Dinh-Trong, N. Kawane, S. Ghosh, R. B. France, A. A. Andrews. EPTUD: An Eclipse Plugin for Testing UML Designs, UML 2004, Lisbon, Portugal.

10. 2000, S. Ghosh, P. Govindarajan, and A. P. Mathur. Interface Mutation Tool, Mutation 2000, San Jose, California.
11. 1997, S. Ghosh and A. P. Mathur. Fault Injection Testing Tool, ACM 97 Expo, San Jose, California.

CV SECTION 3: EVIDENCE OF TEACHING AND ADVISING EFFECTIVENESS

COURSES TAUGHT IN LAST FIVE YEARS

Year	Sem.	Course No.	Title	Cr. Hrs.	Enrollment
2022	Fa	CS164	CS1-Computational Thinking with Java (Lec)	3	50
2022	Fa	CS164	CS1-Computational Thinking with Java (Lab)	1	50
2022	Fa	CS164	CS1-Computational Thinking with Java (Distance)	4	8
2022	Fa	CS163	CS1-No Prior Programming Experience (Distance)	4	23
2022	Fa	CS799	Dissertation	3	1
2022	Fa	SYSE799A	Dissertation (PhD)	2	2
2022	Sp	CS415	Software Testing (Lec)	3	50
2022	Sp	CS415	Software Testing (Lab)	1	50
2022	Sp	CS415	Software Testing (Distance)	4	13
2022	Sp	SYSE799A	Dissertation (PhD)	2	2
2022	So	CS799	Research Seminar in Computer Science	4	2
2021	Fa	SYSE799A	Dissertation (PhD)	3	1
2021	Fa	CS514	Software Product and Process Eval (Lec)	3	4
2021	Fa	CS514	Software Product and Process Eval (Lab)	1	4
2021	Fa	CS514	Software Product and Process Eval (Distance)	4	11
2021	Sp	CS799	Dissertation (PhD)	5	1
2021	Sp	CS498	Independent Research	1	1
2021	Sp	CS415	Software Testing (Lec)	3	18
2021	Sp	CS415	Software Testing (Lab)	1	18
2021	Sp	CS415	Software Testing (Distance)	4	2
2021	Sp	CS165	CS2-Data Structures (Lec)	3	176
2021	Sp	CS165	CS2-Data Structures (Lab)	1	176
2021	Sp	CS165	CS2-Data Structures (Distance)	4	27
2020	Fa	SYSE799A	Dissertation (PhD)	1	2
2020	Fa	CS799	Dissertation (PhD)	1	5
2020	Fa	CS514	Software Product and Process Eval (Lec)	3	23
2020	Fa	CS514	Software Product and Process Eval (Lab)	1	23
2020	Fa	CS514	Software Product and Process Eval (Distance)	4	20

COURSES TAUGHT IN LAST FIVE YEARS (CONTD.)

Year	Sem.	Course No.	Title	Cr. Hrs.	Enrollment
2020	Sp	CS498	Research	1	3
2020	Sp	CS699	Thesis (MS)	1	2
2020	Sp	CS799	Dissertation (PhD)	5	1
2020	Sp	CS165	CS2-Data Structures (Lec and Lab)	4	105
2019	Fa	CS163	Java (CS1) No Prior Programming	4	194
2019	Fa	CS498	Independent Research (UG)	1	3
2019	Fa	CS514	Software Product and Process Eval (Lec)	3	13
2019	Fa	CS514	Software Product and Process Eval (Lab)	1	13
2019	Fa	CS514	Software Product and Process Eval (Distance)	4	8
2019	Sp	CS799	Dissertation (PhD)	1	2
2019	Sp	CS514	Software Product and Process Eval (Lec)	3	7
2019	Sp	CS514	Software Product and Process Eval (Lab)	1	7
2019	Sp	CS514	Software Product and Process Eval (Distance)	4	10
2018	Fa	CS163	Java (CS1) No Prior Programming	4	194
2018	Fa	CS799	Dissertation (PhD)	1	2
2018	Su	CS498	Independent Research (UG)	1	1
2018	Sp	CS799	Dissertation (PhD)	1	2
2018	Sp	CS498	Independent Research (UG)	1	1
2018	Sp	CS495	Independent Study (UG)	1	1
2018	Sp	CS414	Object-Oriented Design (Lec)	3	54
2018	Sp	CS414	Object-Oriented Design (Lab)	1	54
2018	Sp	CS414	Object-Oriented Design (Distance)	4	5

STUDENT ADVISING/GRADUATE SUPERVISION

- Undergraduate Thesis
 1. Nicholas Schneider, 2022
 2. Shlok Gondalia, 2021
 3. Abigail Strand (supported by NIH grant), 2016–2018
 4. Josh Larison, 2015–2016
 5. Alexander Egeland, 2015–2016
 6. Laura Adams (supported by NIH grant and James Sites and Elaine Regelson Undergraduate Research Scholarship), 2011-2012
- Other Undergraduate Research Advisees In the Past 5 Years
 1. Jake Isley (jointly with Indrakshi Ray), 2021 — present
 2. Isaac Jacobson (jointly with Vinayak Prabhu, Indrakshi Ray, and Indrajit Ray), 2021 – present
 3. Shlok Gondalia (James Sites and Elaine Regelseon Undergraduate Research Scholarship), 2019-2020
 4. Jared Crouse (supported by NIH Grant), Summer 2019
 5. Vidya Gaddy (supported by NIH grant), 2018-2019
 6. Kelten Tschanz 2017
 7. Huijun Wang 2016–2017
 8. Kelsey Cribari (supported by NIH grant), 2016–2017

9. Brandt Reutimann (supported by NIH grant), 2017–2018

- Current Graduate Advisees

1. Gabriele Maurina (Computer Science) – PhD
2. Tom Booth (Systems Engineering) – PhD
3. Jason Trout (Systems Engineering) – PhD

- Current Graduate Committee Memberships

- 1 MS in CS
- 4 Ph.D. in CS
- 2 Ph.D. in Systems Engineering
- 1 Outside Member (MS) in Math

- Graduate Degrees Completed Under Supervision

1. Gabriele Maurina (MS Co-Advisor), Università Degli Studi Di Milano, 2021. MS Thesis: *BabelRTS: Developing a Tool for Regression Test Selection for Multi-language Software Projects*
2. Hajar Homayouni (Ph.D. advisor), Co-advisor: Indrakshi Ray, 2021. Ph.D. Dissertation: *Anomaly Detection and Explanation in Big Data*
3. Erica Shin, 2020. MS Thesis: *An Empirical Comparison of Four Java-based Regression Test Selection Techniques.*
4. Mohammad Al-refai, 2019. Ph.D. Dissertation: *Towards Model-Based Regression Test Selection.* Co-advisor: Walter Cazzola, Università degli Studi di Milano.
5. Hajar Homayouni, 2018. MS Thesis: *An Approach for Testing the Extract-Transform-Load Process in Data Warehouse Systems.* Co-advisor: Indrakshi Ray.
6. Elmahdi Farag Omar, 2015, Ph.D. Dissertation: *Constructing Subtle Higher Order Mutants from Java and AspectJ Programs.* (Co-advisor: L. Darrell Whitley).
7. Aritra Bandyopadhyay, 2013, Ph.D. dissertation: *Mitigating the Effect of Coincidentally Correct Test Cases on Spectrum Based Fault Localization.*
8. Devadatta Sadhu, 2011, M.S. thesis: *Random Generation of Valid Object Configurations for Testing Object-Oriented Programs.*
9. Fadi I. Wedyan, 2011, Ph.D. dissertation: *Data-Flow Testing of Aspect-Oriented Programs.*
10. Michael E. Mortensen, 2009, Ph.D. dissertation: *Improving Software Maintainability through Aspectualization.* (Co-advisor: James M. Bieman)
11. Aritra Bandyopadhyay, 2009, MS thesis: *Test Input Generation from UML Design Models.*
12. Trung Thanh Dinh-Trong, 2007, co-advised Ph.D. dissertation: *A Systematic Approach to Testing UML Designs.* (Advisor: Robert B. France).
13. Devon Simmonds, 2007, co-advised Ph.D. dissertation: *A Transformation Language for UML Class Diagrams.* (Advisor: Robert B. France).
14. Gagan Tandon, 2006, MS thesis: *Subject Oriented Development of Middleware-Based Applications.*
15. Nilesh Rameshchandra Kawane, 2005, MS thesis: *EPTUD: An Eclipse Plugin for Testing UML Design Models.*
16. Roopashree Patil Shankar, 2005, MS project: *Understanding Software Components.*
17. Brahmila Kamalakar, 2004, MS thesis: *Aspect-oriented Development of CORBA-based Applications.*
18. Nishant Bawa, 2003, MS project: *On Testing and Visualizing Distributed Java Applications.*
19. Gerald Nichols Craig, 2002, MS project: *RiOT: A Tool For System Level Testing of Distributed Java RMI Applications.*

CV SECTION 4: EVIDENCE OF OUTREACH/SERVICE

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Current Memberships in Professional Societies
 - Association of Computing Machinery
 - IEEE
 - IEEE Computer Society
- Associate Editor:
 - Software Quality Journal, 2011 – Present
- Member, Editorial Board
 - IEEE Transactions on Reliability, 2017 – Present
 - Information and Software Technology, 2008 – Present
 - Journal of Software Testing, Verification, and Reliability, 2006 – 2019
- Volume Editor, MODELS 2009 post-proceedings, LNCS 6002, Springer, appeared in 2010.
- Guest Editor/Co-Editor
 - Guest co-editor for papers selected from ISSRE 2018 for special issue in Journal of Software Testing, Verification, and Reliability, 2020.
 - Guest co-editor for Software Quality Journal Special Issue on Trustworthy Systems and Software, 2019.
 - Guest co-editor for Software Quality Journal Special Issue on Program Debugging, 2017.
 - Guest co-editor for papers selected from ICST 2010 for special issue in Journal of Software Testing, Verification, and Reliability, 2013.
 - Guest Editor for 3 papers in regular issues for Journal on Software and Systems Modeling, Springer.
 - Guest co-editor of special section in Software Quality Journal for papers selected from ACM SAC 2007.
- Grant Review
 - NSF, USA
 - NSERC, Canada
 - CASI, Colorado, USA
 - Austrian Science Fund, Austria
 - Texas Higher Education Advanced Research Program, USA
 - Fundamental Research Program at University of Mons, Belgium
- External Reviewer
 - PhD thesis, University of Queensland, 2019
 - VIDI Program, Innovational Research Incentives Scheme (Vernieuwingsimpuls), 2002
 - Habilitation Thesis, University Of Vienna, Austria, 2004
 - PhD thesis, University of Western Australia, 2012
 - MS thesis, Universidade de São Paulo, Brazil, 2014

- Conference/Workshop Steering Committee
 - International Conference on Modularity (MODULARITY) 2015–2018
 - International Conference on Programming <Programming> 2016–2019
 - Workshop on Model Driven Engineering, Verification, and Validation (MODEVVA) 2012-2016
- Conference General Chair
 - SPIE’s ITCOM 2003 - Conference on Java/Jini Technologies
 - SPIE’s ITCOM 2002 - Conference on Java/Jini Technologies
 - SPIE’s ITCOM 2001 - Conference on Java/Jini Technologies
- Conference General Co-Chair
 - MODULARITY 2015 – 14th International Conference on Modularity
 - MODELS 2009 – ACM/IEEE 12th International Conference on Model Driven Engineering Languages and Systems
- Conference Program Co-Chair
 - ISSRE 2018 – 29th International Symposium on Software Reliability Engineering
 - DSA 2017 – Fourth International Conference on Dependable Systems and Their Applications (sponsored by IEEE Reliability Society)
 - ICST 2010 – IEEE International Conference on Software Testing, Verification and Validation (sponsored by IEEE Computer Society)
- Program Committee Member (Conferences)
 - 27th International Conference on Engineering of Complex Computer Systems (ICECCS 2023)
 - 33rd International Symposium on Software Reliability Engineering (ISSRE 2022) Program Board member
 - IEEE International Conference on Software Quality, Reliability, and Security (QRS 2022)
 - 32nd International Symposium on Software Reliability Engineering (ISSRE 2021) Program Board member
 - IEEE International Conference on Software Quality, Reliability, and Security (QRS 2021)
 - 17th European Conference on Modelling Foundations and Applications (ECMFA 2021)
 - 27th IEEE International Conference on Software Analysis, Evolution, and Reengineering Industry Track Industry Track (SANER 2021)
 - 31st International Symposium on Software Reliability Engineering (ISSRE 2020) Program Board member
 - 16th European Conference on Modelling Foundations and Applications (ECMFA 2020)
 - IEEE International Conference on Software Quality, Reliability, and Security (QRS 2020)
 - 26th IEEE International Conference on Software Analysis, Evolution, and Reengineering Industry Track Industry Track (SANER 2020)
 - 15th European Conference on Modelling Foundations and Applications (ECMFA 2019)
 - IEEE International Conference on Software Quality, Reliability, and Security (QRS 2019)
 - 30th International Symposium on Software Reliability Engineering (ISSRE 2019)
 - 26th IEEE International Conference on Software Analysis, Evolution, and Reengineering Industry Track Industry Track (SANER 2019)
 - IEEE International Conference on Software Quality, Reliability, and Security (QRS 2018)
 - IEEE International Conference on Software Quality, Reliability, and Security (QRS 2017)
 - 28th International Symposium on Software Reliability Engineering (ISSRE 2017)
 - 10th International Conference on Software Testing, Verification, and Validation (ICST 2017)

- 12th European Conference on Modelling Foundations and Applications (ECMFA 2016)
- 9th International Conference on Software Testing, Verification, and Validation (ICST 2016)
- 28th International Conference on Testing Software and Systems (ICTSS 2016)
- 27th International Symposium on Software Reliability Engineering (ISSRE 2016)
- IEEE International Conference on Software Quality, Reliability, and Security (QRS 2016)
- Rocky Mountain Celebration of Women in Computing (RMCWiC 2016)
- Asia-Pacific Software Engineering Conference (APSEC 2015)
- 27th International Conference on Testing Software and Systems (ICTSS 2015)
- IEEE International Conference on Software Quality, Reliability, and Security (QRS 2015)
- 26th International Symposium on Software Reliability Engineering (ISSRE 2015)
- 37th International Conference on Software Engineering (ICSE 2015), New Ideas and Emerging Results (NIER)
- 30th ACM/SIGAPP Symposium On Applied Computing (SAC 2015)
- 25th International Symposium on Software Reliability Engineering (ISSRE 2014)
- 14th International Conference on Quality Software (QSIC 2014)
- Software Engineering In Practice (SEIP), International Conference on Software Engineering (ICSE 2014)
- Testing: Academic & Industrial Conference - Practice and Research Techniques (TAIC PART 2014)
- New Ideas and Emerging Results (NIER), International Conference on Software Engineering (ICSE 2013)
- 6th International Conference on Software Testing, Verification, and Validation (ICST 2013)
- 24th International Symposium on Software Reliability Engineering (ISSRE 2013)
- 13th International Conference on Quality Software (QSIC 2013)
- 23rd International Symposium on Software Reliability Engineering (ISSRE 2012)
- 5th International Conference on Software Testing, Verification, and Validation (ICST 2012)
- ACM/IEEE 15th International Conference on Model Driven Engineering Languages and Systems (MODELS 2012)
- 14th International Conference on Component Based Software Engineering (CBSE 2011)
- 13th IEEE International High Assurance Systems Engineering Symposium (HASE 2011)
- 22nd International Symposium on Software Reliability Engineering (ISSRE 2011)
- 11th International Conference on Quality Software (QSIC 2011)
- 21st International Symposium on Software Reliability Engineering (ISSRE 2010)
- 13th International Conference on Component Based Software Engineering (CBSE 2010)
- 10th International Conference on Quality Software (QSIC 2010)
- ACM/IEEE 13th International Conference on Model Driven Engineering Languages and Systems (MODELS 2010)
- 4th IEEE International Conference on Secure Software Integration and Reliability Improvement (SSIRI 2010)
- 12th International Conference on Component Based Software Engineering (CBSE 2009)
- 3rd IEEE International Conference on Secure Software Integration and Reliability Improvement (SSIRI 2009)
- 9th International Conference on Quality Software (QSIC 2009)
- 2nd International Conference on Software Testing, Verification, and Validation (ICST 2009)
- 19th International Symposium on Software Reliability Engineering (ISSRE 2008)
- 8th International Conference on Quality Software (QSIC) 2008
- 2nd IEEE International Conference on Secure System Integration and Reliability Improvement (SSIRI 2008)

- 23rd Annual ACM Symposium on Applied Computing, SE Track (SAC 2008)
 - First International Conference on Software Testing, Verification, and Validation (ICST 2008)
 - 7th IEEE International Conference on COTS Based Software Systems (ICCBSS 2008)
 - 7th International Conference on Quality Software (QSIC 2007)
 - 18th IEEE International Symposium on Software Reliability Engineering (ISSRE 2007)
 - ACM/IEEE 10th International Conference on Model Driven Engineering Languages and Systems (MoDELS/UML) 2007
 - 22nd Annual ACM Symposium on Applied Computing, SE Track (SAC 2007)
 - 6th IEEE International Conference on COTS-based Software Systems (ICCBSS 2007)
 - First IEEE International Conference on System Integration and Reliability Improvements (SIRI 2006)
 - 17th IEEE International Symposium on Software Reliability Engineering (ISSRE 2006)
 - ACM/IEEE 9th International Conference on Model Driven Engineering Languages and Systems (MoDELS/UML) 2006
 - ACM/IEEE 8th International Conference on Model Driven Engineering Languages and Systems (MoDELS/UML) 2005
 - 29th Annual International Computer Software and Applications Conference (COMPSAC) 2005
 - 16th IEEE International Symposium on Software Reliability Engineering (ISSRE 2005)
 - 15th IEEE International Symposium on Software Reliability Engineering (ISSRE 2004)
 - 13th IEEE International Symposium on Software Reliability Engineering (ISSRE 2002)
 - 10th IEEE International Conference on Computer Communications and Networks (ICCCN 2001)
 - 12th IEEE International Symposium on Software Reliability Engineering (ISSRE 2001)
- Workshop Chair
 - IWPD – International Workshop on Program Debugging at ISSRE 2014 (co-chair)
 - MoDeVVA – Model Design, Verification, and Validation at MoDELS 2008 (co-chair)
 - MoDeVVA – Model Design, Verification, and Validation at MoDELS 2007 (co-chair)
 - MoDeVA – Model Design and Validation at MoDELS 2005 (co-chair)
- Program Committee Member (Workshops)
 - ACM-SRC at SIGCSE TS 2023
 - Mutation Analysis at ICST 2022
 - Software Engineering and AI for Data Quality in Cyber-Physical Systems/Internet of Things at FSE 2022
 - Mutation Analysis at ICST 2021
 - Mutation Analysis at ICST 2020
 - Mutation Analysis at ICST 2019
 - IEEE International Workshop on Debugging and Repair at ISSRE 2018
 - Automation of Software Test (AST) at ICSE 2018
 - Advances in Model-Based Testing (AMOST) at ICST 2018
 - Mutation Analysis at ICST 2018
 - International Workshop on Program Debugging (IWPD) at ISSRE 2017
 - Advances in Model-Based Testing (AMOST) at ICST 2017
 - Mutation Analysis at ICST 2017
 - Modularity in Modeling Workshop at Programming 2017
 - Educators Symposium at MODELS 2017
 - ACM Student Research Competition at ICSE 2016
 - Advances in Model-Based Testing (AMOST) at ICST 2016

- Mutation Analysis at ICST 2016
- Modularity in Modelling Workshop (MOMO) at Modularity 2016
- 8th Brazilian Workshop on Systematic and Automated Software Testing (SAST 2014) at CBSoft 2014
- Posters track at ACM/IEEE 17th International Conference on Model Driven Engineering Languages and Systems
- 4th International Workshop on Regression Testing (Regression 2014) at ICST 2014
- 7th Brazilian Workshop on Systematic and Automated Software Testing, 2013
- 3rd International Workshop on Regression Testing (Regression 2013) at ICST 2013
- 2nd International Workshop on Regression Testing (Regression 2012) at ICST 2012
- 5th International Workshop on Automation of Software Test at ICSE 2010
- Workshop on Quality of Model-Based Testing at ICST 2010
- International workshop on Validation and Verification of Dynamic Software Systems at ICST 2010
- Aspect-Oriented Modeling Workshop at MODELS 2009
- Model-Driven Engineering, Verification, and Validation Workshop at MODELS 2009
- 4th International Workshop on Automation of Software Test at ICSE 2009
- 4th International Workshop on Mutation Analysis at ICST 2009
- Doctoral Symposium at 11th ACM/IEEE Conference on Model Driven Engineering, Languages, and Systems, 2008
- 4th Workshop on Advances in Model-based Software Testing (A-MOST'07) at ICST 2008
- Third International Workshop on Automation of Software Test at ICSE 2008
- Aspect Oriented Modeling Workshop at AOSD 2008
- Eclipse Technology eXchange (ETX) workshop at OOPSLA 2007
- Aspect Oriented Modeling (AOM) workshop at MoDELS 2007
- Second International workshop on Model Size Metrics (MSM) at MoDELS 2007
- Domain-Specific Approaches to Software Test Automation (DoSTA) at ESEC/FSE 2007
- 1st IEEE International Workshop on Testing Emerging Software Technology at COMPSAC 2007
- Second International Workshop on Automation of Software Test at ICSE 2007
- 3rd Workshop on Advances in Model-based Software Testing (A-MOST'06) at ISSSTA 2007
- Aspect Oriented Modeling Workshop at AOSD 2007
- 3rd Workshop on Mutation Analysis at TAIC Part 2007
- 2nd Workshop on Advances in Model-based Software Testing (A-MOST'06) at ISSRE 2006
- 2nd Workshop on Mutation Analysis at ISSRE 2006
- Eclipse Technology Exchange Workshop (eTX) at OOPSLA 2006
- 5th International Workshop on Critical Systems Development Using Modeling Languages at MoDELS 2006
- 2nd International Workshop on Testing and Quality Assurance for Component-based Systems (TQACBS) at COMPSAC 2006
- Aspect Oriented Modeling Workshop at MoDELS 2006
- Aspect Oriented Modeling Workshop at AOSD 2006
- Aspect Oriented Modeling Workshop at MoDELS 2005
- Aspect Oriented Modeling Workshop at AOSD 2005
- Workshop on Quality Assurance and Testing of Web-Based Applications at COMPSAC 2004
- Workshop on Software Cybernetics at COMPSAC 2004
- IEEE Workshop on Source Code Analysis and Manipulation (SCAM 2003)

- Tools and Demo Committee Membership
 - Tool Demonstrations at MODELS 2022
 - Tool Demonstrations at MODELS 2020
 - ICSE Tool Demonstrations Track, 2020
 - Tool Demonstrations at MODELS 2019
- PhD Symposium Co-Chair
 - International Conference on Software Testing, Verification, and Validation (ICST 2015)
- Workshops Chair
 - 19th International Conference on Software Security, Reliability, and Security (QRS 2019)
 - International Symposium on Software Reliability Engineering (ISSRE 2016)
- Student Paper Chair
 - International Symposium on Software Reliability Engineering, 2013
 - International Symposium on Software Reliability Engineering, 2012
- Fast Abstracts Chair or Co-Chair
 - International Symposium on Software Reliability Engineering, 2017 (co-chair)
 - International Symposium on Software Reliability Engineering, 2008
 - International Symposium on Software Reliability Engineering, 2007 (co-chair)
 - International Symposium on Software Reliability Engineering, 2006
 - International Symposium on Software Reliability Engineering, 2005 (co-chair)
- Poster Co-chair
 - ACM/IEEE 16th International Conference on Model Driven Engineering Languages and Systems (MODELS 2013)
- Conference Publications Chair
 - International Symposium on Software Reliability Engineering, 2010
 - International Symposium on Software Reliability Engineering, 2009
- Conference Local Arrangements Chair
 - International Symposium on Software Reliability Engineering, 2003
- Conference Panel Chair
 - ACM/IEEE 11th International Conference on Model Driven Engineering Languages and Systems, 2008
- Conference Publicity Chair
 - 25th IEEE International Conference on Model Driven Engineering Languages and Systems (MODELS) 2022
 - 8th IEEE International Conference on Software Security and Reliability (SERE), 2014
- Conference Tools and Demonstrations Co-Chair
 - ACM/IEEE 20th International Conference on Model Driven Engineering Languages and Systems (MODELS 2017)

- Conference Web Chair
 - 1st International Conference on Software Testing, Verification, and Validation (ICST) 2008
 - ACM/IEEE 8th International Conference on Model Driven Engineering Languages and Systems (MoDELS/UML) 2005
- Journal Reviewer
 - ACM Transactions on Software Engineering and Methodologies
 - IEEE Computer
 - IEEE Internet Computing
 - IEEE Software
 - IEEE Systems, Man and Cybernetics - Part A: Systems and Humans
 - IEEE Transactions on Computers
 - IEEE Transactions on Reliability
 - IEEE Transactions on Software Engineering
 - IET Software
 - Information and Software Technology, Elsevier
 - Information Technology and Management, Springer
 - International Journal of Software Engineering and Knowledge Engineering
 - International Journal of Software Maintenance and Evolution, Wiley
 - International Journal of Computers and Applications, Acta
 - Journal of the Brazilian Computer Society, Springer
 - Journal of Computer Languages
 - Journal of Software Evolution and Process
 - Journal of Software Testing Verification and Reliability, Wiley
 - Journal of Systems and Software, Elsevier
 - Science of Computer Programming, Elsevier
 - Software and Systems Modeling, Springer
 - Software Quality Journal, Springer
 - Software: Practice and Experience, Wiley
 - Transactions of the Society for Modeling and Simulation International
 - Transactions on Aspect-Oriented Software Development, Springer
- IEEE Contest Reviewer
 1. IEEE CHC60 2006
 2. IEEE CSIDC 2006, 2005, 2004, 2003
- Book Reviewer
 - Addison-Wesley Longman
 - McGraw Hill
 - Wiley

INTERNAL SERVICE

- University Committees
 1. ISTeC Research Advisory Committee Co-Chair 2011–Present
 2. ISTeC Distinguished Lecture Sub-committee Chair 2012–Present
 3. ISTeC Research Advisory Committee Member 2010–Present

- College Committees
 1. Scholarship Committee Spring 2022
 2. Scholarship Committee Spring 2020
 3. Scholarship Committee Spring 2019
- Department Committees
 1. Member, Chair Search Committee (2022-2023)
 2. Executive Committee (August 2020–Present)
 3. Chair, Graduate Recruitment Committee (Aug 2021–Present)
 4. Undergraduate Operations 2017–Present
 5. CS Scholar Hiring Committee (Spring–Summer 2021)
 6. Faculty Hiring Committee Fall 2020–Spring 2021
 7. Departmental Action Team Fall 2018–2020
 8. Promotion and Tenure Committee Chair (Aug 2019–July 2020)
 9. Faculty Hiring Committee Fall 2017–Spring 2018
 10. Instructor Hiring Committee Spring 2017
 11. Undergraduate Operations and Diversity Committee 2016–2017
 12. Graduate Recruitment Committee 2016–2019
 13. Chair, Graduate Recruitment Committee 2014–2016
 14. Graduate Program Committee 2013–2014
 15. Operations Committee 2011–2013
 16. Graduate Recruitment Committee 2011–2013
 17. Graduate Program Committee 2010–2011
 18. Awards Committee 2009-2010
 19. Awards Committee 2008-2009
 20. Graduate Committee 2007-2008
 21. Graduate Committee 2006-2007
 22. Facilities Committee 2005-2006
 23. Research Committee 2004-2005
 24. Research Committee 2003-2004
 25. Research Committee 2002-2003
 26. Undergraduate Committee 2001-2002
 27. Research Committee 2000-2001
- Qualifying Examination Committees
 1. Spring 2005, software engineering (chair): 1
 2. Fall 2004, fault tolerant computing: 1
 3. Spring 2004, software engineering: 2
 4. Fall 2003, fault tolerant computing (chair): 3
 5. Spring 2003, fault tolerant computing: 3
 6. Fall 2002, software engineering: 3
 7. Spring 2002, software engineering: 3; computer vision: 1
 8. Spring 2001, computer vision: 1
- Research Examination Committees
 1. Spring 2022: 2 (member)
 2. Fall 2021: 1 (member)
 3. Fall 2020: 1 (member)

4. Spring 2018: 1 (chair)
5. Fall 2012: 2 (member)
6. Spring 2012: 1 (member)
7. Spring 2011: 1 (chair)
8. Spring 2010: 1 (chair)
9. Fall 2006: 1 (chair)

OTHER ACTIVITIES

- Consulting
 - Consultant on network project, Advanced Energy, Fort Collins, Colorado, June-August 2002.
- University Activities
 1. Co-organized NSF-REUSI workshop, Fort Collins, CO, June 2014.
 2. Computer Science co-organizer for RamWelcome, Fall 2010, 2011.
 3. Department newsletter faculty advisor, Fall 2006 and Spring-Summer 2007.
 4. Co-organizer, CS Department Research Poster Symposium, Colorado State University, 2005.
 5. Faculty Advisor, Colorado Beta Chapter of Upsilon Pi Epsilon at Colorado State University, 2002-present.
 6. Faculty Representative, Upsilon Pi Epsilon, Colorado State University, 2001-2002.
 7. Faculty Advisor, Indian Students Association at Colorado State University, 2002-2004.
 8. Faculty Advisor, Thai Students Association at Colorado State University, 2001-2002.
 9. President, Beta Chapter of Upsilon Pi Epsilon at Purdue, 1997-1998.
 10. Historian, Beta Chapter of Upsilon Pi Epsilon at Purdue, 1996-1997.
 11. General Secretary, India Students Association, Iowa State University, 1994-1995.