Curriculum Vitae

Atif M. Memon

I. Personal Information

A. UID, Last Name, First Name, Contact Information

UID	106533587
Last Name	Memon
First Name	Atif
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B. Academic Appointments at UMD

- Professor, Computer Science Department, UMCP.
  July 2015–*present*.
- Professor, Institute for Advanced Computer Studies, UMCP.
  July 2015–*present*.
- Associate Professor, Computer Science Department, UMCP.
  July 2007–June 2015 .
- Associate Professor, Institute for Advanced Computer Studies, UMCP.
  July 2007–June 2015.
- Assistant Professor, Computer Science Department, UMCP.
  August 2001–July 2007.
- Assistant Professor, Institute for Advanced Computer Studies, UMCP.
  August 2001–July 2007.

C. Other Employment

- Visiting Scientist, Google Inc., California, USA.
  January 2016–July 2016.
- Visiting Scientist, Tata Research Development and Design Centre (TRDDC), Pune, India.
  November 2008–January 2009.
- Visiting Scientist, Chinese Academy of Sciences, Beijing, China.
  September 2008–October 2008.

- Scientist, Fraunhofer Center for Empirical Software Engineering, College Park, Maryland.
  August 2001–December 2005.
- Mellon Fellow, Computer Science Department, University of Pittsburgh
  August 1999–August 2001.
- Research Assistant, Computer Science Department, University of Pittsburgh
  August 1998–August 1999.
- Teaching Fellow, Computer Science Department, University of Pittsburgh
  August 1997–August 1998.
- Teaching Assistant, Computer Science Department, University of Pittsburgh
  August 1996–August 1997.
- Lecturer, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia
  December 1995–July 1996.
- Teaching/Research Assistant, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia
  January 1993–December 1995.
- Lecturer/Teaching Assistant, University of Karachi
  January 1992–January 1993.

D. Educational Background

- Ph.D., Computer Science, University of Pittsburgh, 2001.
  Dissertation: *A Comprehensive Framework for Testing Graphical User Interfaces*
  Advisors: *Martha Pollack and Mary Lou Soffa*
- M.S., Computer Science, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, 1995.
  Thesis: *A System for Prototyping Optical Architectures*
  Advisor: *Subbarao Ghanta*
- B.C.S., Computer Science, University of Karachi, 1991.

II. Research, Scholarly, and Creative Activities

†Indicates a student advised, co-advised, or directly supervised by Dr. Memon.

A. Books

i. Books Edited

1. Volume 101: Advances in Computers, 1st Edition; Editor : A Memon; Release Date: Mar. 4, 2016; Imprint: Academic Press; ISBN: 978-0128051696; Pages: 282.

2. Volume 99: Advances in Computers, 1st Edition; Editor : A Memon; Release Date: Sep. 1, 2015; Imprint: Academic Press; ISBN: 978-0128021316; Pages: 260.

3. Volume 97: Advances in Computers, 1st Edition; Editor : A Memon; Release Date: Mar. 12, 2015; Imprint: Academic Press; ISBN: 9780128021330; Pages: 276.

4. Volume 95: Advances in Computers, 1st Edition; Editor : A Memon; Release Date: Sep. 5, 2014; Imprint: Academic Press; ISBN: 0128001607; Pages: 342.

5. Volume 93: Advances in Computers, 1st Edition; Editor : A Memon; Release Date: March 15, 2014; Imprint: Academic Press; ISBN: 0128001623; Pages: 328.

6. Volume 91: Advances in Computers, 1st Edition; Editor : A Memon; Release Date: Sep. 15, 2013; Imprint: Academic Press; ISBN: 0124080898; Pages: 240.

7. Volume 89: Advances in Computers, 1st Edition; Editor : A Memon; Release Date: Apr 10, 2013; Imprint: Academic Press; ISBN: 0124080944; Pages: 242.

8. Volume 86: Advances in Computers, 1st Edition; Editor : A Memon; Release Date: 31 Jul 2012; Imprint: Academic Press; ISBN: 9780123965356; Pages: 312.

9. Volume 85: Advances in Computers, 1st Edition; Editor : A Memon; Release Date: 24 Apr 2012; Imprint: Academic Press; ISBN: 9780123964786; Pages: 408.

ii. Chapters

1. "Advances in automated model-based system testing of software applications with a GUI front-end," Atif M. Memon and Bao N. Nguyen†, *Advances in Computers*, vol. 80, (Marvin V. Zelkowitz, ed.), 2010, pp. 121-162. **(refereed)**

2. "An Event-Flow Model to Test EDS," Atif M. Memon, (Enrique A. Belini ed.), *Software Engineering and Development*, Nova Science Publishers, 2009. **(refereed)**

3. "Advances in Web Testing," Cyntrica Eaton and Atif M. Memon, (M. V. Zelkowitz ed.), Advances in Computers, Academic Press, vol. 75, 2009, pp. 281-306. **(refereed)**

4. "Enhancing Testing Technologies for Globalization of Software Engineering & Productivity," Amir Khan and Atif M. Memon, *Handbook of Research on Software Engineering and Productivity Technologies: Implications of Globalisation*, Information Science Reference, 2009. **(refereed)**

5. "Using Reverse Engineering for Automated Usability Evaluation of GUI-Based Applications," Atif M. Memon, *Software Engineering Models, Patterns and Architectures for HCI*, Springer, 2009. **(refereed)**

6. "Testing Graphical User Interfaces," Jaymie Strecker†and Atif M. Memon, (Mehdi Khosrow-Pour ed.) *Encyclopedia of Information Science and Technology, Second ed.*, IGI Publishing, 2009. **(refereed)**

7. "Agile Quality Assurance Techniques for GUI-Based Applications," Qing Xie†and Atif M. Memon, *Agile Software Development Quality Assurance*, (Ioannis Stamelos and Panagiotis Sfetsos ed.), Idea Group Inc., 2007. **(refereed)**

8. "Automated GUI Regression Testing Using AI Planning," Atif M. Memon, *Artificial Intelligence Methods in Software Testing* , (A. Kandel, H. Bunke and M. Last ed.), World Scientific Series in Machine Perception and Artificial Intelligence, World Scientific Publishing Co., vol. 56, pp. 51–100, 2004. **(refereed)**

9. "A Process and Role-Based Taxonomy of Techniques to Make Testable COTS Components," Atif M. Memon, *Testing Commercial-off-the-shelf Components and Systems*, (S. Beydeda and V. Gruhn ed.), Springer, pp. 109–140, 2004. **(refereed)**

10. "Advances in GUI Testing," Atif M. Memon, *Highly Dependable Software*, (M. V. Zelkowitz ed.), Advances in Computers, Academic Press, vol. 58, pp. 149–201, 2003. **(refereed)**

B. Articles in Refereed Journals

1. "Colluding Apps: Tomorrow's Mobile Malware Threat," by Atif M. Memon and Ali Anwar†, *IEEE Security and Privacy*, vol. 13, no. 6, Nov. 2015, pp. 77-81. **(refereed)**

2. "SITAR: GUI Test Script Repair," by Zebao Gao†, Zhenyu Chen, Yunxiao Zou, and Atif M. Memon, *IEEE Transactions on Software Engineering*, vol. 42, no. 2, pp. 170-186, Feb. 1 2016. **(refereed)**

3. "MobiGUITAR – A Tool for Automated Model-Based Testing of Mobile Apps," by Domenico Amalfitano, Anna Rita Fasolino, Porfirio Tramontana, Bryan Dzung Ta†, and Atif M. Memon, *IEEE Software*, IEEE Computer Society Press. vol. 32, no. 5, pp. 53-59, Sept.-Oct. 2015. **(refereed)**

4. "An Observe-Model-Exercise* Paradigm to Test Event-Driven Systems with Undetermined Input Spaces," by Bao Nguyen†and Atif Memon, *IEEE Transactions on Software Engineering*, vol. 40, no. 3, pp. 216–234, March 2014, IEEE Computer Society. **(refereed)**

5. "Graphical User Interface (GUI) Testing: Systematic Mapping and Repository," by Ishan Banerjee†, Bao Nguyen†, Vahid Garousi, and Atif Memon, *Information and Software Technology*, 2013. **(refereed)**

6. "GUITAR: an innovative tool for automated testing of GUI-driven software," by Bao N. Nguyen†, Bryan Robbins†, Ishan Banerjee†, and Atif Memon, *Automated Software Engineering*, 2013, pp. 1-41, Springer US. **(refereed)**

7. "A Uniform Representation of Hybrid Criteria for Regression Testing," by Sreedevi Sampath, Renee Bryce, and Atif Memon, *IEEE Transactions on Software Engineering*, vol. 39, no. 10, pp. 1326–1344, Oct. 2013, IEEE Computer Society. **(refereed)**

8. "Testing Component Compatibility in Evolving Configurations," Ilchul Yoon, Alan Sussman, and Atif Memon, and Adam Porter, *Information and Software Technology,* vol. 55, number 2, 2013, ACM, pp. 445-458. **(refereed)**

9. "Accounting for Defect Characteristics in Evaluations of Testing Techniques," Jaymie Strecker†and Atif M. Memon, *ACM Transactions on Software Engineering and Methodology,* vol. 21, issue 3, 2012, ACM. **(refereed)**

10. "GUI Interaction Testing: Incorporating Event Context," Xun Yuan†, Myra B. Cohen and Atif M. Memon, *IEEE Transactions on Software Engineering, IEEE Computer Society Press*, vol. 37, no. 4, 2011, pp. 559-574. **(refereed)**

11. "Developing a Single Model and Test Prioritization Strategies for Event-Driven Software," Renee Bryce, Sreedevi Sampath and Atif M. Memon, *IEEE Transactions on Software Engineering, IEEE Computer Society Press*, vol. 37, no. 1, 2011, pp. 48-64. **(refereed)**

12. "Generating Event Sequence-Based Test Cases Using GUI Run-Time State Feedback," Xun Yuan[†]and Atif M. Memon, *IEEE Transactions on Software Engineering, IEEE Computer Society Press*, vol. 36, no. 1, 2010, pp. 81-95. **(refereed)**

13. "Iterative execution-feedback model-directed GUI testing," Xun Yuan[†]and Atif M. Memon, *Journal of Information and Software Technology, Elsevier,* vol. 52, no. 5, 2010, pp. 559–575. **(refereed)**

14. "Automatically repairing event sequence-based GUI test suites for regression testing," Atif M. Memon, *ACM Transactions on Software Engineering and Methodology, Association for Computing Machinery Press,* vol. 18, no. 2, article 4, 2008, pp. 1-36. **(refereed)**

15. "Using a Pilot Study to Derive a GUI Model for Automated Testing," Qing Xie[†]and Atif M. Memon, *ACM Transactions on Software Engineering and Methodology, Association for Computing Machinery Press,* vol. 18, no. 2, article 7, 2008, pp. 1-35. **(refereed)**

16. "Call Stack Coverage for GUI Test-Suite Reduction," Scott McMaster[†]and Atif M. Memon, *IEEE Transactions on Software Engineering, IEEE Computer Society Press*, vol. 34, no. 1, 2008, pp. 99-115. **(refereed)**

17. "Skoll: A Process and Infrastructure for Distributed Continuous Quality Assurance," Adam Porter, Cemal Yilmaz, Atif M. Memon, Douglas C. Schmidt, and Bala Natarajan, *IEEE Transactions on Software Engineering, IEEE Computer Society Press*, vol. 33, no. 8, 2007, pp. 510-525. **(refereed)**

18. "An Event-Flow Model of GUI-Based Applications for Testing," Atif M. Memon, *Software Testing, Verification & Reliability, John Wiley & Sons, Inc.*, vol. 17, no. 3, 2007, pp. 137-157. **(refereed)**

19. "Experimenting with software testbeds for evaluating new technologies," by Mikael Lindvall, Ioana Rus, Paolo Donzelli, Atif Memon, Marvin Zelkowitz, Aysu Betin-Can, Tevfik Bultan, Chris Ackermann, Bettina Anders, Sima Asgari, Victor Basili, Lorin Hochstein, Jrg Fellmann, Forrest Shull, Roseanne Tvedt, Daniel Pech, and Daniel Hirschbach, *Empirical Software Engineering: An International Journal,* vol. 12, no. 4, 2007, pp. 417-444, Kluwer Academic Publishers. **(refereed)**

20. "An Empirical Approach to Testing Web Applications Across Diverse Client Platform Configurations," Cyntrica Eaton[†]and Atif M. Memon, *International Journal on Web Engineering and Technology (IJWET), Special Issue on Empirical Studies in Web Engineering, Inderscience Publishers*, vol. 3, no. 3, 2007, pp. 227-253. **(refereed)**

21. "Designing and Comparing Automated Test Oracles for GUI-based Software Applications," Qing Xie[†]and Atif M. Memon, *ACM Transactions on Software Engineering and Methodology,* vol. 16, no. 1, 2007, ACM Press. **(refereed)**

22. "Reliable Effects Screening: A Distributed Continuous Quality Assurance Process for Monitoring Performance Degradation in Evolving Software Systems," Cemal Yilmaz, Adam Porter, Arvind S. Krishna, Atif M. Memon, Douglas C. Schmidt, Aniruddha Gokhale, and Balachandran Natarajan, *IEEE Transactions on Software Engineering, IEEE Computer Society Press*, vol. 33, no. 2, 2007, pp. 124–141. **(refereed)**

23. "Employing User Profiles to Test a New Version of a GUI Component in its Context of Use," Atif M. Memon, *Software Quality Journal, Springer Inc.* vol. 14, no. 4, pp. 359-377, Dec. 2006. **(refereed)**

24. "Techniques and Processes for Improving the Quality and Performance of Open-Source Software," Cemal Yilmaz, Adam Porter, Atif M. Memon, Arvind S. Krishna, Douglas C. Schmidt, and Aniruddha Gokhale, *Software Process - Improvement and Practice Journal: Special Issue on Free/Open Source Software Processes, John Wiley & Sons, Inc.*, vol. 11, no. 6, pp. 163–176, May 2006. **(refereed)**

25. "Studying the Fault-Detection Effectiveness of GUI Test Cases for Rapidly Evolving Software," Atif M. Memon and Qing Xie†, *IEEE Transactions on Software Engineering, IEEE Computer Society Press,* vol. 31, no. 10, pp. 884-896, Oct. 2005. **(refereed)**

26. "An Evolutionary Testbed for Software Technology Evaluation," Mikael Lindvall, Ioana Rus, Forrest Shull, Marvin Zelkowitz, Paolo Donzelli, Atif Memon, Victor Basili, Patricia Costa, Roseanne Tvedt, Lorin Hochstein, Sima Asgari, Chris Ackermann, Dan Pech, *Innovations in Systems and Software Engineering, Springer Inc.*, vol. 1, no. 1, pp. 3–11, Apr. 2005. **(refereed)**

27. "Preserving Distributed Systems Critical Properties: A Model-driven Approach," Cemal Yilmaz, Atif M. Memon, Adam Porter, Arvind S. Krishna, Douglas C. Schmidt, Aniruddha Gokhale, Balachandran Natarajan, *IEEE Software: Special Issue on Persistent Software Attributes, IEEE Computer Society Press*, vol. 21, no. 6, pp. 32–40, Nov. 2004. **(refereed)**

28. "A Distributed Continuous Quality Assurance Process to Manage Variability in Performance-intensive Software," Arvind S. Krishna, Douglas C. Schmidt, Atif M. Memon, Adam Porter, Cemal Yilmaz, *Studia Informatica Universalis, Editions SUGER.*, vol. 4, no. 1, pp. 53–72, Jan. 2005. **(refereed)**

29. "Automated Regression Testing for Evolving GUI Software," Atif M. Memon, Adithya Nagarajan†, and Qing Xie†, *Journal of Software Maintenance and Evolution, John Wiley & Sons, Inc.*, vol. 17, no. 1, pp. 27–64, Jan. 2005. **(refereed)**

30. "GUI Testing: Pitfalls and Process," Atif M. Memon, *IEEE Computer, IEEE Computer Society Press*, vol. 35, issue. 5, pp. 87–88, Aug. 2002. **(refereed)**

31. "Hierarchical GUI Test Case Generation Using Automated Planning," Atif M. Memon, Martha E. Pollack and Mary Lou Soffa, *IEEE Transactions on Software Engineering, IEEE Computer Society Press*, vol. 27, no. 2, pp. 144–155, Feb. 2001. **(refereed)**

32. "SEROS - A Self-Routing Optical ATM Switch," Mohsen Guizani and Atif M. Memon, *International Journal of Communication Systems, John Wiley & Sons, Inc.*, vol. 9, no. 2, pp. 115–125, Mar. 1996. **(refereed)**

C. Refereed Conference Proceedings

1. "Pushing the Limits on Automation in GUI Regression Testing," by Zebao Gao, Chunrong Fang, and Atif Memon, in *The Proceedings of the 26th IEEE International Symposium on Software Reliability Engineering* (ISSRE 2015), 2015. **(refereed)**

2. "Build It Break It: Measuring and Comparing Development Security," by Andrew Ruef, Michael Hicks, James Parker, Dave Levin, Atif Memon, Jandelyn Plane, and Piotr Mardziel, in *The Proceedings of the 8th USENIX Conference on Cyber Security Experimentation and Test*, (Berkeley, CA, USA), 2015, pp. 2-2. **(refereed)**

3. "Disqover: Debugging via Code Sequence Covers," by Ethar Elsaka[†]and Atif M. Memon. In *The Proceedings of the Software Reliability Engineering Workshops (ISSREW), 2015 IEEE International Symposium on Software Reliability*, Nov. 2015, pp. 85-92. **(refereed)**

4. "Piecing Together App Behavior from Multiple Artifacts: A Case Study," by Emily Kowalczyk[†], Atif Memon, and Myra B. Cohen, in *The Proceedings of the 26th IEEE International Symposium on Software Reliability Engineering* (ISSRE 2015), 2015. **(refereed)**

5. "Which of My Failures are Real? Using Relevance Ranking to Raise True Failures to the Top," by Zebao Gao[†]and Atif Memon, in *The Proceedings of the Sixth International Workshop on Testing Techniques for Event BasED Software* (TESTBEDS 2015), 2015. **(refereed)**

6. "Extending Manual GUI Testing Beyond Defects by Building Mental Models of Software Behavior," by Emily Kowalczyk and Atif Memon, in *The Proceedings of the Sixth International Workshop on Testing Techniques for Event BasED Software* (TESTBEDS 2015), 2015. **(refereed)**

7. "Making System User Interactive Tests Repeatable: When and What Should we Control?" by Zebao Gao[†], Yalan Liang, Myra B. Cohen. Atif M. Memon, and Zhen Wang, in *The Proceedings of The 37th International Conference on Software Engineering (ICSE 2015)*, 2015. **(refereed)**

8. "Making GUI Testing Practical: Bridging the Gaps," by Pekka Aho, Matiaz Suarez, Atif Memon, and Teemu Kanstrn, in *The Proceedings of The International Conference on Information Technology - New Generations (ITNG 2015)*, 2015. **(refereed)**

9. "Exploiting the Saturation Effect in Automatic Random Testing of Android Applications," by Domenico Amalfitano, Nicola Amatucci, Anna Rita Fasolino, Porfirio Tramontana, Emily Kowalczyk[†], and Atif Memon, in *The Proceedings of the 2nd ACM International Conference on Mobile Software Engineering and Systems (MOBILESoft 2015)*, 2015. **(refereed)**

10. "Definition and Evaluation of Mutation Operators for GUI-level Mutation Analysis," by Rafael A. P. Oliveira, Emil Algroth, Zebao Gao[†], and Atif Memon, in *The Proceedings of the 10th International Workshop on Mutation Analysis (Mutation 2015)*, 2015. **(refereed)**

11. "Conceptualization and Evaluation of Component-based Testing Unified with Visual GUI Testing: an Empirical Study," by Emil Algroth, Zebao Gao[†], Rafael A.P. Oliveira, and Atif Memon, in *The Proceedings of eighth edition of the IEEE International Conference on Software Testing, Verification, and Validation (ICST 2015)*, 2015. **(refereed)**

12. "Build It Break It: Measuring and Comparing Development Security," by Andrew Ruef, Michael Hicks, James Parker, Dave Levin, Atif Memon, Jan Plane, and Piotr Mardziel, in *The Proceedings of the 8th Workshop on Cyber Security Experimentation and Test (CSET 15)*, August 10, 2015, Washington, D.C. **(refereed)**

13. "N-Gram Based User Behavioral Model for Continuous User Authentication," by Leslie Milton[†], Bryan Robbins[†], and Atif Memon, in *Proceedings of the Eighth International Conference on Emerging Security Information, Systems, and Technologies (SECURWARE 2014)*, 2014. **(Best Paper Award) (refereed)**

14. "Scalable System Environment Caching and Sharing for Distributed Virtual Machines," by Teng Long, Ilchul Yoon, Alan Sussman, Adam Porter, and Atif Memon, in *The Proceedings of the High-Performance Grid and Cloud Computing Workshop*, 2014, IEEE Computer Society. **(refereed)**

15. "Enabling Collaborative Testing Across Shared Software Components," by Teng Long, Ilchul Yoon, Atif Memon, Adam Porter, and Alan Sussman, in *The 17th International ACM Sigsoft Symposium on Component-Based Software Engineering*, 2014. **(refereed)**

16. "Android Apps Consistency Scrutinized," by Khalid Alharbi, Sam Blackshear, Emily Kowalczyk, Atif Memon, Bor-Yuh Evan Chang, and Tom Yeh, in *ACM CHI Conference on Human Factors in Computing Systems*, 2014. **(refereed)**

17. "An Extensible Framework to Implement Test Oracle for Non-Testable Programs," by Rafael A.P. Oliveira, Atif Memon, Victor N. Gil, Fatima L.S. Nunes, and Marcio Delamaro, in *The 26th International Conference on Software Engineering and Knowledge Engineering*, 2014. **(refereed)**

18. "Murphy Tools: Utilizing Extracted GUI Models for Industrial Software Testing," Pekka Aho, Matias Suarez, Teemu Kanstren and Atif Memon, 9th Testing: Academic and Industrial Conference - Practice and Research Techniques (TAIC PART), Cleveland, Ohio, USA, 2014. **(refereed)**

19. "Combining Research and Education of Software Testing: A Preliminary Study," Zhenyu Chen, Atif Memon, and Bin Luo, 29th Symposium On Applied Computing (SAC), Gyeongju, Korea 2014. **(refereed)**

20. "A Pattern-Based Approach for GUI Modeling and Testing," by Rodrigo M. L. M. Moreira, Ana C. R. Paiva, and Atif Memon, in Proceedings of the 24th annual International Symposium on Software Reliability Engineering (ISSRE 2013), 2013. **(refereed)**

21. "De novo likelihood-based measures for comparing metagenomic assemblies," by Christopher M Hill, Irina Astrovskaya, Howard Huang, Sergey Koren, Atif Memon, Todd J Treangen, Mihai Pop, in Proceedings of the 2013 IEEE International Conference on Bioinformatics and Biomedicine (BIBM), pp. 94-98, IEEE, 2013. **(refereed)**

22. "The First Decade of GUI Ripping: Extensions, Applications, and Broader Impacts," by Atif Memon, Ishan Banerjee†, Bao Nguyen†, and Bryan Robbins†, In Proceedings of the 20th Working Conference on Reverse Engineering (WCRE), 2013. **(refereed)**

23. "Industrial Adoption of Automatically Extracted GUI Models for Testing," by Pekka Aho, Matias Suarez, Teemu Kanstren. and Atif Memon, in Proceedings of the 3rd International Workshop on Experiences and Empirical Studies in Software Modelling, 2013. **(refereed)**

24. "Automated testing of GUI applications: models, tools, and controlling flakiness," by Atif M. Memon and Myra B. Cohen, *Proceedings of the 2013 International Conference on Software Engineering*, 2013, pp. 1479-1480. **(refereed)**

25. "Using GUI Ripping for Automated Testing of Android Applications," Domenico Amalfitano, Anna Rita Fasolino, Salvatore De Carmine, Atif Memon, and Porfirio Tramontana, *Proceedings of the 27th IEEE international conference on Automated software engineering* (ASE-2012), 2012. **(refereed)**

26. "Testing is an Event-Centric Activity," Fevzi Belli, Mutlu Beyazit, and Atif Memon, *Proceedings of the International Conference on Software Security and Reliability*, 2012. **(refereed)**

27. "Lightweight Static Analysis for GUI Testing," Stephan Arlt, Andreas Podelski, Cristiano Bertolini, Martin Schaf, Ishan Banerjee, and Atif Memon, *Proceedings of the 23rd IEEE International Symposium on Software Reliability Engineering,* (ISSRE-2012), 2012. **(refereed)**

28. "AutoInSpec: Using Missing Test Coverage to Improve Specifications in GUIs," Myra Cohen, Si Huang, and Atif Memon, *Proceedings of the 23rd IEEE International Symposium on Software Reliability Engineering,* (ISSRE-2012), 2012. **(refereed)**

29. "Overlap and Synergy in Testing Software Components Across Loosely-Coupled Communities," Teng Long, Ilchul Yoon, Adam Porter, Alan Sussman, and Atif Memon, *Proceedings of the 23rd IEEE International Symposium on Software Reliability Engineering,* (ISSRE-2012), 2012. **(refereed)**

30. "Towards Incremental Component Compatibility Testing," Il-Chul Yoon, Alan Sussman, Atif Memon, Adam Porter, *Proceedings of the 14th International ACM SIGSOFT Symposium on Component Based Software Engineering (CBSE-2011)*, (Boulder, Colorado), June 21, 2011. **(refereed)**

31. "Using Methods and Measures from Network Analysis for GUI Testing," Ethar Elsaka[†], Walaa Eldin Moustafa, Bao Nguyen, and Atif M. Memon, *Proceedings of the International Workshop on TESTing Techniques and Experimentation Benchmarks for Event-Driven Software (TESTBEDS 2010)*, (Paris, France), 2010. **(refereed)**

32. "Repairing GUI Test Suites Using a Genetic Algorithm," Si Huang, Myra Cohen, and Atif M. Memon, *Proceedings of the 3rd IEEE International Conference on Software Testing, Verification and Validation (ICST 2010)*, (Paris, France), 2010. **(refereed)**

33. "Community-Based, Collaborative Testing and Analysis," Atif Memon, Adam Porter, and Alan Sussman, *Proceedings of the Workshop on the Future of Software Engineering (FSE/SDP 2010)*, (Santa Fe, New Mexico, USA), 2010. **(refereed)**

34. "Repairing GUI Test Suites Using a Genetic Algorithm," Si Huang, Myra Cohen, and Atif M. Memon, *Proceedings of the 3rd IEEE International Conference on Software Testing, Verification and Validation*, (Paris, France), Sep. 20–26, 2009. **(refereed)**

35. "Introducing a Test Suite Similarity Metric for Event Sequence-Based Test Cases," Penelope Brooks,[†]and Atif M. Memon, *Proceedings of the 23rd IEEE International Conference on Software Maintenance*, (Alberta, Canada), Sep. 20–26, 2009. **(refereed)**

36. "Prioritizing Component Compatibility Tests via User Preferences," Il-Chul Yoon, Alan Sussman, Atif M. Memon, and Adam Porter, *Proceedings of the 23rd IEEE International Conference on Software Maintenance*, (Alberta, Canada), Sep. 20–26, 2009. **(refereed)**

37. "An Extensible Heuristic-Based Framework for GUI Test Case Maintenance," Scott McMaster[†]and Atif M. Memon, *TESTBEDS'09: Proceedings of the First International Workshop on TESTing Techniques & Experimentation Benchmarks for Event-Driven Software*, Denver, Colorado, April 4, 2009. **(refereed)**

38. "Towards Dynamic Adaptive Automated Test Generation for Graphical User Interfaces," Xun Yuan,[†]Myra Cohen, and Atif M. Memon, *TESTBEDS'09: Proceedings of the First International Workshop on TESTing Techniques & Experimentation Benchmarks for Event-Driven Software*, Denver, Colorado, April 4, 2009. **(refereed)**

39. "An Initial Characterization of Industrial Graphical User Interface Systems," Penelope Brooks,[†]Brian Robinson and Atif M. Memon, *Proceedings of the 2nd IEEE International Conference on Software Testing, Verification and Validation, (ICST '09)*, Denver, Colorado, April 1–4, 2009. **(refereed)**

40. "Alternating GUI Test Generation and Execution," Xun Yuan[†]and Atif M. Memon, *Proceedings of the IEEE Testing: Academic and Industrial Conference (TAIC PART '08)*, Cumberland Lodge, Windsor, UK, August 29-31, 2008. **(refereed)**

41. "Effective and Scalable Software Compatibility Testing," Il-Chul Yoon, Alan Sussman, Atif M. Memon, and Adam Porter, *Proceedings of the International Symposium on Software Testing and Analysis (ISSTA'08), Seattle, WA, July 20-24 2008.* **(refereed)**

42. "Test Case Generator for GUITAR," Daniel Hackner[†]and Atif M. Memon, *Research Demonstration Track paper at the 30th International Conference on Software Engineering, (ICSE'08), Leipzig, Germany, May 2008* **(refereed)**

43. "Relationships Between Test Suites, Faults, and Fault Detection in GUI Testing," Jaymie Strecker[†]and Atif M. Memon, *Proceedings of the First international conference on Software Testing, Verification, and Validation (ICST'08)*, Lillehammer, Norway, 2008 **(refereed)**

44. "Fault Detection Probability Analysis for Coverage-Based Test Suite Reduction," Scott McMaster[†]and Atif M. Memon, *Proceedings of the 21st IEEE International Conference on Software Maintenance (ICSM'07)*, (Paris, France), 2007. **(refereed)**

45. "Direct-Dependency-based Software Compatibility Testing," Il-Chul Yoon, Alan Sussman, Atif M. Memon, and Adam Porter, *Proceedings of the 22nd IEEE international conference on Automated software engineering,* (Washington, DC, USA), 2007. **(refereed)**

46. "Covering Array Sampling of Input Event Sequences for Automated GUI Testing," Xun Yuan,[†]Myra Cohen, and Atif M. Memon, *Proceedings of the 22nd IEEE international conference on Automated software engineering,* (Washington, DC, USA), 2007. **(refereed)**

47. "Automated GUI Testing Guided by Usage Profiles," Penelope Brooks[†]and Atif M. Memon, *Proceedings of the 22nd IEEE international conference on Automated software engineering,* (Washington, DC, USA), 2007. **(refereed)**

48. "Test Suite Prioritization by Interaction Coverage," Renee C. Bryce and Atif M. Memon, *Proceedings of The Workshop on Domain-Specific Approaches to Software Test Automation (DoSTA 2007); co-located with The 6th joint meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering,* (Dubrovnik, Croatia), Sep. 2007. **(refereed)**

49. "Faults' Context Matters," Jaymie Strecker[†]and Atif M. Memon, *Proceedings of The Fourth International Workshop on Software Quality Assurance (SOQUA '07); co-located with The 6th joint meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering,* (Dubrovnik, Croatia), Sep. 2007. **(refereed)**

50. "Using GUI Run-Time State as Feedback to Generate Test Cases," Xun Yuan[†]and Atif M. Memon, *Proceedings of the 29th International Conference on Software Engineering (ICSE 2007)*, Minneapolis, MN, USA, May 23-25, 2007, pp. 396-405. **(refereed)**

51. "Call Stack Coverage for GUI Test-Suite Reduction," Scott McMaster[†]and Atif M. Memon, *Proceedings of the 17th IEEE International Symposium on Software Reliability Engineering (ISSRE 2006)*, Raleigh, NC, USA, pp. 33–44,Nov. 6-10 2006. **(refereed)**

52. "Studying the Characteristics of a 'Good' GUI Test Suite," Qing Xie[†]and Atif M. Memon, *Proceedings of the 17th IEEE International Symposium on Software Reliability Engineering (ISSRE 2006)*, Raleigh, NC, USA, pp. 159–168, Nov. 6-10 2006. **(refereed)**

53. "Automated Model-based Testing of Community-Driven Open Source GUI Applications," Qing Xie[†]and Atif M. Memon, *Proceedings of the 22nd IEEE International Conference on Software Maintenance (ICSM 2006)*, Philadelphia, PA, USA, pp. 145-154, Sep. 24-27, 2006. **(refereed)**

54. "Rapid 'Crash Testing' for Continuously Evolving GUI-Based Software Applications," Qing Xie[†]and Atif M. Memon, *Proceedings of the 21st IEEE International Conference on Software Maintenance (ICSM 2005)*, Budapest, Hungary, pp. 539–548, Sep. 25-30, 2005. **(refereed)**

55. "Call Stack Coverage for Test Suite Reduction," Scott McMaster[†]and Atif M. Memon, *Proceedings of the 21st IEEE International Conference on Software Maintenance (ICSM 2005)*, Budapest, Hungary, pp. 473–482, Sep. 25-30, 2005. **(refereed)**

56. "Main Effects Screening: A Distributed Continuous Quality Assurance Process for Monitoring Performance Degradation in Evolving Software Systems," Cemal Yilmaz, Arvind Krishna, Atif M. Memon, Adam Porter, Douglas C. Schmidt, Aniruddha Gokhale, and Bala Natarajan, *Proceedings of the 27th ACM/IEEE International Conference on Software Engineering (ICSE 2005)*, St. Louis, MO, USA, pp. 293–302, May 15-21, 2005. **(refereed)**

57. "Evaluating Web Page Reliability across Varied Browsing Environments," Cyntrica Eaton[†]and Atif M. Memon, *Proceedings of the 15th IEEE International Symposium on Software Reliability Engineering (ISSRE 2004)*, Saint-Malo, Bretagne, France, Nov. 2-5, 2004. **(refereed)**

58. "Developing Testing Techniques for Event-Driven Pervasive Computing Applications," Atif M. Memon, *OOPSLA 2004 workshop on Building Software for Pervasive Computing (BSPC 2004)*, Vancouver, BC, Canada, Oct. 25, 2004. **(refereed)**

59. "A Distributed Continuous Quality Assurance Process to Manage Variability in Performance-intensive Software," Arvind S. Krishna, Cemal Yilmaz, Atif M. Memon, Adam Porter, Douglas C. Schmidt, Aniruddha Gokhale, Balachandran Natarajan, *Component And Middleware Performance, OOPSLA 2004 Workshop,* Vancouver Convention & Exhibition Centre, Vancouver, British Columbia, Canada, Oct. 25, 2004. **(refereed)**

60. "Using Transient/Persistent Errors to Develop Automated Test Oracles for Event-driven Software," Atif M. Memon and Qing Xie[†], *Proceedings of the 19th IEEE International Conference on Automated Software Engineering 2004 (ASE 2004)*, Linz, Austria, pp. 186–195, Sep. 20-24, 2004. *Acceptance rate: 14%.* **(refereed)**

61. "Empirical Evaluation of the Fault-detection Effectiveness of Smoke Regression Test Cases for GUI-based Software," Atif M. Memon and Qing Xie[†], *Proceedings of the 20th IEEE International Conference on Software Maintenance 2004 (ICSM 2004)*, Chicago, IL, USA, pp. 8–17, Sep. 11–17, 2004. **(refereed)**

62. "Improving Browsing Environment Compliance Evaluations for Websites," Cyntrica Eaton[†]and Atif M. Memon, *International Workshop on Web Quality (WQ 2004)*, July 27, 2004, Munich, Germany. **(refereed)**

63. "Model-Driven Quality Assurance Techniques for Distributed Real-time and Embedded Systems," Emre Turkay, Arvind S. Krishna, Aniruddha Gokhale, Douglas Schmidt, Bala Natarajan, Adam

Porter, Cemal Yilmaz, Atif M. Memon, *OMG Real-Time & Embedded Systems Workshop,* July 12-15, 2004, Hyatt Regency Reston, Reston, VA, USA. **(refereed)**

64. "Improving Software Quality and Performance using Model-integrated Distributed Continuous Quality Assurance," A. S. Krishna, Douglas C. Schmidt, Atif M. Memon, Adam Porter, D. Sevilla, *Proceedings of the 8th International Conference on Software Reuse (ICSR 2004)*, Madrid, Spain, July 5-9 2004. **(refereed)**

65. "A Model-based Distributed Continuous Quality Assurance Process to Enhance the Quality of Service of Evolving Performance-intensive Software Systems," Cemal Yilmaz, Arvind S. Krishna, Atif M. Memon, Adam Porter, Douglas C. Schmidt, Aniruddha Gokhale and Balachandran Natarajan, *Remote Analysis and Measurement of Software Systems (RAMSS 2004)*, Edinburgh, Scotland, UK, May 2004. **(refereed)**

66. "Distributed Continuous Quality Assurance: Leveraging User Resources to Improve Software Quality Around-the-World, Around-the-Clock," Atif M. Memon, Adam Porter, Cemal Yilmaz, and Adithya Nagarajan†, Douglas C. Schmidt and Bala Natarajan, *Proceedings of the ACM/IEEE International Conference on Software Engineering (ICSE 2004)*, Edinburgh, Scotland, pp. 459–468, May 2004. **(refereed)**

67. "ASPIRE: Automated Systematic Protocol Implementation Robustness Evaluation," Arunchandar Vasan†and Atif M. Memon, *Proceedings (published by the IEEE Computer Society Press) of the Australian Software Engineering Conference (ASWEC 2004),* Melbourne, Australia, pp. 241–250, Apr. 13–16, 2004. **Best paper award. (refereed)**

68. "Using Tasks to Automate Regression Testing of GUIs," Atif M. Memon, *Proceedings of the IASTED International Conference on ARTIFICIAL INTELLIGENCE AND APPLICATIONS (AIA 2004)*, Innsbruck, Austria, pp. 52–155, Feb. 16–18, 2004. **(refereed)**

69. "Refactoring Using Event-Based Profiling," Adithya Nagarajan†and Atif M. Memon, *The First International Workshop on REFactoring: Achievements, Challenges, Effects (REFACE)*, November 13, 2003, British Colombia, Canada. **(refereed)**

70. "GUI Ripping: Reverse Engineering of Graphical User Interfaces for Testing," Atif M. Memon, Ishan Banerjee†, and Adithya Nagarajan†, *Proceedings of the IEEE 10th Working Conference on Reverse Engineering (WCRE 2003)*, Victoria, British Columbia, Canada, pp. 260–269, Nov. 13–16 2003. **(refereed)**

71. "Feedback-driven Design of Distributed Real-time & Embedded Component Middleware Via Model-Integrated Computing & Distributed Continuous Quality Assurance," Atif M. Memon, Adam Porter and Doug Scmidt, *Science of Design: Software-Intensive Systems, A National Science Foundation Invitational Workshop,* November 2-4, 2003, Airlie Center, VA, USA. **(refereed)**

72. "What Test Oracle Should I use for Effective GUI Testing?" Atif M. Memon, Ishan Banerjee†, and Adithya Nagarajan†, *Proceedings of the IEEE International Conference on Automated Software Engineering (ASE 2003),* Montreal, Quebec, Canada, pp. 164–173, Oct. 6–10 2003. **(refereed)**

73. "Regression Testing of GUIs," Atif M. Memon and Mary Lou Soffa, *Proceedings of the 9th ACM/IEEE European Software Engineering Conference (ESEC) and 11th ACM SIGSOFT International Symposium on the Foundations of Software Engineering (FSE-11)*, Helsinki, Finland, pp. 118–127, Sep. 1-5, 2003. **(refereed)**

74. "DART: A Framework for Regression Testing Nightly/Daily Builds of GUI Applications," Atif M. Memon, Ishan Banerjee†, Nada Hashmi†and Adithya Nagarajan†, *Proceedings of the IEEE International Conference on Software Maintenance 2003 (ICSM 2003)*, Amsterdam, The Netherlands, Sep. 22–26, 2003, pp. 410–419. **(refereed)**

75. "Automatically Testing Nightly/Daily Builds of GUI Applications," Atif M. Memon, Ishan Banerjee†, Nada Hashmi†and Adithya Nagarajan†, *Proceedings of the IEEE International Conference on Dependable Systems and Networks (DSN 2003)*, San Francisco, CA, USA, June 22–25, 2003, pp. B-8–B-9. **(refereed)**

76. "Coverage Criteria for GUI Testing," Atif M. Memon, Mary Lou Soffa and Martha E. Pollack, *Proceedings of the 8th European Software Engineering Conference (ESEC) and 9th ACM SIGSOFT International Symposium on the Foundations of Software Engineering (FSE-9)*, Vienna University of Technology, Austria, Sep. 10–14, 2001, pp. 256–267. **(refereed)**

77. "Survivability Performance Evaluation of an Optical Switch," M. Guizani and Atif M. Memon, *Proceedings of the IEEE Global Telecommunications Conference, 2000. (GLOBECOM 2000)*, San Francisco, CA, USA, Nov. 27–Dec. 1, 2000, pp. 1192–1195. **(refereed)**

78. "Automated Test Oracles for GUIs," Atif M. Memon, Martha E. Pollack and Mary Lou Soffa, *Proceedings of the ACM/IEEE Eighth International Symposium on the Foundations of Software Engineering (FSE-8)*, San Diego, CA, USA, Nov. 6–10, 2000, pp. 30–39. **(refereed)**

79. "A Planning-Based Approach to GUI Testing," Atif M. Memon, Martha E. Pollack and Mary Lou Soffa, *Proceedings of the 13th International Software/Internet Quality Week (QW 2000)*, San Francisco, CA, USA, May 30–June 2, 2000. **(refereed)**

80. "Plan Generation for GUI Testing," Atif M. Memon, Martha E. Pollack and Mary Lou Soffa, *Proceedings of the Fifth AAAI International Conference on Artificial Intelligence Planning and Scheduling (AIPS 2000)*, Breckenridge, CO, USA, Apr. 15–17, 2000, pp. 226–235. **(refereed)**

81. "Using a Goal-driven Approach to Generate Test Cases for GUIs," Atif M. Memon, Martha E. Pollack and Mary Lou Soffa, *Proceedings of the 21st ACM/IEEE International Conference on Software Engineering (ICSE 1999)*, Los Angeles, CA, USA, May 16-22, 1999, pp. 257–266. **(refereed)**

82. "Throughput Analysis of a Fault-Tolerant Switch," Atif M. Memon, M. Guizani, and M. Benten, *Proceedings of the 15th IEEE International Phoenix Conference on Computers and Communications (IPCCC 1996)*, Phoenix, AZ, USA, Mar. 27-29, 1996, pp. 206–210. **(refereed)**

83. "Optical Design of a Fault-Tolerant Self-Routing Switch for Massively Parallel Processing Networks," M. Guizani, Atif M. Memon, and S. Ghanta, *Proceedings of the IEEE Second International Conference on Massively Parallel Processing using Optical Interconnections (ICMPP 1995)*, San Antonio, TX, USA, Oct. 22-24, 1995, pp. 246–253. **(refereed)**

84. "An Optical Architecture for Edge Detection," Atif M. Memon, S. Ghanta, and M. Guizani, *Proceedings of the Seventh IASTED International Conference on Parallel and Distributed Computing and Systems*, Georgetown University, Washington D.C., USA, Oct. 18-21, 1995, pp. 459–462. **(refereed)**

85. "Design and Implementation Tools for Optical Architectures," Atif M. Memon, M. Guizani, and S. Ghanta, *Proceedings of the Fourth Saudi Engineering Conference*, Jeddah, Saudi Arabia, Nov. 5-8, 1995, pp. 437–442. **(refereed)**

86. "A Functional Approach for Simulation of Optical Architectures," Atif M. Memon, M. Guizani, and S. Ghanta, *Proceedings of the First LAAS International Conference on Computer Simulation*, Beirut, Lebanon, Sep 1-4, 1995, pp. 175–181. **(refereed)**

87. "Thinning of Arabic Text," Atif M. Memon and S. Faizullah, *Proceedings of the 9th International Symposium on Computer and Information Sciences (ISCIS IX)*, Antalya, Turkey, Nov, 1994, pp. 689–696. **(refereed)**

88. "ZERAK : A Neural Network Model for Arabic Characters Recognition," S. Faizullah and Atif M. Memon, *Proceedings of the 9th International Symposium on Computer and Information Sciences (ISCIS IX)*, Antalya, Turkey, Nov, 1994, pp. 501–507. **(refereed)**

D. Conferences, Workshops, and Talks

i. Keynote Speeches

1. "Acknowledging the Elephant in the Room: Brittle Test Cases," Keynote address at Regression 2012, Montreal, April 17, 2012.

ii. Invited Talks

- Test Automation at Scale: Challenges and Solutions, Netflix, Los Gatos, CA, 2017.
- Role of Flaky Tests in Continuous Integration, Google, Sunnyvale, CA, 2016.
- Recent Advances in Software Testing, Apple, Sunnyvale, CA, 2016.
- Model-Based Dynamic Analysis: Pushing the Envelope on Automated Software Quality Assurance, Google, Mountain View, CA, 2015.
- Model-Based Dynamic Analysis: Pushing the Envelope on Automated Software Quality Assurance, Yahoo Labs, Palo Alto, CA, 2015.
- Situation-Driven Testing, IEEE International Conference on Software Testing, Verification and Validation (ICST 2015 - Grand Challenge Panel).
- Model-Based Dynamic Analysis: Pushing the Envelope on Automated Software Quality Assurance, Electrical and Computer Engineering Department at the University of Miami, 2015.
- The First Decade of GUI Ripping: Extensions, Applications, and Broader Impacts, Department of Computer Science, Stanford University, 2014.
- Implementing Continuous Integration and Testing Issues, Challenges and Solutions, McGraw Hill Financial Services, 2014.
- The First Decade of GUI Ripping: Extensions, Applications, and Broader Impacts, Department of Computer Science, Virginia Tech, 2014.
- The First Decade of GUI Ripping: Extensions, Applications, and Broader Impacts, Department of Computer Science, Groupon, Inc., 2014.

- The First Decade of GUI Ripping: Extensions, Applications, and Broader Impacts, Department of Computer Science, University of Miami, 2014.
- The First Decade of GUI Ripping: Extensions, Applications, and Broader Impacts, as part of receiving the "retrospective" award for the most influential paper among the papers of 2003 Working Conference on Reverse Engineering, Kublenz, Germany, 2013.
- GUITAR: Kick-starting model-based test automation for User Interactive Event Driven Software, VMware Inc., Palo Alto, CA, USA, May 22, 2013.
- Automated Testing of GUI Applications: Models, Tools, and Controlling Flakiness, Apple Inc., Cupertino, CA, USA, May 21, 2013.
- COMET: A Web Infrastructure for Research and Experimentation in User Interactive Event Driven Testing, Software Institute, Nanjing University, Nanjing, Dec. 20, 2012.
- COMET: A Web Infrastructure for Research and Experimentation in User Interactive Event Driven Testing, National Institute of Advanced Industrial Science and Technology (AIST), Dec. 17, 2012.
- COMET: A Web Infrastructure for Research and Experimentation in User Interactive Event Driven Testing, Department of Informatics Engineering Faculty of Engineering University of Porto, Dec. 13, 2012.
- Which Test Oracle Should I Use for Effective GUI Testing?, The 20th CREST Open Workshop entitled "The Oracle Problem for Automated Software Testing", May 22, 2012.
- Acknowledging the Elephant in the Room: Brittle Test Cases, keynote address at Regression 2012, Montreal, April 17, 2012.
- Adaptive Test-Case Generation for Event-Driven Software Applications, University of Lugano, Switzerland, Sep. 30, 2011.
- Adaptive Test-Case Generation for Event-Driven Software Applications, IBM Thomas J. Watson Research Center, Nov. 9, 2009.
- Automated Model-Based Testing of Event-driven Software Applications, Tata Consultancy Services, (TCS), Channai, India, Dec. 16, 2009.
- Automated Model-Based Testing of Event-driven Software Applications, Tata Research Development and Design Centre (TRDDC), Pune, India, Nov. 6, 2009.
- Automated Model-Based Testing of Event-driven Software Applications, Institute of Software, Chinese Academy of Sciences (ISCAS), China, Sep. 24, 2008.
- Software Quality and GUITAR, Sichuan University in Chengdu, China, Sep. 11, 2008.
- Automated Model-Based Testing of Event-driven Software Applications, Sichuan University in Chengdu, China, Sep. 11, 2008.
- Automated Model-Based Testing of Event-driven Software Applications, IEEE Computer Society of Pakistan, June 24, 2008.
- National University of Emerging and Computing Sciences, "New Trends in Software Testing," June 21, 2008.

- Information Technology Laboratory (ITL) seminar on "Testing Event-Driven Systems" at the National Institute of Standards & Technology, Mar. 5, 2008.
- Google Test Automation Conference, Aug. 23–24, 2007.
- Automated Model-Based Testing of Event-driven Software Applications, Accenture Technology Labs, Chicago, May 11, 2007.
- Testing Event-driven Software Applications – Issues, Challenges, and Solutions, IEEE Computer Society – Kitchener-Waterloo Chapter and the Department of Electrical and Computer Engineering, University of Waterloo, Mar. 17, 2006.
- Testing Event-driven Software, Department of Computer Science, Drexel University, Feb. 11, 2005.
- Enhancing Testing Techniques for Event-driven Software Applications, 2004 University of Washington and Microsoft Research Summer Institute, Trends in Testing: Theory, Techniques and Tools, Aug. 22-26, 2004.
- Event-driven Software Testing, NASA Goddard Space Flight Center (GSFC), in the Technology Education & Assessment Seminars (TEAS) series, July 13, 2004.
- Techniques and Tools for Testing Event-Driven Software, TECH 2004, Mar. 19, 2004.
- Testing Event-driven Software, Microsoft Research, Mar. 12, 2004.
- Testing Event-driven Software, Reliability Engineering Department, University of Maryland, Mar. 4, 2004.
- Testing Event-driven Software, Department of Information and Software Engineering, George Mason University, Mar. 3, 2004.
- Testing Event-driven Software, Fraunhofer IESE, Kaiserslautern, Germany, Feb. 19, 2004.
- Software Quality and GUITAR, National Institutes of Health, Dec. 1, 2003.
- Event-based Software Testing, Avaya Labs Research, June 12, 2003.
- Event-based Software Testing, Titan Corporation, May 14, 2003.
- Testing Graphical User Interface Software, NASA Goddard Tech Summit, Apr. 23, 2002.
- A Comprehensive Framework for Testing Graphical User Interfaces, National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, Jan. 8, 2002.
- A Comprehensive Framework for Testing Graphical User Interfaces, IBM Thomas J. Watson Research Center, Jan. 22, 2001.
- A Comprehensive Framework for Testing Graphical User Interfaces, Department of Computer and Information Science, Ohio State University, Feb. 8, 2001.
- A Comprehensive Framework for Testing Graphical User Interfaces, Department of Computer and Information Sciences, University of Delaware, Feb. 20, 2001.
- A Comprehensive Framework for Testing Graphical User Interfaces, Lucent Technologies, Columbus, Feb. 23, 2001.

- A Comprehensive Framework for Testing Graphical User Interfaces, Department of Computer Science, University of Maryland, Feb. 28, 2001.
- A Comprehensive Framework for Testing Graphical User Interfaces, Department of Computer Science and Engineering, Pennsylvania State University, Mar. 20, 2001.
- A Comprehensive Framework for Testing Graphical User Interfaces, Department of Electrical and Computer Engineering, University of Texas at Austin, Mar. 27, 2001.
- A Comprehensive Framework for Testing Graphical User Interfaces, College of Computing, Georgia Institute of Technology, Apr. 2, 2001.
- A Comprehensive Framework for Testing Graphical User Interfaces, Department of Information and Computer Science, University of California, Irvine, Apr. 9, 2001.
- A Comprehensive Framework for Testing Graphical User Interfaces, Department of Computer Science, University of Southern California, Los Angeles, Apr. 10, 2001.
- Coverage Criteria for GUI Testing, Fraunhofer Center for Experimental Software Engineering, College Park, Maryland, Sep. 17, 2001.

†Indicates a student advised, co-advised, or directly supervised by Dr. Memon.

iii. Refereed Posters

- Capture/Replay Tool For Testing GUIs, Research Review Day, University of Maryland, Mar. 21, 2003.
- GUITAR - Graphical User Interface Testing Framework, Research Review Day, University of Maryland, Mar. 21, 2003.
- DART: Daily Automated Regression Tester, Research Review Day, University of Maryland, Mar. 21, 2003.
- GUI Ripper: A Tool to Extract GUI Widgets and Windows, Research Review Day, University of Maryland, Mar. 21, 2003.
- Structural Representations of GUI Events for Testing and Analysis, Research Review Day, University of Maryland, Mar. 1, 2002.
- A Planning-Based Approach to Testing GUIs, Research Review Day, University of Maryland, Mar. 1, 2002.
- Automated Test Oracles for GUIs, Research Review Day, University of Maryland, Mar. 1, 2002.
- Determining the Adequacy of GUI Test Cases, Research Review Day, University of Maryland, Mar. 1, 2002.
- A comprehensive framework for GUI testing, Research Review Day, University of Pittsburgh, Dec. 15, 2000.

E. Professional Publications

1. "A Comprehensive Framework for Testing Graphical User Interfaces," Atif M. Memon, *Ph.D. Dissertation, Department of Computer Science, University of Pittsburgh, July, 2001.*

2. "Comparing Causal-Link and Propositional Planners: Tradeoffs between Plan Length and Domain Size," Atif M. Memon, Martha E. Pollack and Mary Lou Soffa, *Technical Report TR-99-06, Dept. of Computer Science, University of Pittsburgh, Pittsburgh, Feb. 1999.*

3. "A System for Prototyping Optical Architectures," Atif M. Memon, *A Thesis Presented to the Faculty of College of Graduate Studies, Department of Information and Computer Science, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, Dec. 20, 1995.*

4. "Mathematica: for Engineers, Scientists, and Educators ," Atif M. Memon and S. Ghanta, *Newsletter of the Information Technology Center, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia*, 1994.

F. Completed Creative Works

i. Software and Applications

- **GUITAR**: Software testing is a critical component of the software development process and is required to ensure the safety, robustness and usability of software. Unfortunately, it is also complex, labor intensive and expensive, accounting for almost 67% of the total cost of software development. Hence, there has been significant research aimed at automating the testing process. Although automation has achieved some success, many problems remain. In particular, it is not yet clear how to automate the testing of graphical user interfaces (GUIs), which constitute an increasingly large portion of software systems (almost 50% of the total software code). The focus of my research is automated model-based testing of event-driven software; GUIs constitute one of the most popular sub-class of event-driven software. Most of the new techniques that I have developed for GUI testing have been implemented in a downloadable software called GUITAR.

  GUITAR has been downloaded by over 25000 users from all over the world, mostly from software development companies. Some of the features that make GUITAR usable are a help menu, a bug database powered by Bugzilla, user manuals, and FAQs. I have given seminars on GUITAR at numerous locations including NASA Goddard Space Flight Center (`aaaprod.gsfc.nasa.gov/teas`), Microsoft Research (`research.microsoft.com`), The National Institutes of Health (`www.nih.gov`), Fraunhofer Center for Experimental Software Engineering (`fc-md.umd.edu`), The Titan Corporation (`www.titan.com`), Avaya Labs Research (`www.avaya.com`), and Hughes Network Systems (`www.hns.com`). It was recently exhibited at CeBIT (`www.cebit-america.com`), a huge marketplace for software vendors and exhibitors.

  Users of GUITAR regularly report bugs via a bug database, maintained at `bugs.cs.umd.edu`. The GUITAR web-site serves as a discussion group; users are constantly informed of updates via a mailing list. Numerous practitioners have provided short-cuts to the GUITAR web-site through their own sites. Two popular examples include **Software QA Testing and Test Tool Resources** (www.aptest.com/resources.html) and **DACS - Data & Analysis Center for Software - DACS - Software** (www.dacs.dtic.mil/databases/url/key.php?keycode=3494:3500).

- **ICE:** In order to preserve the effectiveness of the World Wide Web (WWW) as a communication medium, web developers must have a keen understanding of how pages within their website are rendered to the diversely equipped Web audience. More specifically, since users explore the WWW with a wide variety of browser, browser version, and platform configurations, the display of individual web pages can be significantly different based on the actual browsing environment. Such differences can essentially threaten the ability for pages to be displayed and to function as the author intended resulting in documents with missing elements, improper text alignments, and malfunctioning scripts.

  Given that web page rendering is largely based on the tags that are contained within the HTML source code for the document and the relative support for a tag within a browsing environment, our approach to identifying page-to-browser compliancy issues is to scan the document source for the presence of tags known to be unsupported within specific browser/version/platform environments. As a result of our work, we have created a tool, the Internet Compliance Evaluator (ICE), that will evaluate compliancy for an entire website based on both predefined and, when necessary, user-specified sets of rules that specify the tags that are unsupported within specific environments. The ability of the tool to accept user-defined rules allows it to be much more flexible than current page-browser compliancy tools and, subsequently, more equipped to deal with newer compliancy rules as they evolve.

- **TerpOffice:** One of the biggest problems with software testing research is the unavailability of standard "benchmarks" for experimentation and evaluation of new testing techniques. To alleviate this problem, I have developed an OpenSource office suite software called TerpOffice for evaluation of new GUI testing techniques. TerpOffice is being used by numerous researchers for their experiments. For example, Amir Michail and Tao Xie recently used TerpOffice for their experiments reported in a paper entitled "Helping Users Avoid Bugs in GUI Applications," published in the Proceedings of the 27th International Conference on Software Engineering (ICSE 2005), St. Louis, Missouri, USA, pp. 107-116, May 2005.

  To enable maximum dissemination, extra meta and derived information is also maintained as shared artifacts. These shared artifacts have evolved as demanded by researchers. For example, some researchers wanted to use only the source code; other more advanced researchers, wanted to have access to the software's requirement and design documents to make changes to it; yet others wanted to replicate experiments by using my fault-seeded versions of the software subjects. Consequently, I have made available requirements and design documents, source code, documents describing what the software does, how to use and modify it, development and evolution artifacts such as bug reports, results of experiments, derived artifacts such as event-flow graphs, test cases and tools such as test-case re-players, and fault-seeded versions of the code.

- **OpticalCAD** is a system that I developed during my MS Thesis for prototyping optical architectures. Users of OpticalCAD can describe an optical architecture setup involving optical components (such as lenses, holograms, mirrors, lasers) in an Optical Hardware Description Language (OHDL) that I developed. OpticalCAD carries out discrete event simulation of the optical architecture and reports problems (such as stray laser beams) and output.

G. Sponsored Research

i. Grants

- **TITLE:** "Vetting Android Applications for Security Using Graphical User Interface Logic"
  RECEIPIENT INSTITUTION: *UMIACS*
  FUNDING AGENCY: *US Defense Advanced Research Projects Agency (DARPA)*
  AMOUNT: $733,734
  DATES: Aug. 1, 2013 – Dec. 31, 2015
  ROLE: PI.

- **TITLE:** "EDU: Competing to Build Secure Systems"
  RECEIPIENT INSTITUTION: *Computer Science Department*
  FUNDING AGENCY: *National Science Foundation*
  AMOUNT: $300,000
  DATES: Sep. 1, 2013 – Aug 31, 2015
  ROLE: co-PI.

- **TITLE:** "Research in Science and Public Policy for the U.S. National Security Agency"
  RECEIPIENT INSTITUTION: *Physics Department*
  FUNDING AGENCY: *National Security Agency*
  AMOUNT: $100,000
  DATES: July 15, 2013
  ROLE: co-Instructor.

- **TITLE:** "Algorithms and Software for the Assembly of Metagenomic Data"
  RECEIPIENT INSTITUTION: *UMIACS*
  FUNDING AGENCY: *National Institutes of Health*
  AMOUNT: $1,675,112
  DATES: Mar. 21, 2013 – Feb. 28, 2017
  ROLE: co-Principal Investigator.

- **TITLE:** "II-NEW: Collaborative Research: COMET: A Web Infrastructure for Research and Experimentation in User Interactive Event Driven Testing "
  RECEIPIENT INSTITUTION: *CS Department*
  FUNDING AGENCY: *National Science Foundation*
  AMOUNT: $367,896
  DATES: August 1, 2012 – July 31, 2015
  ROLE: Principal Investigator.

- **TITLE:** " II-NEW: Collaborative Research: COMET-COMmunity Event-based Testing"
  RECEIPIENT INSTITUTION: *CS Department*
  FUNDING AGENCY: *National Science Foundation*
  AMOUNT: $100,000
  DATES: August 8, 2009 – July 31, 2012
  ROLE: Principal Investigator.

- **TITLE:** "Evaluating the Software Engineering Process at OIT"
  RECEIPIENT INSTITUTION: *MINDLAB-UMIACS*
  FUNDING AGENCY: *Office of Information Technology*

AMOUNT: $25,000
DATES: June 1, 2005
ROLE: PI.

- **TITLE:** " A Testbed for Assuring the Quality of DoD Combat"
  RECEIPIENT INSTITUTION: *CS Department*
  FUNDING AGENCY: *DOD - Navy.ONR*
  AMOUNT: $206,000
  DATES: May 1, 2005 (1 year)
  ROLE: Co-PI with Adam Porter.

- **TITLE:** "CAREER AWARD: Enhancing Testing Techniques for Event-driven Software"
  RECEIPIENT INSTITUTION: *CS Department*
  FUNDING AGENCY: *National Science Foundation*
  AMOUNT: $400,000
  DATES: Feb. 15, 2005 – July 31, 2011
  ROLE: Principal Investigator.

- **TITLE:** "One-day Workshop on Introduction to Software Testing"
  RECEIPIENT INSTITUTION: *UMIACS*
  FUNDING AGENCY: *Hughes Network Systems*
  AMOUNT: $10,000
  DATES: June 20, 2003
  ROLE: Instructor.

- **TITLE:** "A GUI Testing Framework in Agile Software Development Methods"
  RECEIPIENT INSTITUTION: *Fraunhofer Center for Experimental Software Engineering*
  FUNDING AGENCY: *Fraunhofer USA, Inc and Fraunhofer Center for Experimental Software Engineering*
  AMOUNT: $80,562 (Fraunhofer USA, Inc) plus $21,450 (Fraunhofer Center for Experimental Software Engineering)
  DATES: May 1, 2002 – Apr. 30, 2003
  ROLE: Scientist.

III. Teaching, Mentoring, and Advising

A. Courses Taught

Semester	Course	# Students	Description
Fall, 2014	CMSC 436	60	Programming Handheld Systems
Fall, 2014	CMSC 396H	21	Honors Seminar
Fall, 2014	CMSC 737	14	Fundamentals of Software Testing
Fall, 2014	HONR 378N	11	Advanced Honors Seminar; Research in Science and Public Policy for the U.S. National Security Agency
Spring, 2014	BUDT 758L	22	Special Topics in Decision, Operations and Information Technologies; Mobile App Development
Spring, 2014	ENPM 808B	8	Advanced Topics in Engineering; Secure Operating Systems
Spring, 2014	CMSC 435	40	Software Engineering
Fall, 2013	ENPM 808K	8	Advanced Topics in Engineering; Secure Software Testing and Construction
Fall, 2013	HONR 378N	11	Advanced Honors Seminar; Research in Science and Public Policy for the U.S. National Security Agency
Fall, 2013	CMSC 737	20	Fundamentals of Software Testing
Fall, 2013	CMSC 396H	23	Honors Seminar
Summer, 2013	CMSC 435	24	Software Engineering
Spring, 2013	CMSC 436	50	Programming Handheld Systems
Spring, 2013	CMSC 435	40	Software Engineering
Fall, 2012	CMSC 737	7	Fundamentals of Software Testing
Spring, 2012	CMSC 435	48	Software Engineering
Fall, 2011	CMSC 737	19	Fundamentals of Software Testing
Spring, 2011	CMSC 435	42	Software Engineering
Fall, 2010	CMSC 737	17	Fundamentals of Software Testing
Spring, 2010	CMSC 435	36	Software Engineering
Fall, 2009	CMSC 737	20	Fundamentals of Software Testing
Spring, 2008	CMSC 737	19	Fundamentals of Software Testing
Fall, 2007	CMSC 330 (Sec. 02**)	41	Organization of Programming Languages
Fall, 2007	CMSC 330 (Sec. 01**)	34	Organization of Programming Languages
Spring, 2007	CMSC 433	42	Programming Language Technologies and Paradigms
Fall, 2006	CMSC 737	10	Fundamentals of Software Testing
Spring, 2006	CMSC 435	15	Software Engineering
Fall, 2005	CMSC 838M	4	Advanced Concepts in Software Testing
Spring, 2005	CMSC 435	38	Software Engineering
Fall, 2004	CMSC 838M	6	Advanced Concepts in Software Testing
Spring, 2004	CMSC 435	38	Software Engineering
Fall, 2003	CMSC 838M	8	Advanced Concepts in Software Testing
Spring, 2003	CMSC 435	42	Software Engineering
Fall, 2002	CMSC 838M	15	Advanced Concepts in Software Testing
Spring, 2002	CMSC 435	50	Software Engineering
Fall, 2001	CMSC 838M	19	Advanced Concepts in Software Testing

Independent Study

Semester	Course	# Students	Description
Spring, 2012	CMSC 499A	1	Independent Undergraduate Research
Summer, 2011	CMSC 499A	1	Independent Undergraduate Research
Spring, 2011	CMSC 499A	1	Independent Undergraduate Research
Fall, 2010	CMSC 798	1	Graduate Seminar Computer Science
Fall, 2010	CMSC 499A	3	Independent Undergraduate Research
Spring, 2010	CMSC 798	1	Graduate Seminar Computer Science
Fall, 2009	CMSC 798	1	Graduate Seminar Computer Science
Fall, 2009	CMSC 499A	1	Independent Undergraduate Research
Spring, 2008	CMSC 499A	1	Independent Undergraduate Research
Spring, 2008	CMSC 498A	1	Research and Learning
Fall, 2003	CMSC 498A	9	Research and Learning

B. Courses or Curriculum Development

i. ENPM 808K – Secure Software Testing and Construction

- This course provides a holistic perspective of software security that spans the entire software lifecycle – from construction to analysis to maintenance. This is because producing secure software is a multifaceted problem of software engineering, security engineering, and management. Producing secure software starts with sound software engineering practices, augmented with sound technical practices, and supported by processes that promote secure software. After a short introduction to secure software thread, the course dives into content that is interwoven with 4 threads that cover theory as well as practice: Mechanisms for construction of secure software, Analysis of software for security, Software engineering processes that support secure software development, and Two practical case studies of unix/linux and the Android mobile platform in which we discuss the mechanisms that these environments provide, and how programmers and testers may leverage these mechanisms for secure software development and analysis.

  More specifically, the course studies the following topics: Programming language features that provide explicit mechanisms, which programmers may use to build security into their programs; including type safety, memory safety, language-based security abstractions, stack-inspection, and sandboxing. Secure design patterns: architectural-level patterns such as distrustful decomposition, privilege separation, and defer to kernel; design-level patterns such as secure factory, secure strategy factory, secure builder factory, secure chain of responsibility, secure state machine, and secure visitor; implementation-level patterns such as secure logger, clear sensitive information, secure directory, pathname canonicalization, input validation, and resource acquisition is initialization. Classification scheme for software security patterns. Architecture and design considerations for secure software. Software engineering for secure systems, processes to produce secure software, secure software development practices. Design validation for security, architectural risk analysis of software systems based on security patterns. Threat modeling and attack patterns. Linux/unix security model and features. Android development, android security overview, permissions, security architecture, application signing, user ids and file access, intents and intent filters, testing android applications, androidmanifest.xml file.

ii. ENPM 808B – Secure Operating Systems

- This course presents at least three perspectives relevant to secure operating systems: (1) operating system designer, (2) programmer, who develops code that run on the operating system base, and (3) end-user, who simply uses the operating system and applications. The operating system designer creates and implements the security model that the operating system provides; the programmer uses the security model to develop software applications that rely on the implementation to provide security; the end-user expects the operating system and applications to work together seamlessly, providing a reasonable level of security.

  After a short introduction to OS thread, the course dives into content that is interwoven with 4 threads that cover theory as well as practice: (1) kernel and core modules of an operating system, (2) security aspects of the kernel and relevant core modules, (3) how attackers think, and (4) two practical case studies of Unix/Linux and the Android mobile platform which discuss the mechanisms these OSes provide, and how programmers may leverage these mechanisms for secure software development and analysis.

iii. CMSC433 – Programming Language Technologies and Paradigm

- Traditionally this course has discussed advanced object-oriented programming concepts, restricted to the Java programming language. This course examines different programming paradigms – Object-oriented programming (OOP), logic programming, and functional programming. Due to its popularity, the OOP paradigm is discussed in detail, focusing on existing and emergining technologies used to implement object-oriented programs. Examples include UML, Design Patterns, Aspect-oriented Programming (AOP), refactoring, JUnit, and JavaDoc. The OOP paradigm can be significantly inefficient in certain domains and applications; some of these applications are examined and alternative paradigms like logic programming and functional programming studied. By the end of this course, students are familiar with the state-of-the-art in programming paradigms and associated technologies.

iv. CMSC435 – Software Engineering

- Traditionally, the software engineering course has been taught with a practical component in which the students had to implement a project using software engineering principles. I have made significant modifications to the course by adding many lectures on software testing and revising the course project. The entire class represents a company (named TerpSoft) developing an office suite called TerpOffice. The first phase of the project requires the students to perform extensive regression testing of the existing version of TerpOffice. They then build a new version in subsequent phases and finally test it in the last phase of the project. The class is divided into groups, each working on a relatively independent part of TerpOffice (TerpManager, TerpDraw, TerpWord, TerpPresent, TerpSpreadSheet, and TerpPaint). Each group is further divided into the coding and testing team, with the project manager serving on the testing team. The students use testing tools to create thousands of test cases; they instrument the software's code and compute statement and branch coverage; they report all bugs using Buzilla (`bugs.cs.umd.edu`) and document their code using JavaDoc. CMSC435 has now become an extremely popular course since students are excited to learn new tools that they have never used before and are likely to use in the future.

v. CMSC838M – Advanced Topics in Software Testing

- I have developed (and taught five times) a new course that examines advanced software testing techniques. In particular, the important phases of testing are reviewed, emphasizing on the significance of each phase when testing different types of software. Students learn the state of the art in testing technology for object-oriented, component-based, concurrent, distributed, graphical-user interface, and web software. In addition, closely related concepts such as model checking and program analysis are also studied. Emerging concepts such as test-case prioritization and their impact on testing are examined. Students gain hands-on testing/analysis experience by proposing new solutions to open research problems in the field of software testing and experimentally demonstrate the strengths/weaknesses of their solutions.

vi. CMSC737 – Fundamentals of Software Testing

- I have also developed a new course that examines the fundamental concepts in software testing. In particular, the important phases of testing are reviewed, emphasizing on the significance of each phase when testing different types of software. Students gain hands-on testing/analysis experience by using popular testing tools and creating test cases for several types of software.

vii. Other Universities

- Lecturer at the King Fahd University (1995-1996) Taught the undergraduate data structures course independently. Also team-taught an introductory computer science course.
- Lecturer at the University of Karachi (1992-1993) Taught the undergraduate data structures course, with programming projects. Also taught labs for the digital computer logic course, which involved setting up a digital logic lab for conducting experiments.

C. Advising: Research Direction

i. Undergraduate

- Fan Wu, (Spring 2014, Independent Study)
- Emily Kowalczyk, (Fall 2013 - Fall 2014, Honors project)
- Ian Sweet, (Fall 2013 - Spring 2014, Independent study)
- Jonathan Tseng, (Fall 2013 - Spring 2014, Independent study)
- Gunnar Bell, (Fall 2012, Independent undergraduate research)
- Corey Lowman, (Fall 2012, Independent undergraduate research)
- Rohan Pathare, (Fall 2012, Independent undergraduate research)
- Whitney Ford, (Spring 2012; Independent undergraduate research while taking my Software Engineering Course CMSC435)

- Temidayo Adebanjo Obayomi, (Summer 2011; Independent undergraduate research after taking my Software Engineering Course CMSC435)
- Tiffany Chao, (Spring 2011; Honor's Project)
- Abeyu Mengistu, (summer 2010; via the University of Maryland A. James Clark School of Engineering and College of Computer, Mathematical, and Physical Science Louis Stokes Alliance for Minority (LSAMP) Undergraduate Research Program)
- Matteo Bellistri, (summer 2010; via the University of Maryland A. James Clark School of Engineering and College of Computer, Mathematical, and Physical Science Louis Stokes Alliance for Minority (LSAMP) Undergraduate Research Program)
- Dixie Kee, (summer 2010; via the Univ. of Maryland Computer Security Scholars Faculty Mentor program)
- Luxi Wang, (summer 2010; via the Univ. of Maryland Computer Security Scholars Faculty Mentor program)
- Radhika Agrawal, (summer 2010; via the Univ. of Maryland Computer Security Scholars Faculty Mentor program)
- Chuqiao (Chole) Wang (2009; via the undergraduate research assistant program)
- Justin Bare (2009; via the undergraduate research assistant program)
- Chris Ventura (2009; via the undergraduate research assistant program)
- Amoona Albadawi (2009; via the undergraduate research assistant program)
- Janelle Gray (Univ. of Vermont) (summer 2009; via the Univ. of Maryland Computer Security Scholars Faculty Mentor program)
- Catherine Theuer (Cornell Univ.) (summer 2009; via the Univ. of Maryland Computer Security Scholars Faculty Mentor program)
- Adil Bukhari (2009; via the undergraduate research assistant program)
- Chong Kok Hoong (2009; via the undergraduate research assistant program)
- Oluwaseun Akinmade (2008; Independent study)
- Sean Spencer (2008; Independent study after taking my Organization of Programming Languages (CMSC330) course)
- Adesh Francis (2007; Independent study after taking my Programming Language Technologies and Paradigms (CMSC433) course)
- Daniel Hackner (2007; Independent study after taking my Programming Language Technologies and Paradigms (CMSC433) course)
- Timophey Zaitsev (2007; Independent study after taking my Programming Language Technologies and Paradigms (CMSC433) course)
- Alexei Ivanov (2004; Independent study after taking my Software Engineering Course CMSC435)

- Chihiro Hirai (2004; via the Undergraduate Research Assistant Program (URAP - http://www.ugresearch.umd.e
- Lai Ho (2003; via the Undergraduate Research Assistant Program)
- Zhou Luoyan (2003; via the Undergraduate Research Assistant Program)
- April Ahn (2003; via the Undergraduate Research Assistant Program)
- Serey Lay (2003; Independent study after taking my Software Engineering Course CMSC435)
- Eric L. Liu (2003; Independent study after taking my Software Engineering Course CMSC435)
- Devmann Lee (2003; Independent study after taking my Software Engineering Course CMSC435)
- Gilad Suberri (2002; via the Undergraduate Research Assistant Program)
- Richard Dill (2002; Independent study after taking my Software Engineering Course CMSC435)
- Divya Ravi (2002; via the Undergraduate Research Assistant Program)
- Won Sun Ouh (2002; Independent study after taking my Software Engineering Course CMSC435)
- Sureshmi Dilushika Wijewardena (2002; via the Undergraduate Research Assistant Program)

ii. Master's

- Shashvat Thakor, 2008.
- Cyntrica Eaton, Spring 2004. Continued on as a PhD student.
- Scott McMaster, Spring 2004. Continued on as a PhD student.
- Ishan Banerjee, August 2003. Worked at AskJeeves.com; Currently at VMWare.
- Adithya Nagarajan, August 2003. Currently Senior Engineering Manager, Search Technology Center (BING) at Microsoft Corporation.

iii. Doctoral

- Ritu Pandey (Current; co-supervisor with Professor Aditya Shastri, Banasthali University, Rajasthan - 304022, INDIA)
- Jose Pedro Tavares (Current; co-supervisor with Professor Ana Paiva in FEUP/DEI, Rua Dr. Roberto Frias, 378, 4200-465 Porto, PORTUGAL)
- Rodrigo Moreira (Current; co-supervisor with Professor Ana Paiva in FEUP/DEI, Rua Dr. Roberto Frias, 378, 4200-465 Porto, PORTUGAL)
- Ins Coimbra Morgado (Current; co-supervisor with Professor Ana Paiva in FEUP/DEI, Rua Dr. Roberto Frias, 378, 4200-465 Porto, PORTUGAL)
- Zebao Gao (Current)

- Emily Kowalczyk (Current)
- Bao Nguyen (graduated in Fall 2013; now at Google)
- Ishan Banerjee (graduated in Spring 2016; now at VMWare)
- Ethar Elsaka (graduated in Spring 2016; now at Apple)
- Leslie Milton (graduated in Spring 2016; now at US Army)
- Bryan Ta (graduated in Spring 2015; now at Microsoft)
- Bryan Robbins (graduated in Spring 2016; now at FINRA)
- Penelope Brookes (graduated in Summer 2009; Project Manager at Raytheon).
- Jaymie Strecker (graduated in Summer 2009; Visiting Assistant Professor at the College of Wooster, Ohio; Systems Developer at the Ohio State University; Software Developer at Kosada).
- Xun Yuan (graduated in Summer 2008; Software Engineer in Test at Google).
- Scott McMaster (graduated in Spring 2008; Software Engineer at Google).
- Cyntrica Eaton (graduated in Fall 2007; Assistant Professor at Norfolk State University).
- Qing Xie (graduated August 25, 2006; Researcher at Accenture Technology Labs).

D. Advising (Other than Research Direction)

i. Graduate (Ph.D. Committee)

Chanhyun Kang, current (VS Subrahmanian, advisor).

Steffen Herbold, graduated in 2012 (Prof. Dr. Jens Grabowski, Georg-August-Universitat Gottingen, advisor).

Timur Chabuk, current (Jim Reggia, advisor).

Alex Quinn, current (Ben Bederson, advisor).

Neha Gupta, current (Ashok Agrawala, advisor).

Shivsubramani Krishnamoorthy, graduated in 2013 (Ashok Agrawala, advisor).

Michael Lam, current (Jeff Hollingsworth, advisor).

Walaa Eldin Moustafa, current (Amol Deshpande, advisor).

Milan Jovic, graduated in 2012 (Matthias Hauswirth at Universit della Svizzera italiana, advisor).

Nico Zazworka, graduated 2010 (Vic Basili, advisor).

Arya Khoshkhou, graduated 2011 (Michel Cukier, advisor).

Ananta Tiwari, graduated 2011 (Jeff Hollingsworth, advisor).

Danielle Chrun, current (Michel Cukier, advisor).

Il-Chul Yoon, graduated 2010 (Alan Sussman, advisor).

Edward Z. Pan, graduated 2009 (Jim Reggia, advisor).

Chuk-Yang Seng, graduated 2009 (Bill Arbaugh, advisor).

Robin, graduated 2009 (Michel Cukier, advisor).

Juan-Pablo Hourcade, graduated 2008 (Ben Bederson, advisor).

Jeff Carver, graduated 2005 (Vic Basili, advisor).

Okhtay Ilghami, graduated 2006 (Dana Nau, advisor).

Ugur Kuter, graduated 2006 (Dana Nau, advisor).

Fusun Yaman, graduated 2006 (Dana Nau, advisor).

Tamer M. Elsharnouby, graduated (Shankar, advisor).

Cemal Yilmaz, graduated 2005 (Adam Porter, advisor).

David Hovemeyer, graduated 2005 (Bill Pugh, advisor).

ii. Graduate (MS Thesis Committee)

Robert Gove (Ben Shneiderman, advisor).

iii. Master's Scholarly Papers

- Cyntrica Eaton. *"Improving Web-site Compliance."*
- Scott McMaster. *"Call-stack Coverage for Test-suite Reduction."*

iv. Academic Advising

- Nick Kuilema.

IV. Service and Outreach

A. Editorships, Editorial Boards, and Reviewing Activities

i. Editorial Boards

- *Empirical Software Engineering Journal.*

- *Series Editor: Advances in Computers, Elsevier.*
- *Journal of Software Testing, Verification and Reliability (STVR).*
- *Empirical Software Engineering (EMSE).*
- *The Open Software Engineering Journal (OSE).*
- *Canadian Journal of Pure and Applied Sciences (CJPAS).*

ii. Reviewing Activities for Journals and Presses

- *ACM Transactions on Programming Languages and Systems (TOPLAS)*
- *ACM Transactions on Software Engineering and Methodology (TOSEM)*
- *IEEE Software*
- *IEEE Computer*
- *IEEE Transactions on Software Engineering (TSE)*
- *Parallel Computing*
- *Software: Practice & Experience*
- *Software Testing, Verification & Reliability Journal*
- *Software Quality Journal*
- *Information & Software Technology, Elsevier*

iii. Reviewing Activities for Refereed Conferences

- International Conference on Software Engineering.
- The International Conference on Dependable Systems and Networks.
- International Conference on Software Engineering, Artificial Intelligence, Networking, Parallel/Distributed Computing.
- European Conference on Planning (ECP).
- International Static Analysis Symposium (SAS).
- International Conference on Parallel Architectures and Compilation Techniques (PACT).
- International Symposium on the Foundations of Software Engineering (FSE).
- Software Technology Conference (STC).

iv. Reviewing Activities for Books

- *Building Quality into COTS Components – Testing and Debugging,* edited by Sami Beydeda and Volker Gruhn.
- *How to Break Security; A Practical Guide to Testing Your Software's Security,* by James Whitaker and Herbert H. Thompson.
- *The Information Systems Group Project* by David A. Deeks, Pearson Education.

v. Editing Activities for Books

- *Editor:* Proceedings of The 2004 IEEE International Conference on Information Reuse and Integration.
- *Associate Editor:* Proceedings of The 2003 IEEE International Conference on Information Reuse and Integration.
- *Guest Associate Editor:* IEEE Transactions on Software Engineering, Oct. 2003.

vi. Reviewing Activities for Agencies

- National Academy of Sciences panelist for the PEER program, a collaboration between the National Science Foundation (NSF), The US Agency for International Development (USAID) and the National Academies. Partnerships for Enhanced Engagement in Research (PEER) Program is intended to allow scientists in developing countries to apply for funds to support research and capacity-building activities in partnership with their National Science Foundation-supported U.S. collaborators on topics of importance to USAID.
- National Academy of Sciences panelist in the area of Computer Science and Information Technology, Pakistan-U.S. Science and Technology Cooperative Program, sponsored by United States Agency for International Development (USAID), 2011.
- National Academy of Sciences panelist in the area of Computer Science and Information Technology, Pakistan-U.S. Science and Technology Cooperative Program, sponsored by United States Agency for International Development (USAID), 2010.
- Served as Reader for Ph.D. thesis of Teemu Kanstren, who is advised by Prof. Ilkka Tervonen, University of Oulu Dept. of Information Processing Science P.O.Box 3000, 90014 University of Oulu, Finland.
- Served on an NSF proposals' review panel, 2009.
- National Academy of Sciences panelist in the area of Computer Science and Information Technology, Pakistan-U.S. Science and Technology Cooperative Program, sponsored by United States Agency for International Development (USAID), 2009.
- National Academy of Sciences panelist in the area of Computer Science and Information Technology, Pakistan-U.S. Science and Technology Cooperative Program, sponsored by United States Agency for International Development (USAID), 2008.

- Served on an NSF SEL CAREER proposals' review panel, 2007.
- National Academy of Sciences panelist in the area of Computer Science and Information Technology, Pakistan-U.S. Science and Technology Cooperative Program, sponsored by United States Agency for International Development (USAID), 2007.
- Reviewed a proposal for the Natural Sciences and Engineering Research Council, Canada, 2006.
- Served on an NSF research proposals' review panel, 2004.
- Reviewed a research proposal for the Swedish Research Council (VR), 2003.

vii. Other Non-University Committees

- Technical Program Committee Chair, 12th IEEE International Conference on Software Testing, Verification and Validation, Xian, China, 2019.
- Program Committee Member, 11th IEEE International Conference on Software Testing, Verification and Validation, Vsters, Sweden, 2018.
- Program Committee of ICSE 2018 (40th International Conference on Software Engineering).
- Program Committee Mmeber, INTUITEST2017 (3rd International Workshop on User Interface Test Automation), Berlin, Germany, 2017.
- Program Committee Mmeber, 8th A-TEST workshop 2017, co-located with FSE2017 in Paderborn, German, 2017.
- General Chair, 10th IEEE International Conference on Software Testing, Verification and Validation, Tokyo, Japan, 2017.
- Panel Member, PhD symposium of ICST 2016.
- Program Committee for the 7th A-TEST workshop 2016, co-located with FSE 2016 in Seattle, 2016.
- Program Committee for the Regular Technical Papers Track of the 9th IEEE International Conference on Software Testing, Verification and Validation (ICST) 2016.
- Program Committee for the Testing Tool Demo Track of the 9th IEEE International Conference on Software Testing, Verification and Validation (ICST) 2016.
- Awards Chair, The 38th International Conference on Software Engineering (ICSE), Austin, Texas, USA, 2016.
- Program Committee of ICSE 2016, the 38th International Conference on Software Engineering. The conference will be held May 14-22, 2016, in Austin, Texas, USA.
- Panel Member, 6th IEEE International Workshop on Program Debugging, 2015.
- Panel Member, PhD symposium of ICST 2015.
- Panel Member, the ICST panel "Grand Challenges in Software Testing, Verification, and Validation", ICST 2015.

- Program Committee of the 1st International Workshop on User Interface Test Automation (INTUITEST 2015).
- Programme Committee of the 6th International Workshop on Automating Test case design, Selection and Evaluation held in conjunction with SEFM2015, the 13th edition of the International Conference on Software Engineering and Formal Methods, York, UK, 7-11 September 2015.
- Program Committee of the Workshop on COmplex FaUlts and Failures in LargE Software Systems (COUFLESS 2015). COUFLESS 2015 will be held in Florence (Italy), on the 23rd of May 2015.
- Program Committee of 8th IEEE International Conference on Software Testing, Verification and Validation, Graz, Austria, 2015.
- Program Committee of the 10th IEEE/ACM International Workshop on Automation of Software Test (AST 2015), which will be held on 23-24 May 2015 in Firenze, Italy, co-located with the 37th International Conference on Software Engineering (ICSE 2015).
- Program Committee of the workshop on Complex faUlts and Failures in LargE Software Systems (COUFLESS'15) that is co-allocated with the International Conference on Software Engineering in Florence, Italy in May'15.
- Program Committee of the First International Workshop on Complex faUlts and Failures in LargE Software Systems, Co-located with 22nd ACM SIGSOFT International Symposium on Foundations of Software Engineering, Hong Kong, 2014.
- Awards Chair, 36th International Conference on Software Engineering (ICSE), Hyderabad, India, 2014.
- Program Committee of 25th IEEE International Symposium on Software Reliability Engineering (ISSRE), Naples, Italy, 2014.
- Program Committee of the thematic track "Quality in Agile Methods" of the 9th International Conference on the Quality of Information and Communications Technology (QUATIC2014), Guimares, Portugal (23 to 26 September 2014).
- Program Committee of the 9th International Workshop on Automation of Software Test (AST14).
- Program Committee of the Seventh IEEE International Conference on Software Testing, Verification and Validation (ICST) 2014, Cleveland, Ohio, USA March 31 - April 4, 2014.
- Program Committee of ATSE 2014, the 5th Workshop on Automated Test Case Design, Selection and Evaluation, 2014.
- Program Committee of the 1st International Workshop on Future Internet Testing (FITTEST'2013). The workshop will be held in Istanbul, Turkey, Nov 13-15, 2013, co-located with the The 25th IFIP International Conference on Testing Software and Systems (ICTSS'13).
- Program Committee 7th India Software Engineering Conference. The conference will take place in Chennai, India in February 2014.
- Program Committee Joining AcadeMiA and Industry Contributions to testing Automation (JAMAICA) Workshop 2013 to be held in Lugano, Switzerland at the Universit della Svizzera italiana (University of Lugano) on July 15th 2013 and co-located with the ISSTA, the International Symposium in Software Testing and Analysis.

- Program Committee of ATSE 2013, the 4th Workshop on Automated Test Case Design, Selection and Evaluation, held in Krakow - Poland September 2013.
- Program Committee of QSIC 2013 (13th International Conference on Quality Software). The conference will be held in Nanjing, China in July 2013.
- Program Committee: Int. Workshop on Regression Testing, co-located with the ICST conference in Luxembourg, March 18-22, 2013.
- Program Committee: 4th International Conference on Runtime Verification (RV 2013).
- Member of PhD Symposium at ICST 2013.
- Program Committee of the Testing: Academic and Industrial Conference - Practice and Research Techniques (TAIC PART), 2013.
- Member of the ICSE 2013 Mentoring Committee.
- Program Committee of the main track of QUATIC'2012 - 8th International Conference on the Quality of Information and Communications Technology, which will take place in Lisbon, September 3-6, 2012.
- Program Committee of the second International Workshop on End-to-end Test Script Engineering (ETSE), to be held with ISSTA 2012.
- Program Committee: 3rd International Conference on Runtime Verification (RV 2012).
- Program Committee: Thematic track Quality in Agile Methods of the 8th International Conference on the Quality of Information and Communications Technology (QUATIC? @ Y2012), to be held in Porto (3,4 and 5 September 2012).
- Program Committee: AST 2012, to be held during June 2-3, 2012 in conjunction with ICSE'12.
- Program Committee: IEEE 20th International Requirements Engineering Conference – Industry Track, 2012, Chicago, USA.
- Program Committee: The 2nd International Workshop on Regression Testing, co-located with the ICST conference in Montreal, Canada.
- Program Committee: Testing Academic & Industrial Conference - Practice and Research Techniques (TAIC-PART), 2012, co-located with the ICST conference in Montreal, Canada.
- Member of the ICSE 2012 Mentoring Committee.
- Program Committee of the 12th International Conference on Quality Software (QSIC 2012) will be held in Xian China on August 27-28, 2012.
- Elected member of the Steering Committee of the International Conference on Software Testing, Verification and Validation ICST, the largest conference on software testing. The Steering Committee has the responsibility to strategically lead the conference in the long term.
- Program Committee ICSM Industry Track, held from September 25 until October 1, 2011 in Williamsburg, VA, USA, 2011.

- Program Committee ADVCOMP 2011, The Fifth International Conference on Advanced Engineering Computing and Applications in Sciences, November 20-25, 2011 - Lisbon, Portugal, under the NexTech 2011 umbrella.
- Program Committee: 6th IEEE International Workshop on Automation of Software Test (AST2011), an ICSE2011 workshop. The workshop will be held within May 21-28, 2011.
- Program Committee: Testing Academic & Industrial Conference - Practice and Research Techniques (TAIC-PART), 2011, co-located with the ICST conference in Berlin, Germany.
- Workshops Co-Chair: The 9th Annual International Conference on Mobile Systems, Applications and Services, 2011.
- Program Committee: VALID 2011, The Third International Conference on Advances in System Testing and Validation Lifecycle VALID 2011 is scheduled to be October 23-28, 2011 - Barcelona, Spain, under SoftNet 2011 umbrella.
- Member PhD Symposium Committee: The 4th IEEE International Conference on Software Testing Verification and Validation (ICST'11), 2011.
- Member of the ICSE 2011 Mentoring Committee.
- General Chair of the Third International Workshop on TESTing Techniques & Experimentation Benchmarks for Event-Driven Software: TESTBEDS 2011 – GUI and Web Applications.
- Program Committee 11th International Conference On Quality Software (QSIC 2011). The conference will be held in Madrid, Spain in July 13-14, 2011.
- Organizing Committee of the Workshop on Experimental Evaluation of Software and Systems in Computer Science (Evaluate 2010), Co-located with SPLASH'10 in Reno/Tahoe, Nevada, October 17-21, 2010.
- Session Chair: ICST 2010.
- Program Committee of Early Research Achievements (ERA) Track at the 26th IEEE International Conference on Software Maintenance (ICSM R10). The ICSM R10 conference will be held on September 12-18, 2010 in Timisoara, Romania.
- Program Committee for ICIS 2010 in 2010. ICIS 2010 will be held in Yamagata, Japan, on August 18-20, 2010.
- Program Committee: 4th India Software Engineering Conference, Thiruvananthapuram, India.
- Program Committee: Testing Academic & Industrial Conference - Practice and Research Techniques (TAIC-PART), 3–5 Sep. 2010, at the Cumberland Lodge in Windsor, UK.
- General Chair of Second International Workshop on TESTing Techniques & Experimentation Benchmarks for Event-Driven Software: TESTBEDS 2010 – GUI and Rich Internet Applications.
- Program Committee of the thematic track "Quality in Agile Methods" of the 7th International Conference on the Quality of Information and Communications Technology (QUATIC'2010), to be held in Porto (29 September to 2 October 2010).

- Program Committee 21st IEEE International Symposium on Software Reliability Engineering (ISSRE 2010), to be held on the CISCO campus in San Jose, California, November 1-4, 2010.
- Program Committee 5th Automated Software Test (AST 2010), a workshop co-located with ACM/IEEE 32th International Conference on Software Engineering (ICSE 2010). AST 2010 will be a two-day event to be held on 3-4 May 2010.
- International Program Committee ICSOFT 2010: 5th International Conference on Software and Data Technologies, 2010.
- Program Committee ADVCOMP 2010, The Fourth International Conference on Advanced Engineering Computing and Applications in Sciences, October 25 - 30, 2010 - Florence, Italy.
- Program Committee: SERA 2010, the 8th ACIS International Conference on Software Engineering Research, Management and Applications (SERA2010). Sponsored by International Association for Computer and Information Science (ACIS).
- Program Committee: VALID 2010, The Second International Conference on Advances in System Testing and Validation Lifecycle. VALID 2010 is scheduled to be August 22-27, 2010 - Nice, France.
- Program Committee: the International Conference on Information Science and Applications (ICISA 2010), hosted by the Center for Industry Security (CIS) and co-sponsored by Kyunggi University and IEEE Computer Society. ICISA 2010 will be held in Seoul, Korea, on January 27-29, 2010.
- Program Committee Member for INTENSIVE 2010, The Second International Conference on Intensive Applications and Services, March 7-13, 2010 - Cancun, Mexico.
- Program Committee Member 10th International Conference on Quality Software (QSIC 2010). The conference will be held in Zhangjiajie, China on July 14-15, 2010.
- Program Committee: The 3rd IEEE International Conference on Software Testing Verification and Validation (ICST'10), 2010.
- PhD Symposium Chair: The 3rd IEEE International Conference on Software Testing Verification and Validation (ICST'10), 2010.
- Program Committee: 3rd India Software Engineering Conference (ISEC 2010), to be held in Mysore, India in Feb 2010.
- General Chair of First International Workshop on TESTing Techniques & Experimentation Benchmarks for Event-Driven Software: TESTBEDS 2009 – GUI Testing.
- Program Committee: ICSM 2009, the 25th IEEE International Conference on Software Maintenance. The conference will be held on September 20-26, 2009, in Edmonton, Alberta, Canada.
- Program Committee: WWW 2009 Web Engineering Track (http://www2009.org/calls/webeng.html). WWW 2009 will be held in Madrid, Spain, from 20 to 24 April 2009.
- Program Committee: Testing Academic & Industrial Conference - Practice and Research Techniques (TAIC-PART), 4–6 Sep. 2009, at the Cumberland Lodge in Windsor, UK.
- Program Committee: VALID 2009, The First International Conference on Advances in System Testing and Validation Lifecycle. VALID 2009 is scheduled on September 20-25, 2009 - Porto, Portugal under SoftNet 2009 umbrella.

- Program Committee: ICSEA 2009, The Fourth International Conference on Software Engineering Advances. ICSEA 2009 is scheduled to be in Porto - Portugal, September 20-25, 2009.
- Program Committee ADVCOMP 2009, The Third International Conference on Advanced Engineering Computing and Applications in Sciences, Sliema - Malta, October 11-16, 2009.
- Program Committee: (SNPD 2009) The 10th ACIS International Conference on Software Engineering, Artificial Intelligence, Networking, and Parallel/Distributed Computing is sponsored by ACIS in cooperation with IEEE, Catholic University of Daegu and the Korean Society for Internet Information, 2009.
- Program Committee: Ninth International Conference on Quality Software (QSIC 2009), Jeju, Korea, August 24-25, 2009.
- Program Committee Member for the Software Engineering Symposium, a part of the 2009 World Congress on Computer Science and Information Engineering, March 31-April 2, 2009, Los Angeles/Anaheim.
- Program Committee for 8th IEEE/ACIS International Conference on Computer and Information Science in 2009. ICIS 2009 will be held in Shanghai, China, on June 1-3, 2009.
- International Program Committee ICSOFT 2009: 4th International Conference on Software and Data Technologies, 2009.
- International Program Committee for The 7th ACIS International Conference on Software Engineering Research, Management and Applications (SERA2009). Sponsored by International Association for Computer and Information Science (ACIS). SERA 2009 will be held on Hainan Island in the city of Haikou, China December 2-4, 2009.
- Program Committee Member for INTENSIVE 2009, The First International Conference on Intensive Applications and Services, Valencia, Spain, on April 21-25, 2009.
- Program Committee of WebTest 2009, the 1st International Workshop on Web Testing, to be held on April 1st or 4th, 2009, in co-location with ICST 2009 (Int. Conf. on Software Testing), Denver, Colorado, USA.
- Technical Program Committee: Second IEEE International Conference on Software Testing, Verification and Validation, ICST 2009.
- PhD Symposium Chair: The 2nd IEEE International Conference on Software Testing Verification and Validation (ICST'09), 2009.
- Program Committee: 2nd India Software Engineering Conference (ISEC 2009), to be held in Pune, India, Feb 25-28 2009.
- Program Committee: 30th International Conference on Software Engineering (ICSE 2008), Leipzig, Germany, May 10-18 2008.
- Program Committee: Testing Academic & Industrial Conference - Practice and Research Techniques (TAIC-PART), 29-31 August 2008, at the Cumberland Lodge in Windsor, UK.
- Program Committee: ICSM 2008, the 24th IEEE International Conference on Software Maintenance. The conference will be held on September 28 to October 4, 2008, in Beijing, China.

- Program Committee: Software Engineering Research, Management and Applications Conference (SERA 2008). SERA 2008 will be hosted by Charles University in Prague. The conference is scheduled for August 20-22, 2008.
- Program Committee: Third International Conference on Software and Data Technologies (ICSOFT 2008), Porto (Portugal), on July 2008. The conference is organized by INSTICC, co-sponsored by the Workflow Management Coalition (WfMC) in cooperation with the IICREST.
- Program Committee: 9th International Conference on Software Engineering, Artificial Intelligence, Networking, and Parallel/Distributed Computing in 2008 (SNPD 2008), Phuket, Thailand, on August 6 - 8, 2008.
- Program Committee: Eighth International Conference on Quality Software (QSIC 2008), Oxford, England, 12–13 August 2008.
- Technical Program Committee: International Conference on Software Engineering Advances (ICSEA 2008), October 26 - 31, 2008, Sliema, Malta.
- Program Committee: 7th IEEE/ACIS International Conference on Computer and Information Science (ICIS 2008), Portland, Oregon, May 14 - 16, 2008.
- Technical Program Committee: Second International Conference on Advanced Engineering Computing and Applications in Sciences (ADVCOMP 2008), Valencia, Spain, on September 29 - October 4, 2008.
- Program Committee: Second International Workshop on Software Test Evaluation (STEV 2008). Co-located with ICST 2008, which will take place in Lillehammer, Norway on April 9-11, 2008.
- Program Committee: Web Engineering Track of The 17th International World Wide Web Conference (WWW 2008), Beijing, China, April 21-25, 2008.
- Program Committee: Industry Track of the First IEEE International Conference on Software Testing, Verification and Validation (ICST 2008), 9-11 April 2008, in Lillehammer, Norway.
- Technical Program Committee: Research Track of the First IEEE International Conference on Software Testing, Verification and Validation (ICST 2008), 9-11 April 2008, in Lillehammer, Norway.
- Technical Program Committee: International Conference on Advanced Engineering Computing and Applications in Sciences (ADVCOMP 2007), Tahiti, French Polynesia, Nov. 4–9, 2007.
- Program Committee: First International Workshop on Software Test Evaluation, (STEV 2007), 11 October, 2007 Portland, Oregon, USA.
- Program Committee: 7th International Conference On Quality Software (QSIC 2007), 11-12, October, 2007 Portland, Oregon, USA.
- Program Committee: 5th IEEE International Conference on Software Engineering Research, Management and Applications (SERA2007) in conjunction with 1st International Workshop on Advanced Internet Technology and Applications (AITA2007) August 20 - 22, 2007 Haeundae Grand Hotel, Busan, Korea.
- Program Committee: 2007 International Workshop on Distance Education Technologies (DET 2007), San Francisco Bay, September 6–8, 2007, joint with the 2007 International Conference on Distributed Multimedia Systems (DMS 2007).

- Program Committee: 8th International Conference on Software Engineering, Artificial Intelligence, Networking, and Parallel/Distributed Computing (SNPD2007), Qingdao, China, July 25-27, 2007.
- Technical Program Committee: International Conference on Software Engineering Advances (ICSEA 2007), Cap Esterel, French Riviera, France, August 25-31, 2007.
- Program Committee: IEEE International Workshop on Testing for Emerging Software Technology (TEST 2007), part of the 31st International Computer Software and Applications Conference (COMPSAC).
- Program Committee: ICSM 2007, the 23th IEEE International Conference on Software Maintenance.
- Program Committee: Workshop on Integrating System Environments into Software Testing (WISEST 2007).
- Program Committee: First International Workshop on Model-Based Testing and Object-Oriented Systems (M-TOOS 2006), affiliated with OOPSLA 2006, Portland, OR, USA, Oct. 23, 2006.
- Program Committee: 6th International Conference On Quality Software (QSIC 2006), Beijing, China, Oct. 26-28, 2006.
- Technical Program Committee: International Conference on Software Engineering Advances (ICSEA 2006), Tahiti, French Polynesia, Oct. 29–Nov. 1, 2006.
- Program Committee: Doctoral Symposium of the 21st IEEE/ACM International Conference on Automated Software Engineering (ASE 2006), Tokyo, Japan, Sep. 18-22, 2006.
- Program Committee: Second International Workshop on Testing and Quality Assurance for Component-Based Systems (TQACBS 2006), in conjunction with COMPSAC 2006, Chicago, IL, USA, Sep. 18-21, 2006.
- Program Committee: Web Engineering Track of The Fifteenth International World Wide Web Conference (WWW 2006), Edinburgh, Scotland, May 23–26, 2006.
- Program Committee: 3rd ACIS International Conference on Software Engineering Research, Management & Applications (SERA 2005), Central Michigan University, Mount. Pleasant, Michigan, USA, Aug. 11–13, 2005.
- Technical Committee: First International Conference on Information and Communication Techniques (ICICT 2005), Karachi, Pakistan, Aug. 27–28, 2005.
- Program Committee: First International Workshop on Testing and Quality Assurance for Component-Based Systems (TQACBS 2005), in conjunction with COMPSAC 2005, Edinburgh, Scotland, July 25-28, 2005.
- Program Committee: International Workshop on Frontiers of Information Technology (FIT 2004), Islamabad, Pakistan, Dec. 20-21, 2004.
- Program Committee: Web Engineering Track of The Fourteenth International World Wide Web Conference (WWW2005), Chiba, Japan, May 10-14, 2005.
- Program Committee: The 1st International workshop on Web Quality (WQ 2004), in conjunction with the International Conference on Web Engineering (ICWE 2004), Munich, Germany, July 28-30, 2004.

- Program Committee: Net.ObjectDays 2004 Workshop – Testing Component-based Systems (TECOS 2004), Erfurt, Germany, Sep. 27-30, 2004.
- Program Committee: Building Quality into COTS Components – Testing and Debugging, a book edited by Sami Beydeda and Volker Gruhn, University of Leipzig, Germany.
- Session Chair: Platform and language-specific re-engineering, The 11th IEEE Working Conference on Reverse Engineering (WCRE 2004), Delft University of Technology, the Netherlands, Nov. 9-12, 2004.
- Program Committee: The 11th IEEE Working Conference on Reverse Engineering (WCRE 2004), Delft University of Technology, the Netherlands, Nov. 9-12, 2004.
- Program Committee: 5th International Conference on Software Engineering, Artificial Intelligence, Networking, and Parallel/Distributed Computing (SNPD2004), Beijing, China, June 30-July 2, 2004.
- Session Chair: The IASTED International Conference on ARTIFICIAL INTELLIGENCE AND APPLICATIONS (AIA 2004), Innsbruck, Austria, Feb. 16-18, 2004.
- Publications Chair: IEEE International Conference on Information Reuse and Integration (IRI 2004), Las Vegas, NV, USA, Nov. 8–10, 2004.
- Publications Chair: IEEE International Conference on Information Reuse and Integration (IRI 2003), Las Vegas, NV, USA, Oct. 27–29, 2003.
- Advisory Board: 15th International Internet & Software Quality Week (QW 2002), San Francisco, California, USA, Sep. 3–6 2002.
- Session Chair: Dynamic Program Analysis, Tenth International Symposium on the Foundations of Software Engineering (FSE-10), Charleston, SC, USA, Nov. 18–22, 2002.
- Program Committee: Tenth International Symposium on the Foundations of Software Engineering (FSE-10), Charleston, SC, USA, Nov. 18–22, 2002.
- Advisory Board: 14th International Internet & Software Quality Week (QW 2001), San Francisco, CA, USA, May 29–June 1 2001.

viii. International Activities

- Served as Reader for Ph.D. thesis of Teemu Kanstren, who is advised by Prof. Ilkka Tervonen, University of Oulu Dept. of Information Processing Science P.O.Box 3000, 90014 University of Oulu, Finland, 2009.
- Worked closely with instructors of the Department of Software Engineering at the Singapore Management University to improve their courses and projects, 2006-2007.
- Advising two Masters students in Kabul, Afghanistan, 2006-2007.

ix. Paid Consultancies

- Worked at the Fraunhofer Center for Experimental Software Engineering. Participated in the following projects:
  - "DoD Software Intensive Systems (SIS) Experience Factory Support," funded ($310,000) by the *Office of the Under Secretary of Defense (OUSD) SIS*, (May 1, 2001–Apr. 30, 2003).
  - "GSFC Effort Estimation Process," funded ($134,000) by the *NASA Goddard*, (Aug. 1, 2003–Apr. 30, 2004).

B. Campus Service

i. Department

- UG Honors Chair, 2013-2014.
- UG Honors Chair, 2012-2013.
- 2013: APT committee to consider the promotion of Evan Golub to Senior Lecturer.
- 2012-2013: Committee to examine the curricula of 100-300 level courses and to revise them to support the higher level courses in our program.
- 2012-2013 UG Awards and Scholarship Committee.
- Dept. Computer systems administrator search committee, 2011-2012.
- Honors Committee, 2011.
- UG Awards and Scholarship Committee, 2011.
- UG Awards and Scholarship Committee, 2010.
- UG Awards and Scholarship Committee, 2009.
- Member, Graduate admissions committee, 2009.
- Member, Middle States Evaluation Committee, 2008-2009.
- Member, Computer Lab Committee, 2008-2009.
- Teaching Evaluation Committee, 2008-2009.
- Dean's fellowships committee, 2008.
- APT reviewer for Vibha Sazwal, 2008.
- Member, Graduate admissions committee, 2008.
- Computational Biology faculty search committee, 2007.
- Dept. rep. PCC, 2007.

- Spoke at the Undergraduate Visit Day Reception – "Meet Our Family!!", 2007. Topic: Programming Languages.
- Member, Graduate admissions committee, 2007.
- Spoke at the workshop for undergraduate students on the importance of graduate school, 2006. Topic: "The importance of doing research as an undergrad, and how to go about doing it."
- Member, Computer Lab Committee, 2006-2007.
- Organized the discussion on Software Engineering with the CS Advisory Board, 2006.
- Member, committee for revising graduate course requirements, 2005-2006.
- Member, Graduate admissions committee, 2006.
- Spoke at the workshop for undergraduate students on the importance of graduate school, 2005. Topic: "The importance of doing research as an undergrad, and how to go about doing it."
- Spoke at the AWC lecture to inform women about upcoming 400 level courses, 2005.
- Member, Department scholarships review committee, 2005.
- Member, Search Committee to fill Carole's Position in the Business Office, 2005.
- Member, Software Engr/Programming Languages/HCI field committee, 2001-present.
- Member, Computer Lab Committee, 2005-2006.
- Teaching Evaluation Committee, 2005.
- Graduate admissions committee, 2005.
- Spoke at the workshop for undergraduate students on the importance of graduate school, 2004. Topic: "The importance of doing research as an undergrad, and how to go about doing it."
- Spoke at the AWC lecture to inform women about upcoming 400 level courses, 2004.
- Graduate Student Placement Committee, 2004.
- Teaching Evaluation Committee, 2004.
- IBM Student Fellowship Nomination Committee, 2003.
- Spoke at CMSC838G on "What is going on in Software Engineering."
- Spoke at the workshop for undergraduate students on the importance of graduate school, 2003. Topic: "The importance of doing research as an undergrad, and how to go about doing it."
- Spoke at the AWC lecture to inform women about upcoming 400 level courses, 2003.
- Teaching Evaluation Committee, 2003.
- Spoke at the AWC lecture to inform women about upcoming 400 level courses, 2002.
- Undergraduate Course Revision Committee, 2002.

- Member of departmental committee to recruit better quality graduate students, Fall 2001.
- Friday Faculty Lunch Coordinator, Fall 2001.
- President of Pakistan Students' Association, University of Pittsburgh (1997-2001).
- President of Graduate Students' Association, University of Pittsburgh (1999-2001).
- Vice President of Graduate Students' Association, University of Pittsburgh (1998-1999).
- President of Graduate Students' Association, University of Pittsburgh (1997-1998).
- Editor-in-Chief On-Line Magazine, University of Karachi (1990-1992).
- Editor On-Line Magazine, University of Karachi (1989-1990).

ii. College

- Member, Design Outcome Oversight Committee (DOOC), 2012-2014
- Member, Design Outcome Oversight Committee (DOOC), 2011-2012
- Spoke at the Undergraduate Visit Day.
- Member, Organizing committee for Software Day event, 2007.
- Member, Organizing committee for Software Day event, 2006.
- Met with UMIACS External Review Committee, 2006.
- Met with visitors from Tata Consulting Services; discussed software engineering research projects at CS Maryland, 2005.
- Member: UMIACS APT Committee, 2004.
- Chair: UMIACS short courses committee, 2004.
- Participated in Strategic Directions in IT meeting, Nov 24, 2003.
- Member: UMIACS Director Search Committee, 2000–2001.

iii. University

- Member: HPCC Allocations/Advisory Committee, Office of Information Technology, 2007-2014.
- Computer Security Scholars Faculty Mentor, 2009.
- External Reviewer for the CMIT program, UMUC, 2008.
- Participated in a panel: CAREER proposal preparation workshop June 21, 2006.
- Member: HPCC Allocations/Advisory Committee, Office of Information Technology, 2006.

C. Community

- Reviewer, Intel Science Talent Search, Dec., 2013.
- Reviewer, Intel Science Talent Search, Dec., 2012.
- Reviewer, Intel Science Talent Search, Dec., 2011.
- Reviewer, Intel Science Talent Search, Dec., 2010.
- Reviewer, Intel Science Talent Search, Dec. 8, 2007.
- Reviewer, Intel Science Talent Search, Dec. 8, 2006.
- Reviewed another book proposal for the Cambridge University Press, Sep. 15, 2006.
- Reviewed a book proposal for the Cambridge University Press, July 24, 2006.
- Reviewer, Intel Science Talent Search, Dec. 8, 2005.
- Developed and conducted a tutorial on software testing to employees at the National Institutes of Health, Mar. 22, 2004.
- Reviewer, Intel Science Talent Search, Dec. 4, 2004.
- Reviewer, Intel Science Talent Search, Dec. 6, 2003.
- Reviewed a book proposal for the Business Education Publishers Limited, Dec. 5, 2003.
- Chaired a meeting for managers at the National Institutes of Health to increase Software Quality awareness, Dec. 01, 2003.
- Developed and taught a short course on Software Testing at the National Institutes of Health, Aug. 05, 2003.
- Developed and conducted two one-day workshops on Software Quality Assurance for employees of the Hughes Network Systems, June 20, 2003.

V. Awards and Honors

- Fraunhofer-Bessel Research Award from the Humboldt Foundation and the Fraunhofer Society for the Advancement of Applied Research, 2016.
- Best paper award – The Eighth International Conference on Emerging Security Information, Systems and Technologies (SECURWARE 2014).
- "Retrospective" award for the most influential paper among the papers of 2003 Working Conference on Reverse Engineering, (2013).
- National Science Foundation CAREER Award (2005).
- Best paper award – The Australian Software Engineering Conference (ASWEC 2004).

- The CS department post-proposal graduate research award, Department of Computer Science, University of Pittsburgh (2001).
- Andrew Mellon Pre-doctoral Fellowship for the second year (2000-2001).
- Chancellor's Honor Roll, University of Pittsburgh (2000-2001).
- Andrew Mellon Pre-doctoral Fellowship (1999-2000).
- Chancellor's Honor Roll (1999-2000).
- KFUPM Scholarship for entire M.S. period (1993-1996).
- Gold Medal in B.S., University of Karachi (1992).