ADITYA P. MATHUR

March 10, 2021

EDUCATION

1970	BS (Hons) Electrical Engineering	BITS[§]
1972	MS (Hons) Electrical Engineering	BITS
1977	PhD Computer Science	BITS
1996	Minor in Music	Purdue University*

[§] Birla Institute of Technology and Science, Pilani, India. * Requirements met but no formal diploma.

PROFESSIONAL/ADMINISTRATIVE POSITIONS

August 1972–December 1973	Programmer	BITS
January 1973–March 1976	Assistant Lecturer	BITS
April 1976–February 1982	Assistant Professor[†]	BITS
March 1982–August 1985	Associate Professor	BITS
	Head, Computer Science	BITS
September 1985–August 1987	Visiting Associate Professor	Georgia Institute of Technology
September 1987–July 1989	Visiting Associate Professor	Purdue University
August 1989–July 1996	Associate Professor	Purdue University
January 1, 1994–June 30, 1994	Acting Director, SERC[‡]	Purdue University
July 1995–June, 2001	Executive Director, SERC	Purdue University
August 1996–August 2019	Professor	Purdue University
August 2019–	Professor Emeritus	Purdue University
August 1997–June 2001	Associate Head	Computer Science, Purdue University
July 2003–December 2003	Visiting Professor	BITS
August 2004–June 2007	Associate Dean, Grad Edu and Intl Programs	College of Science, Purdue University
August 2005–	Adjunct Professor	BITS
July 2007–September 2010	Head	Computer Science, Purdue University
August 2009–	Member, Advisory Board	Handbook of Automation (Ed: S.Y. Nof)
June 1, 2012–June 30, 2018	Head of Pillar	ISTD*, SUTD** (On leave from Purdue)
June 1, 2012–Feb 27, 2014	Acting Center Director, iTrust	SUTD
Feb 28, 2014–	Center Director, iTrust	SUTD
April 1, 2019–	Director	National Satellite of Excellence, SUTD, & iTrust Laboratories

[†] Double promotion. [‡] Software Engineering Research Center. * Information Systems Technology and Design

** Singapore University of Technology and Design

HONORS AND AWARDS

Teaching

1. Top 10 Outstanding Teacher in the School of Science during 1990-91, 91-92, 93-94, and 94-95.
2. Finalist, Indiana Information Technology Association's Outstanding Educator Award, 2000.
3. ACM Faculty Award, Department of Computer Science, Purdue University, 2012

Service and related

1. Outstanding Service Award, 2002 from the Software Engineering Research Center.
2. Fellow, CIC Academic Leadership Program, 2004-2005.
3. Outstanding Achievement Award, Software Engineering Society, 2010
4. IT Man of India, 2003, awarded by Rakshpal Bahadur Management Institute, Bareilly, India.
5. BITS Pilani Distinguished Alumnus Award 2020.

Keynotes

1. **Chelmsford Distinguished Speaker**, Cadence Corporation, 1998.
2. **Distinguished Speaker**, Department of Computer Science, Washington State University, Pullman, WA, 2000.
3. **Distinguished Speaker**, Center for Advanced Computer Studies, University of Louisiana, 2001.
4. at Rakshpal Bahadur Management Institute, Bareilly, India during an International Seminar on "Success Mantras for IT Industry in the Next Decade."
5. Next Generation keynote speaker at SDPS 2010 (Society for Design and Process Science), Dallas, June 6-11, 2010.
6. Invited Speaker: International Security Workshop, Hyderabad, India, December 2012.
7. **Special Keynote speaker**: 4th International Conference: CONFLUENCE 2013, Amity University, Noida, India, September 27, 2013.
8. PRDC 2014, Singapore, November 19, 2014.

9. ICTeR 2014, Colombo, Sri Lanka, December 10, 2014.
10. Invited speaker COMPSAC 2016, Atlanta, June 10-14, 2016.
11. Gurudakshina by BITS Alumni "in the honour of the Gurus[1] who had taught them during 1970-75", 2017.
12. 4th ACM Cyber-Physical System Security Workshop (CPSS 2018), Incheon, Korea, June 4, 2018.
13. 2nd Workshop on Cyber-Physical Systems Security and Resilience (CPS-SR) Montreal, Canada, April 15, 2019
14. "Protecting Your Critical Infrastructure During a Cyber War," The 22nd International Conference on Information and Communications Security (ICICS 2020), Copenhagen, Denmark, August 24, 2020.

PROFESSIONAL MEMBERSHIPS

Co-Founder of PRISM Center for Production, Robotics, and Integration Software for Manufacturing & Management."

ADMINISTRATIVE ACCOMPLISHMENTS

Head, Department of Computer Science, BITS, Pilani, India

- Designed, developed, and implemented an entirely new system for student academic administration (grade entry, transcript preparation, registration, etc.). Worked in close consultation with the Vice Chancellor, Dean of Instruction Division, and several department heads. Role: Project management, system design, coding, and testing. The team of programmers consisted of five programmers and several data entry assistants. I led the team.

Executive Director, Software Engineering Research Center (SERC)

- Led the center's growth from 1994-2001 after taking over its directorship from Richard DeMillo. At its height, faculty from nine universities were actively participating in the center's research program that was supported by 15 companies. I relinquished the directorship in 2001 to Ball State University. The center is in excellent shape and is the longest running NSF I/UCRC today.
- Expanded university participation by formally including the University of West Virginia.

[1] Guru: Teacher

- Organized large scale WEB development effort, with NSF funding, between Purdue and participating universities from Oregon.

Associate Head, Department of Computer Science

- Actively participated in the design of a new undergraduate curriculum.
- Designed new undergraduate courses, especially the course in Software Engineering that continues to have industry participation.

Associate Dean of Graduate Education and International Programs

- Drafted and obtained approval from all department heads, a college-wide policy to provide written performance feedback to graduate students working towards Ph.D. The policy was first implemented in the Department of Computer Science.
- Led the design and development of Purdue University Research Expertise database (PURE) to assist with the NRC rankings effort. This required collaboration with over 50 heads of academic departments at Purdue, the Office of the President, and several other non-academic units at Purdue. The project was funded by Purdue and Indiana Economic Development Corporation. This has now led to the INDURE system (www.indure.org) which is one of the most advanced academic expertise search system anywhere. This work is in collaboration with a colleague Professor Luo Si. The idea of developing PURE originated from Jeffrey Vitter the then Dean of the College of Science at Purdue University.
- Reorganized the graduate interdisciplinary program in Computational Life Science.

Head, Department of Computer Science, Purdue University

Accomplishments mentioned below are in collaboration with Mike Atallah (Associate Head), Tim Korb (Assistant Head), and the faculty and staff of the Department of Computer Science.

- Led the effort to create WEB-based software applications for (i) on-line evaluation and monitoring of graduate admissions process and (ii) faculty teaching assignments.
- Nearly doubled the graduate enrollment.
- Led a 2-year effort to completely revise the undergraduate curriculum; the new curriculum, implemented starting Fall 2010, has a small core and allows students to specialize using tracks. It is flexible, attractive and relevant.

- Introduced concurrent programming in freshman programming class. In Fall 2008, taught an experimental freshman course on Concurrent Programming using Java. Co-instructors included Barry Wittmann and Tim Korb with whom I wrote a textbook for the course.
- Led the effort to introduce robots and smart phones into laboratories in freshman programming classes.
- Crafted and implemented a new policy for assigning research space to faculty.
- Established the formal study abroad and exchange programs with universities in China, India, and Sweden.
- Managed the doubling of graduate enrollment during 2007-2010.
- (a) Proposed the realignment of the Department of Computer Science with the College of Engineering. This proposal is under discussion since 2008 among faculty and higher administration.

  (b) Completed two white papers that provide the rationale in support of the proposal and the pros and cons of various administrative models.

  (c) In March 2011 an External Review committee visited the department and evaluated its strengths and weaknesses. I had prepared the departmental summary for the committee. The committee was impressed with the accomplishments made during my tenure as the department head. Members of the committee discussed the issue of moving CS to the College of Engineering, the committee took up the issue with the faculty and senior Purdue administrators in all its seriousness. They recommended that Purdue examine the consolidation of its various offerings in computing including those from Computer Engineering and Computer Science. The committee's recommendation led the Provost to issue a memo indicating that he would form a task force to consider the matter and make recommendations.

  (d) I maintain a public blog on the events related to the realignment issue. The blog and nearly all the related documents that I prepared are available at the following site.

  `http://www.cs.purdue.edu/homes/apm/RealignmentStatus.html`

RESEARCH INTERESTS

Design of secure Critical Infrastructure, Software testing and reliability, Management of Internet Services, Program sonification, Parallel architectures and algorithms, Software Process Control, Information Retrieval, Music composition.

PUBLICATIONS (all authors are equal coauthors)

TEXTBOOKS

1. *Introduction to Microprocessors*, Tata-McGraw Hill, First edition 377 pp. 1980, Second edition 480 pp., 1984.

2. *Introduction to Pascal*, Tata-McGraw Hill, coauthors: Kulbir S. Arora (SUNY at Buffalo) and Uday S. Reddy, University of Birmingham), 370 pp., 1983.

3. *A soft introduction to computer programming*, 500 pages, 1984. Accepted for publication by Tata-McGraw Hill but never published as I could not find time to prepare the final camera ready copy.

4. *Introduction to Microprocessors*, Third edition, Tata-McGraw Hill, 612 pp., 1989. [35th reprint in 2011. ISBN-13: 978-0-07-460222-5. ISBN-10: 0-07-460222-5.]

5. *Introduction to Microprocessors*, Third edition, Answers to all the Exercises, Tata-McGraw Hill, 176 pp., 1989.

6. *Foundations of Software Testing*, 689 pages, Pearson Education, 2007. ISBN 81-317-1660-0.

7. *Start Concurrent: An Introduction to Problem Solving in Java with a Focus on Concurrency*, with Barry Wittman and Tim Korb. Purdue University Press, 656pp, 2013. ISBN-10: 1557536724. ISBN-13: 978-1557536723

8. *Foundations of Software Testing, Second Edition*, 728 pages, Pearson Education, 2013. ISBN:9788131794760.

BOOK CHAPTERS

9. *Parallel models in software life-cycle*, in Empirical Foundations of Information and Software Science V, Ed. Pranas Zunde and Dan Hocking, Plenum Press, 1990.

10. *Mutation Testing*, Encyclopedia of Software Engineering, John Wiley & Sons, Inc., pp 707-713, 1994.

11. *Software Testing and Reliability*, in McGraw Hill Software Reliability Engineering Handbook, 1996, Ed. Michael R. Lyu, co-author: J. R. Horgan.

12. *Fault-based Testing of CORBA Component Software*, S. Ghosh and A. P. Mathur, Book Series on Component-Based Software Development, Vol 1, Ed. Kung-Kiu Lau, World Scientific Press, March 2004.

13. *Software Cybernetics*, João W. Cangussu, Kai-Yuan Cai, Scott D. Miller, Aditya P. Mathur, Encyclopedia of Computer Science and Engineering, John Wiley and Sons, December 2007.

14. *Enterprise Access Control Policy Engineering Framework*, in Handbook of Research on Information Security and Assurance, Ed: Jatinder Gupta and Sushil Sharma, Chapter XXVIII, Arjmand Samuel, Ammar Masood, Arif Ghafoor, and Aditya Mathur, August 2008.

15. *Quantitative modeling for software process control*, Scott Miller, Raymond DeCarlo, and Aditya Mathur, 72pp. In Adaptive Control Approach for Software. World Scientific Publishing Company, April 2011.

16. *Modeling, Analysis, and Testing of System Vulnerabilities*, Fevzi Belli, Mutlu Beyazit, Aditya Mathur, and Nimal Nissanke. Ed: Ali Hursan and Sarah Sedigh. Advances in Computers, pages 39–92, Volume 84, 2012.

REFEREED JOURNALS

17. An SLR(1) Parser Generating System, *Journal of Computer Society of India*, Vol. 5, 1975, pp. 3-7 (with S.K. Jain, M.L. Suthar, and Krishna Kant).

18. Some Problems and Solutions in the Design of a Reconfigurable Transputer Based Multiprocessor, *International Journal of Mini and Microcomputers*, Vol. 10, 1988, pp. 14-20 (with Kui Wenming).

19. Exploiting Parallelism Across Program Execution: A Unification Technique and Its Analysis, *IEEE Transactions On Parallel and Distributed Computing*, Vol. 1, 1990, pp 399-414 (with V. J. Rego)[2].

20. Concurrency Enhancement Through Program Unification: A Performance Analysis, *Journal of Parallel and Distributed Computing*, Vol. 8, 1990, pp. 210-217 (with V. J. Rego).

21. High Performance Software Testing On SIMD Machines, *IEEE Transactions On Software Engineering*, Vol. 17, No. 5, May 1991, pp. 403-423 (with V. J. Rego and E.W. Krauser).

22. Parallel Parsing on a Transputer Network, *Journal of Computer System Sciences and Engineering*, Vol. 7, No. 3, July 1992, pp. 152-159 (with W. B. Ligon).

[2]This paper was originally accepted for publication in the IEEE Transactions on Computers. The Editor informed us that there was a backlog of three years. For faster availability to the community, we accepted the editor's offer of publishing the paper in IEEE Transactions On Parallel and Distributed Computing.

23. Assessing Tools in Research and Education, *IEEE Software*, May 1992, pp. 61-69 (with J. R. Horgan).

24. An Application of Program Unification to Priority Queue Vectorization, *International Journal of Parallel Programming*, Vol. 21, No. 3, June 1992,pp. 193-224 (with L. Chuang and V. J. Rego).

25. High Performance Mutation Testing, *The Journal of Systems and Software*, Vol. 20, No. 2. February 1993, pp. 135-152 (with B. Choi).

26. Experiments with Program Unification on the Cray Y-MP, *Concurrency Practice and Experience*, Vol. 6(1), pp. 33-53, February 1994 (with L. Chuang and V. Rego).

27. An Empirical Comparison of Data Flow- and Mutation Based Test Adequacy Criteria, *The Journal of Software Testing, Verification, and Reliability*, Vol. 4, No. 1, March 1994, pp. 9-31 (with W. E. Wong).

28. Effect of Testing Techniques on Software Reliability Estimates Obtained Using a Time-Domain Model, *IEEE Transactions On Reliability*, Vol. 44, No. 1, March 1995, pp. 97-103 (with M. Chen and V. Rego).

29. Investigating Coverage-Reliability Relationship and Sensitivity of Reliability Estimates to Errors in the Operational Profile, in Computer Science and Informatics Journal - Special Issue on Software Engineering, Vol. 25, NO. 3, pp 4-16, September 1995 (with Mei-Hwa Chen, Praerit Garg, and Vernon J. Rego)

30. Fault Detection Effectiveness of Mutation and Data Flow Testing, *Software Quality Journal*, Vol. 4, 1995, pp. 69-83 (with W. E. Wong).

31. Some Critical Remarks on a Hierarchy of the Fault-Detecting Ability of Test Methods, *Correspondence in IEEE Transactions on Software Engineering*, Vol. 21, No. 10, pp 858-861, October 1995 (with R. A. DeMillo and W. E. Wong).

32. Reducing the Cost of Mutation Testing: An Empirical Study, *The Journal of Systems and Software*, Vol. 31, No. 3, December 1995, pp 185-196 (with W. E. Wong).

33. Effect of Test Set Minimization on Fault Detection Effectiveness, *Software Practice and Experience*, Volume 28, Issue 4, pp. 347-370, 1998 (with J. R. Horgan and Eric Wong).

34. Test Set Size Minimization and Fault Detection Effectiveness: A Case Study in a Space Application, *Journal of Systems and Software, Volumn 48, Number 2, pp 79-89, October 1999* (with J. R. Horgan and Eric Wong).

35. Interface Mutation: An Approach for Integration Testing, *IEEE Transactions on Software Engineering*, Vol. 27, No. 3, March 2001 (with Jose Maldonado and Marcio Delamaro).

36. An iterative relaxation technique to generate test data for path testing, *submitted August 2000* (with Neelam Gupta and Mary Lou Soffa).

37. An Empirical evaluation of Interface Mutation, Journal of Empirical Software Engineering, 6(2), pp 111-142, June 2001 (with Marcio Delamaro, Jose Maldonado, and Alberto Pasquini).

38. Effect of code coverage on software reliability measurements, *IEEE Transactions on Reliability*, (with Mei-Hwa Chen, Eric Wong, Michael Lyu, and Vernon Rego).[3]

39. Interface Mutation, *Journal of Software, Testing, Verification and Reliability*, Volume 11, Issue 4, 2001, pp 227-247 (with S. Ghosh).

40. Testing for Software Vulnerability Using Environment Perturbation. *Quality and Reliability Engineering International*, Volume 18, Issue 3, Special Issue: Secure, Reliable Computer and Network Systems, pp 261-272, 2002 (with Wenliang Du). *This is a revised version of conference paper # 125*.

41. A Formal Model of the Software Test Process, *IEEE Transactions on Software Engineering*, Vol. 28, No. 8, pp. 782-796, August 2002 (with Joao Cangussu and Ray DeCarlo).

42. Digital Device Manuals for the Management of Connected Spaces, *IEEE Communications Magazine*, August 2002, Vol. 40, No. 8, 2002, pp. 78-85 (with Baskar Sridharan and Steven G.. Unger).

43. Using Sensitivity Analysis to validate a State Variable Model of the Software Test Process, *IEEE Transactions on Software Engineering*, Vol. 29, No. 5, pp 430-443, May 2003 (with Joao Cangussu and Ray DeCarlo).

44. A control-theoretic approach to the management of the software system test phase, Journal of Software and Systems, Volume 79, Issue 11, November 2006, Pages 1486-1503 (with Scott MIller, Raymond DeCarlo, and Joao Cangussu).

[3]This paper had five authors at the time it was accepted for publication. At the time of printing, the authors were informed that IEEE Trans. on Reliability allows at most three authors for each publication. I decided to withdraw my name from the list of authors in favor of junior authors. Note that the theory in this paper was developed at Purdue by Chen, Mathur and Rego while Chen was completing her doctoral work at Purdue. This theory also appears in Chen's doctoral dissertation completed at Purdue under joint advisement of Rego and Mathur.

45. Masood Ammar, Arif Ghafoor, Aditya Mathur, "Conformance Testing of Temporal Role-Based Access Control Systems," IEEE Transactions on Dependable and Secure Computing, 21 Jul. 2008. IEEE computer Society Digital Library. IEEE Computer Society, (http://doi.ieeecomputersociety.org/10.1109/TDSC.2008.41).

46. Masood, Ammar; Bhatti, Rafae; Ghafoor, Arif; Mathur, Aditya P., "Scalable and Effective Test Generation for Role-Based Access Control Systems," IEEE Transactions on Software Engineering, Volume 35, Issue 5, Sept.-Oct. 2009, Page(s):654 - 668

47. Yi Fang, Luo Si, Aditya Mathur."Discriminative Graphical Models for Faculty Homepage Discovery". Journal of Information Retrieval. Volume 13, Issue 6, December 2010, pp 618-635.

48. Fault Coverage of Constrained Random Test Selection for Access Control: A Formal Analysis, Journal of Systems and Software (with Ammar Masood and Arif Ghafoor). Volume 83, Issue 12, December 2010, Pages 2607-2617.

49. Yi Fang, Luo Si, Aditya Mathur. "Discriminative Probabilistic Models for Expert Search in Heterogeneous Information Sources." In Information Retrieval, Springer, 2010.

50. Yi Fang, Luo Si, Aditya Mathur. "Ranking Expertise Information in Heterogeneous Information Sources with Discriminative Probabilistic Models," Journal of Information Retrieval. Volume 14, Issue 2, 201, April 2011, pp 158–177.

51. Yi Fang, Naveen Somasundaram, Luo Si, Jeongwoo Ko, Aditya P. Mathur: "Analysis of an expert search query log" SIGIR 2011: 1189-1190.

52. W. Eric Wong, Antonia Bertolino, Vidroha Debroy, Aditya P. Mathur, Jeff Offutt, Mladen A. Vouk: "Teaching software testing: Experiences, lessons learned and the path forward." CSEE&T, pp 530-534, 2011.

53. Fevzi Belli, Mutlu Beyazit, Aditya P. Mathur, Nimal Nissanke: "Modeling, Analysis, and Testing of System Vulnerabilities." Advances in Computers 84: 39-92 (2012)

54. Hai Hu, Chang-Hai Jiang, Kai-Yuan Cai, Aditya Mathur, and W. Eric Wong. "Enhancing Software Reliability Estimates using Modified Adaptive Testing," Information & Software Technology 55(2): 288-300, 2013.

55. Giedre Sabaliauskaite, Geok See Ng, Justin Ruths, Aditya Mathur, "A comprehensive approach, and a case study, for conducting attack detection experiments in Cyber?Physical Systems, Robotics and Autonomous Systems, Volume 98, December 2017, 174-191.

56. Siddhant Srivastava, Sridhar Adepu, and Aditya Mathur. "Design and Assessment of an Orthogonal Defense Mechanism for a Water Treatment Facility. "Robotics and Autonomous Systems," Volume 101, pp 114-125, 2018.

57. S. Adepu and A. Mathur, "Distributed Attack Detection in a Water Treatment Plant: Method and Case Study," IEEE Transactions on Dependable and Secure Computing, vol 18, No. 1, pp 86-99. 2021.

58. Venkata Reddy Palleti, Vishrut Kumar Mishra and Aditya Mathur. "A Modeling Framework for Critical Infrastructure and its Application in Detecting Cyber-Attacks on a Water Distribution System," International Journal of Critical Infrastructure Protection, V.26, September 2019.

59. S. Adepu and A. Mathur. "Assessing the Effectiveness of Attack Detection at a Hackfest on Industrial Control Systems," IEEE Transactions on Sustainable Computing, 2018, doi=10.1109/TSUSC.2018.2878597, ISSN=2377-3782 (Early Access; published in journal in 2021, see entry below).

60. H. Pei, K. Cai, B. Yin, A. P. Mathur and M. Xie, "Dynamic Random Testing: Technique and Experimental Evaluation," in IEEE Transactions on Reliability. doi: 10.1109/TR.2019.2911593 URL:http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8721158&isnumber=4378406

61. Aung Maw, Sridhar Adepu, Aditya Mathur, "ICS-BlockOpS: Blockchain for operational data security in industrial control system, " Pervasive Mob. Comput. 59 (2019)

62. Gayathri Sugumar, Aditya Mathur, "A method for testing distributed anomaly detectors, " Int. J. Crit. Infrastructure Prot. 27 (2019)

63. Vishrut Kumar Mishra, Venkata Reddy Palleti, Aditya Mathur, "A modeling framework for critical infrastructure and its application in detecting cyber-attacks on a water distribution system," Int. J. Crit. Infrastructure Prot. 26 (2019)

64. Sridhar Adepu, Nandha Kumar Kandasamy, Jianying Zhou, and Aditya Mathur, "Attacks on smart grid: power supply interruption and malicious power generation," Int. J. Inf. Sec. 19(2): 189-211 (2020)

65. Muhammad Azmi Umer, Aditya Mathur, Khurum Nazir Junejo, Sridhar Adepu: "Generating invariants using design and data-centric approaches for distributed attack detection," Int. J. Crit. Infrastructure Prot. 28: 100341 (2020)

66. Venkata Reddy, Mujeeb Chuadhary, Vishrut Mishra, and Aditya Mathur, "Can Replay Attacks Designed to Steal Water from Water Distribution Systems Remain

Undetected?", ACM Transactions on Cyber-Physical Systems, (accepted for publication), 2020.

67. Mujeeb Chuadhry, Martin Ochoa, and Aditya Mathur, NoiSense Print: Detecting Data Integrity Attacks on Sensor Measurements using Hardware based Fingerprints," ACM Transactions on Privacy and Security (accepted for publication), 2020.

68. "Gauthama Raman Mani Iyer Ramani, Wenjie Dong.], and Aditya Mathur, "Deep Autoencoders as Anomaly Detectors: Method and Case Study in a Distributed Water Treatment Plant," Computers & Security, Volume 99, December 2020, 102055.

69. "Distributed Attack Detection in a Water Treatment Plant: Method and Case Study", Sridhar Adepu and Aditya Mathur, IEEE Transactions on Dependable and Secure Computing Publication Date: JANUARY/FEBRUARY 2021, Volume: 18, Issue: 1, pp. 86-99.

REFEREED CONFERENCE/WORKSHOP PROCEEDINGS [4]

1978

70. Railway Yard Design Using Digital Simulation, *Proceedings of SIMSIG Winter Simulation Conference*, Canberra, Australia, 1978.

1986 [3]

71. Program Testing on a Massively Parallel Transputer Based System, *Proceedings of the ISMM International Symposium on Mini and Microcomputers and their Applications*, Acta Press, Anaheim, 1986, pp 67-71 (with E. W. Krauser.)

72. The Simulation of Multiple Transputer Systems, *Proceedings of the ISMM International Symposium on Mini and Micro Computer Applications*, Acta Press, Anaheim, 1986, pp 63-66 (with G. Sullivan, G. T. Li and S. Crawford.)

73. *Some Problems and Solutions in the Design of a Reconfigurable Transputer Based Multiprocessor, *Proceedings of the ISMM International Symposium on Mini and Microcomputers and their Applications*, Acta Press, Anaheim, 1986, pp 1-5 (with K. Wenming.)

1987 [1]

[4] Publications marked with an asterisk (*) are preliminary versions of those submitted subsequently for publication in journals.

74. Design of a Dynamically Reconfigurable Keyboard, *Proceedings of the International Conference on Chinese and Oriental Language Computing*, IEEE Computer Society, 1987, pp 20-23 (with F. Fowler),

1988 [7]

75. Parallel Parsing on a Transputer Network, *Proceedings of the International Conference on Parallel Processing for Computer Vision and Display*[5], 1988 (with W. B. Ligon III.)

76. Modeling Mutation on a Vector Processor, *Proceedings of the International Conference on Software Engineering*, IEEE Computer Society, 1988, pp 154-161 (with E. W. Krauser.)

77. Exploiting Parallelism for Real Time Control of a Flexible Robot, *Proceedings of the Manufacturing International 88*, The American Society of Mechanical Engineers, 1988, pp 57-61 (with R. R. Murphy and A. Grover.)

78. Inducing Vectorization: A Formal Analysis, *Proceedings of the Third International Conference on Supercomputing*, International Supercomputing Institute Inc., 1988, pp 455-463 (with E. Galiano.)

79. *High Performance Testing On SIMD Machines, *Proceedings of the Second Workshop on Software testing, Verification and Analysis*, IEEE Computer Society Press, 1988, pp 171-177 (with E. W. Krauser and V. J. Rego). Workshop

80. Parallel Models in Software Life Cycle, in *Empirical Foundations of Information and Software Science V*, Plenum Press, Ed. Pranas Zunde and Dan Hocking, 1988, pp 65-79.

81. *Exploiting Parallelism Across Program Execution: A Unification Technique and Its Analysis, *Proceedings of the International Seminar on Performance of Distributed and Parallel Systems*, North-Holland, Kyoto, Japan, December 7-9, 1988, pp 397-412 (with V. J. Rego.)

1989 [3]

82. The Mothra Tool Set, *Proceedings of Hawaii International Conference on System Sciences*, Kailua-Kona, Hawaii, 1989, pp 257-284 (with B. J. Choi, R. A. DeMillo, E. W. Krauser, R. J. Martin, A. J. Offutt, H. Pan, and E.H. Spafford.)

83. Experience with **PMothra**: A Tool for Mutation Based Testing on the Hypercube, *Proceedings of the Workshop on Experiences with Building Distributed and Mul-*

[5]This paper was presented during the conference. However, due to restrictions on the total number of pages that could appear in the proceedings, it did not appear in the final printed proceedings.

tiprocessor Systems, USENIX Association, 1989, pp 237-253 (with B. J. Choi.)

Workshop

84. Scheduling Mutants for Execution on a Hypercube, *Proceedings of Software Testing, Analysis, and Verification Symposium*, ACM Press, 1989, pp 58-65 (with B. J. Choi and B. Pattison.)

1990 [3]

85. Mutant Unification: A New Method for Mutation Based Testing On SIMD Machines, *Proceedings of the Third International Workshop, Software Engineering and its Applications*, EC2-Dèpôt lègal, 1990, pp 749-762 (with E. W. Krauser and V. J. Rego.) Workshop

86. Performance Evaluation of a Mutant Unification Algorithm, *Proceedings of the Fifth International Symposium on Computer and Information Sciences, ISCIS V*, İstanbul Teknik Üniversitesi, 1990, pp 211-221 (with V. J. Rego.)

87. Software and Hardware Quality Assurance: Towards A Common Platform for High Reliability, Conference Record, IEEE International Conference on Communications, ICC Part 4(of 4), Atlanta, GA, April 1990, pp 1324-1328 (with R. J. Martin.)

1991 [6]

88. Concurrent Stochastic Simulations: Experiments with Unification *Proceedings of Supercomputing Symposium '91*, University of New Brunswick Press, Fredricton, Canada, 1991, pp 139-150, (with V. J. Rego and L. Chuang.)

89. Compiler Integrated Program Mutation *Proceedings of COMPSAC '91*, IEEE Computer Society Press, 1991, pp 351-356 (with R. A. DeMillo and E. W. Krauser.)

90. On the Relative Strengths of Data Flow and Mutation Testing, *Proceedings of the Ninth Annual Pacific Northwest Software Quality Conference*, Pacific Agenda, pp 165-181, 1991.

91. Compiler Support for Program Testing on MIMD Architectures, *Proceedings of the Ninth Annual Pacific Northwest Software Quality Conference*, Pacific Agenda, 1991, pp 221-234 (with R. A. DeMillo and E. W. Krauser.)

92. A Family of White-Box Models for Estimating Software Reliability, Fourteenth Minnowbrook Workshop on Software Engineering, Blue Mountain Lake, NY, July 23-26, 1991, pp 80-81 (with J. R. Horgan, M. H. Chen, V. J. Rego.) Workshop

93. Performance, Effectiveness, and Reliability Issues in Software Testing, *Proceedings of COMPSAC '91*, IEEE Computer Society Press, 1991, pp 604-605.

1992 [3]

94. Experience in Using Three Testing Tools for Research and Education in Software Engineering, *Proceedings of the Symposium on Assessment of Quality Software Development Tools*, IEEE Computer Society Press, New Orleans, LA, May 1992, pp 128-143 (with J. R. Horgan.)

95. Effect of Testing Techniques on Software Reliability Estimates Obtained Using Time Domain Models, *Proceedings of the 10th Annual Software Reliability Symposium*, IEEE Reliability Society, Denver, Colorado, June 25-26, 1992, pp. 116-123, (with M. H. Chen and V. J. Rego.)

96. Experiments with Program Unification on the Cray Y-MP, *Proceedings of the International Conference on Parallel and Distributed Systems (ICPADS'92)*, Hsinchu, Taiwan, December 1992, pp 433-440, (with L. Chuang and V. J. Rego)

1993 [3]

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179. SecWater: A Multi-Layer Security Framework for Water Treatment Plants, CysWater 2017, Pittsburgh, April 21, 2017. Workshop

180. WaterJam: An Experimental case study of Jamming Attacks on a Water Treatment System, The 2017 IEEE International Workshop on Safety and Security in Cyber-Physical Systems SSCPS 2017 in conjunction with QRS 2017 Prague, Czech Republic, July 25-29, 2017 (to appear) (with **Jayprakash** and Sridhar Adepu). Workshop

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on Software Quality, Reliability and Security, July 25-29, 2017 (with **Gayathri Sukumar**). Workshop

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192. "Scanning the Cycle: Timing-based Authentication on PLCs," Chuadhry Mujeeb Ahmed, Martin Ochoa, Jianying ZHOU, and Aditya Mathur, accepted for publication in ACM ASIACCS 2021 (20% acceptance rate).

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195. Jhansi Yard Simulation Study, Report No. 1/76/6, Operations Research Cell, Railway Board, Government of India, New Delhi, 1976.

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200. The Mothra Mutation Analysis Software Testing Environment, (with R. A. DeMillo, E. W. Krauser, R. J. Martin, and E. Spafford), *IEEE Software*, 1990, p 56.

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202. On the Impact of Microchips on Music, EEE Magazine, Second Semester, 1993, BITS Pilani, India.

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207. Software Engineering for Secure Software - State of the Art, joint CERIAS/SERC Technical Report, September 2005, (with K. Jayaram).

208. Modeling and Simulation of the Auditory Pathway Technical Report: SERC-TR-287. 3/1/2007 (with Alok Bakshi).

209. Adequacy of Statecharts as a Source of Tests for Implementations of Cryptographic Protocols Technical Report SERC-TR-288. 4/27/2007 (with K. Jayaram).

210. Integrating Model Checking and Test Generation for Reliable and Secure Concurrent Programs Technical Report SERC-TR-292. 4/1/2008 (with Daniel Tang).

211. FacFinder: Search for Expertise in Academic Institutions. Technical Report: SERC-TR-294. 10/20/2008 (with Yi Fang and Luo Si).

WORK RELATED TO MUSIC AND SOUNDS

My interest in music has led me to investigate (a) formal means to construct new forms of tonal music and (b) use of sounds and music in program understanding and composition. I have two publications in this area [109,114]. I have supervised Master's theses by David Boardman (1994), Vivek Khandelwal (1995), M.C. Gopinath (2004), and R. Jagadish Prasath (2004) that relate to my research in music and sounds. In addition I have composed about 45 pieces in various styles. A list of all my compositions, and some scores, is found at:

`http://www.cs.purdue.edu/homes/apm/aditya-music/music-pages/apmMusicFrameset.htm`

My music is mostly a blend of elements of Indian and Western classical styles and instruments. For example, *Polymodal Fun on a Fibonacci Pyramid*, uses North Indian modes Khamaaj and Todi in a simultaneous rendition of two supporting melodies. This composition also changes time signatures...from 4/4 to (3+2+2)/8 and back to 4/4. *Birthday Wishes for an Aspiring Trumpeter*, uses Strings and the Indian Tabla drums. The *Welcome Song* combines the Indian Sitar with the traditionally Western Strings, French Horn, and Tuba to accompany a melody in the North Indian Rāgā Yaman Kalyana. A *Little Fantasy* written for solo piano was inspired by a North Indian classical melody in Rāgā Bhopali. The melody in the third movement of Variations on a *Theme from Brazil* changes from major mode to the North Indian mode Bhairavi and then back to major. The song *In the Bright Summer Morning* uses Bhairav, a morning rāgā. *Mhari Gayyan Khul Khul Jaye* uses a variety of western instruments to accompany a rustic melody switching between the North Indian modes Bilaval, Kalyana, and Bhairavi. Mode switching between Kalyana and Bhairavi also takes place in *Rondo for Violin and Tabla*.

TECHNICAL DISCLOSURES AND PATENTS

1. US provisional application filed 29 March 2016. U.S. Application No. 62/314,604

   Title: Water-Defense -A Method To Detect Multi-Point Cyber Attacks On Water Treatment Systems

2. US provisional application filed on 7 September 2016. US Application 10201607439T.

   Title: ARGUS: AN ORTHOGONAL DEFENSE FRAMEWORK TO PROTECT PUBLIC INFRASTRUCTURE AGAINST CYBER-PHYSICAL ATTACKS

3. A method and system for maintaining operational data security in an Industrial Control System. Patent 10201806941U; Aung Chan Thar, Primary inventor (1), Sridhar Adepu, Secondary Inventor (2), and Aditya Mathur, Secondary Inventor (3). August 16, 2018.

SOFTWARE TOOLS DEVELOPED

Software systems that I developed and/or for which I was the team leader are listed below. The year listed against each project is the year during which Version 1 of the software was available.

1. SLR(1) Parser Generating System: 1974

   Sponsor: Department of Electronics, Government of India.

   Role: Chief designer and programmer supported by two graduate students.

Use: Used commercially by DCM Data Products, India in the development of compilers for Fortran 77, a proprietary Process Control Language, and the Hi-BASIC programming language.

2. HI-BASIC Compiler (with complete runtime support): 1979

   Sponsor: DCM Data Products, India.

   Role: Chief designer and programmer supported by four undergraduate and two graduate students.

   Use: Sold commercially by DCM Data Products for their Spectrum Series of computers.

3. Pascal Compiler: 1980

   Sponsor: BITS, Pilani.

   Role: Advisory; programmed by Jishnu Mukerjee, a graduate student.

   Use: In regular use at BITS, Pilani, India, in the introductory course on programming until 1985.

4. Educational Administration System: 1985

   Sponsor: BITS, Pilani.

   Role: Chief designer and programmer; supported by three faculty and four data entry assistants.

   Use: In regular use at BITS, Pilani, India since 1985 for administering course registration, grade reporting, and several other administrative tasks.

5. ATAC enhancements: 1992/1995

   Sponsor: Bellcore, National Science Foundation, IBM.

   Role: Developed the requirements and initial design; programmed by the CS 406/407 class in 1991/92 and one graduate student in 1995.

   Use: Enhancements integrated by Bellcore into their version of ATAC in 1993/1995. ATAC has been in use in research, education, and commercial projects for the measurement of control and data flow coverage.

6. LISTEN: 1994

   Sponsor: National Science Foundation through Undergraduate REU awards.

   Role: Designer of the language LSL underlying LISTEN; first implementation by David Boardman, a graduate student and subsequently enhanced by two graduate and three undergraduate students.

   Use: Research in program auralization; the tool is in public domain; the source has been made available explicitely to two research groups.

7. TAMER: 1995

   Sponsor: Software Engineering Research Center and Purdue Research Foundation.

   Role: Advisory; programmed by Tsanchi Li, a graduate student.

   Use: Research in fault tolerance; the tool is not in public domain; delivered in 1996 to Bellcore for enhancement and use in the testing of fault-tolerant software.

8. WABASH: 1998-2000

   Sponsor: Software Engineering Research Center and Purdue Research Foundation (British Telecom, Telcordia, and Tivoli).

   Role: Advisory, design, programmed by 5 graduate and 1 undergraduate students.

   Use: Research in test and management of Internet Services. Previous version of the tool, named TDS, licensed to one company. Technology disclosure filed with PRF.

9. GAPS: 1998-2000.

   Sponsor: Department of Computer Sciences.

   Role: Designer and advisor. Programmed in Java by Matthew Baarman, a graduate student.

   Use: GAPS is intended to support graduate applications processing in the Department of Computer Sciences.

10. JListen: 2003-2004.

    Sponsor: Department of Computer Science, Purdue University and Department of Computer Science, BITS Pilani (while I was on sabbatical at BITS).

    Role: Designer and advisor. Programmed in Java by a group of undergraduate and graduate students while I was on sabbatical at BITS, Pilani, India.

    Use: Auralization of Java applications.

11. PURE/INDURE: 2006-2010.

    Sponsor: Indiana Economic Development Corporation and Office of the Vice President for Research, Purdue University.

    Role: Project lead, designer, tester.

    Use: Faculty expertise search from among faculty at Ball State University, Indiana University, Purdue University, and University of Notre Dame.

COURSES TAUGHT

Number of semesters taught is in parentheses. Since 2006 I have devoted myself to the teaching of undergraduate classes.

Undergraduate

Computers and Programming	1976-1985 (3)
Computer Programming and Organization	1985-1987 (2)
Introductory programming	1972-2013 (25)
Fortran: 1972-77	
Pascal: 1978-82	
C: 1985-1994	
Java: 2004, '08, '10, '11, ‘'19	
Python: 2013-2014	
Microprocessors	1980-1985(3)
Programming Languages	1973-1984(8)
Programming Languages and Compilers	1987-1995(11)
Senior Design Project	2001 (1)
Software Engineering	1991-03 (13)
Systems Programming	1983 (1)
Systems Simulation	1976-1980 (3)
Software Testing	2006-11 (3)

Graduate

Advanced Computer Architecture	1985-1987 (5)
Compiler Construction	1980-1985(3)
Recent Advances in Computer Science	1982 (1)
Software Engineering	1988-90 (3)
Software Testing	2005-06 (1)
Computing for Science and Engineering	2018 (1)
Cyber Physical Systems	2018-2020 (3)
(co-instructor with Professor Jianying Zhou)	

Number of semesters taught is in parentheses.

TEACHING STYLE AND INNOVATIONS

Style: Highly interactive; in class student involvement encouraged; clarity in speech and communication of simple and difficult topics; use of technology when necessary, e.g., for animation; live demonstrations; student centric; use of iClickers for in-class feedback.

Innovations: (a) Introduced the notion of "Industry Sponsored Projects" in 1991 starting

with the Software Engineering class. These projects allow students to focus on requirements analysis and design while solving an industrially relevant problem. Since its inception over 20 companies have sponsored projects in Software Engineering and Software Testing classes taught at Purdue. The students and the sponsors meet weekly either face-to-face or via video conference; the instructor manages the project and grades the students. (b) Invented the metric titled **Individual Contribution Index (ICI)** for grading team members in a projects in undergraduate courses in Software Engineering and Software Testing. (c) Introduced the basics of concurrent programming to Computer Science freshman. (d) Introduced lecture-free teaching in cohort class rooms in the Digital World course at the Singapore University of Technology and Design; this was the first course at the university to employ this highly interactive and student-centric approach.

TEACHING PERFORMANCE

Included in Top Ten Outstanding Teachers in the School of Science, 1990-91, 1991-92, 1993-94, and 1994-95. Finalist, Indiana 21st Century Outstanding Information Technology Educator, 2000.

TEACHING EVALUATIONS

At the end of each session students are asked to answer questions that help assess various aspects of the course offering. One such question pertains to the quality of the instruction provided by the instructor. This question is "Overall, I would rate this instructor as:?" and the students rate the instructor on a scale of 1 to 5 defined as follows:

[E] Excellent=5 [G] Good=4 [F] Fair=3 [P] Poor=2 [VP] Very Poor=1

The following table lists the student evaluations for courses I have taught since 1985. While I taught at BITS Pilani during 1972-1985, there were o formal student evaluations of the instructor.

Course #	Session	Score (max 5.0)
Programming Languages and Compilers		
CS 352*	Fall 88	4.5
	Fall 89-1	4.9
	Fall 89-2	4.5
	Spring 89	4.6
	Fall 90-1	4.9
	Fall 90-2	5.0
	Spring 90-1	4.7
	Spring 90-2	4.8
	Fall 92-1	4.7
	Fall 92-2	4.9
	Fall 93	4.4
	Fall 94	4.8
	Spring 95	4.9
Software Engineering		
CS 406	Fall 92	4.3
	Fall 93	4.7
	Fall 97	4.5
	Fall 98	4.8
	Fall 99	4.0
	Fall 01	4.1
CS 407	Spring 94	4.9
	Spring 98	4.8
	Spring 99	5.0
	Spring 00	4.8

Course #	Session	Score (max 5.0)
CS 490D	Spring 01	5.0
CS 490S	Fall 91	4.6
CS 490T	Spring 92	4.9
CS 510	Spring 89	4.8
	Spring 90	4.7
Software Testing		
CS 590T	Fall 05	4.8
CS 490M	Fall 06	4.9
CS 49000-020	Fall 09	4.2
CS 49000-020	Spring 2011	4.6
Programming and Problem Solving		
CS 156/158 †	Spring 96	3.7
CS 178	Fall 04	4.8
CS 190M	Fall 08	4.8
CS180**	Fall 2010	4.7
CS180**	Fall 2011	4.7
10.009***	Spring 2013	4.4
10.009***	Spring 2014	4.6
CS180**	Fall 2019	4.2
Computer Organization and Architecture		
ICS 2602	Fall 85	4.2
	Fall 86	4.2
	Winter 86	4.7
ICS 4621	Winter 86	3.9
ICS 6620	Fall 86	4.1
	Summer 86	4.5
Average over all courses		**4.59**

*Required for CS majors. **Required for CS majors. Large class (> 200 students). ***Required for ALL majors.

†Required for Engineering majors.

DOCTORAL THESES ADVISED/ADVISING

1. Byoungju Choi, co-advisor with Richard A. DeMillo, December 1990. Professor, Ewha Womans University, South Korea.
2. Edward Krauser, co-advisor with R. A. DeMillo. December 1991. Bellcore and then Sumitomo Bank, NY.
3. Eric Wong, advisor, May 1993. Associate Professor, University of Texas at Dallas, TX.
4. Mei-Hwa Chen, co-advisor with Richard A. DeMillo May 1994. Associate Professor, State University of New York, Albany, NY.
5. Tsanchi Li, advisor, August 1995 Accepted software developer position.
6. Neelam Gupta, co-adviso with Mary Lou Soffa, August 1999. (formerly) Assistant Professor, University of Arizona, Tucson, AZ.
7. Sudipto Ghosh, advisor, August 2000. Assistant Professor, Colorado State University, Fort Collins, CO.
8. Joao Cangussu, advisor, co-advisor: Raymond DeCarlo. Summer 2002. Microsoft (formerly Assistant Professor at UT Dallas).
9. Baskar Sridharan, advisor, August 2003, Microsoft, Advanced OS Group.
10. Ramkumar Natarajan, advisor, passed Ph. D. Qualifier II examination. *terminated unexpectedly*.
11. Ammar Masood, co-advisor with Professor Arif Ghafoor, December 2006. Returned to Pakistan.
12. Scott D. Miller, advisor, co-advisor: with Raymond DeCarlo, Fall 2013. Currently employed at Arxan Technologies.
13. Chuadhary Mujeeb Ahmed, December 2019. Currently a Research fellow at the Singapore University of Technology and Design [cannot move out of Singapore due to COVID-19 lockdown.
14. Gayathri Sugumar, February 2020. Currently at Bank Of America, Singapore.

DOCTORAL ADVISORY COMMITTEES (Selected)

Hiralal Agrawal, Mei-Hwa Chen, Ling-Yu Chuang, Hiram Hunt, Brian L. Stuart, Patricia Dorn (Department of Audio and Speech Sciences), Rajiv Chaudhary, Hyeran Byun, Anupam Joshi, Silvio Picano (School of Electrical Engineering, Naren Ramakrishnan,

Reuben Pasquini, Juan Gomez, Ivan Krsul, Swapna Gokhle (Duke University, 1998), Yung-Ping Chen, Yi Lu (2004). Ammar Masood (ECE, 2005).

MASTER'S THESES ADVISED

Thesis title, name, year of graduation, university, company/university.

1. Development of a Discrete Event Model of a Railway Network; Part II, K. Kant, 1975, BITS, Pilani. Director, National Informatics Center, New Delhi, India.
2. Development of a Discrete Event Model of a Railway Network; Part I, S. K. Jain, 1975, BITS, Pilani.
3. A Pascal Compiler for IBM 1130; Jishnu Mukherji, 1976, BITS, Pilani. Novell.
4. Simulation of Some Aspects of a Road Transport System; A. K. Batra, 1976, BITS, Pilani. Cisco.
5. Simulation of Control and Movement of Traffic in a Railway Subnetwork; P. K. Goel, 1976, BITS, Pilani.
6. Computer Aided Design of a University Time Table; K. Usha, 1978, BITS, Pilani.
7. Query Evaluation and Optimization in Very Large Data Bases; Joseph Kuruvilla, 1978, BITS, Pilani.
8. Performance Evaluation of a Database Management System; P. C. Chordia, 1978, BITS, Pilani.
9. Computer Network Interfacing a Multi-Microcomputer Master-Slave Configuration; R. S. Dia, 1979, BITS, Pilani.
10. A Query Language for a Relational Database; Vernon Rego, 1979, BITS, Pilani. Professor, Purdue University.
11. Code Generation in a Fortran-77 Compiler for a Microcomputer, Anant S. Senapati, 1984, BITS, Pilani.
12. Parser and Code Generator for a Devanagari Based Programming Language; Ravi Kant, 1984, BITS, Pilani.
13. Artificial and Natural language Interface to Databases; Anil K. Sharma, 1984, BITS, Pilani.
14. Implementation of an Interactive Parser Generation System, S. Goel, 1984, BITS, Pilani.

15. LISTEN: A System for Program Auralization; David Boardman, 1994, Purdue University.
16. On Program Auralization; Vivek Khandelwal, 1995, Purdue University. Nortel Networks.
17. On Code Coverage and Software Reliability; Praerit Garg, 1995. Purdue University. Microsoft.
18. Software Reliability: A Component-based Approach, Saileshwar Krishnamurthy, Purdue University, August 1997. IBM.
19. CBRE: Un Metodo per la Misura dell'Affidabilità; Pietro Michielan, University of Padova, Italy, December 1997.
20. Misura dell'Affidabilità del Software il Mtodo di Laprie e Kanoun, Manuela Schiona, University of Padova, Italy, December 1997.
21. Auralization of Intrusion Detection System using JListen, M. C. Gopinath, Birla Institute of Technology and Science, Pilani, India, 2004. HCL India. (This work resulted from my sabbatical at BITS Pilani.)
22. Auralization of Web Server Using JListen; R. Jagadish Prasath, Birla Institute of Technology and Science, Pilani, India, 2004. WIPRO, India. (This work resulted from my sabbatical at BITS Pilani.)
23. Modeling the Auditory Pathway, Johannes Cilliars, May 2009.
24. Software product feature ideation; Karthikeyan Rajasekharan, summer 2013.
25. iDatify; Kushal Lakhotia, co-advisor with Vernon Rego; graduated in summer 2013 without completing an MS thesis.

MASTER's THESES COMMITTEES

Kumar Brahnmath (CS), Nathanial Nystrom (CS), Chao-Lung Yang (2004, IE).

UNDERGRADUATE STUDENTS ADVISED

I have not kept track. From 1973-1985 I have advised over 50 undergraduate students on various research and development projects. During 1982-84 I advised about 20 undergraduate students who helped develop the first multi-lingual computer in India. Since 1985 I have advised about 2-3 undergraduate students each year. Most of these students have been supported through NSF REU or other NSF and industrial grants.

PROFESSIONAL LECTURES

1. *Spoonerisms*, Mathematics society, BITS, Pilani, 1973.
2. *Mathematics, Computers, and Industry: A Relational Perspective*, Invited Talk, Annual Convention of Indian Mathematical Society at Bombay, India, 1973.
3. *Administering an Injection of Intelligence*, Symposium on Microprocessor Based Systems at Central Electronics Engineering Research Institute at Pilani, 1983.
4. *Keynote address*, Seminar/workshop conducted by National Institute of Information Technology at New Delhi, 1984.
5. *Towards A Truly Multi-lingual Computer*, Georgia Institute of Technology, Atlanta, Georgia, April 1986.
6. *Vectorization Over Multiple Program and Data Sets*, Georgia Institute of Technology, Atlanta, Georgia, April 1987.
7. *High Performance Testing Using Parallel Machines*, Racal-Milgo, Ft. Lauderdale, Florida, 1988.
8. *High Performance Testing of Software Systems*, Bell Communications Research, Piscataway, New Jersey, May, 1988.
9. *Software Engineering Research and Education*, Birla Institute of Technology and Science, Pilani, India, December 27, 1989.
10. *Performance In Software Testing,* Department of Computer Science, Portland State University, Oregon, October 11, 1989.
11. *Performance Issues in Software Testing for High Reliability*, Computer Sciences Corporation, Moorestown, PA, March, 1990.
12. *High Performance Software Testing*, Iowa State University, April 1990.
13. *Automatic Fault Monitoring and Classification,* Bell Communications Research, April 1991.
14. *Comparing the Effectiveness of Data Flow and Mutation Testing*, Quality Week 1991, San Francisco, May 1991.
15. *Software Testing for High Reliability*, at Intel Corporation, Sun Microsystems, and Computer Associates during May 1991.
16. *New Approaches to Software Reliability Modelling*, AT&T, Naperville, September 1991.

17. *Reliability Modelling*, Northrop Electronic Systems Division, Chicago, September 1991.

18. *Software Testing for High Reliability*, at Computer Science Department, Ball State University, February 1992.

19. *An Overview of Recent Research in Software Testing and Reliability*, Grambling State University, Grambling, LA, May, 1992.

20. *Experience with ATAC in Software Engineering Research and Education at Purdue*, Bell Communications Research, Piscataway, NJ, June, 1992.

21. *Integration Testing*, Bellcore, Morristown, NJ, January, 1993.

22. *Testing Via Interfaces*, Bell Northern Research, Research Triangle Park, NC, January, 1993.

23. *Testing Fault Tolerant Systems*, Siemens Corporate Research, Princeton, NJ, January 1994.

24. *Testing Fault Tolerant Systems*, Bell Communications Research, Morristown, NJ, January 1994.

25. *Testing Fault Tolerant Systems*, Harris Corporation, Melbourne, FL, February 1994.

26. *Software Reliability Estimation*, Hughes Network Systems, Germantown, MD, March 1994.

27. *New Approaches to Software Reliability Estimation*, University of Padova, Padova, Italy, May 1994, Ansaldo, Naples, XCItaly, June 1994, and IBM Labs. Toronto, Canada, July 1994.

28. *Software Testing and Reliability*, half day seminar at Center for Development of Telematics (CDOT), New Delhi, India, December 1994.

29. *Software Testing*, half day tutorial, International Conference on Software Testing, Reliability, and Quality Assurance, New Delhi, India, December 19-22, 1994.

30. *Testing fault tolerant systems*, Harris Corporation, Melbourne, Florida, March, 1995.

31. *New approaches to software reliability modelling*, University of Campinas, Campinas and University of Sao Paulo at Sao Carlos, Brazil, July 1995.

32. *On the importance of coverage in software testing*, Tandem Computers, August 1995.

33. *Quantification of software quality through coverage measures*, Microsoft Corporation, August 1995.

34. *Software architecture based testing and reliability estimation*, Northrop Electronic Systems Division, October 1995.

35. *Architecture-based software reliability estimation*, Hughes Network Systems, March 1996.

36. *New trends on software quality achievement during software development, with emphasis on testing and reliability*, Invited talk at the Seventh International Conference on Software Technology: Software Quality, Curitiba, Brazil, June 1996.

37. *Reliability, availability, and security: An integrated view*, invited talk at Motorola and Northern Telecom, February 1997.

38. *Testing Distributed Systems*, invited talk at Motorola and Software Artistry, 1998.

39. *Software Capsules: A Mantra for Global Supremacy in Software*, Indian Institute of Science and National Institute of Advanced Studies, Bangalore, India, August 1998.

40. *Coverage Principle: A Mantra for Software Testing and Reliability*, Cadence Corporation, Distinguished Speaker Program, August 1998.

41. *Testing distributed Systems*, Microsoft, June 1999 and Invited lecture to Software Engineering class at Ball State University, Muncie, July 1999.

42. *Test and management of distributed systems*, Invited Talk, British Telecom, Martlesham, UK, and Tivoli, Rome, Italy, July 1999.

43. *Testing, Monitoring, and Control of Distributed Objects*, Invited talk in Cellular Subscriber Testing Symposium, Motorola, Schaumberg, November 9, 1999.

44. *Testing, Monitoring, and Control of Internet Services*, Distinguished speaker at Washington State University, Pullman, April 2000.

45. *Test and Management of Internet Services*, Hewlett Packard at Palo Alto, July 5, 2000, Design2Deploy at Mountain View on July 6, 2000, and British Telecom at Ipswich (UK) on July 18, 2000.

46. *Monitoring SmartHomes*, British Telecom, Ipswich (UK), July 23, 2001.

47. *Newton's law in Software Development Processes ?*, Distinguished Speaker, Center for Advanced Computing Studies, University of Louisiana, Lafayette, LA, February 1, 2002.

48. Keynote address: "Success Mantras for IT Industry in the Next Decade," at Rakshapal Bahadur Management Institute, Bareilly, India, October 11, 2003.

49. *Newton's law in Software Development Processes ?* October 27, 2003 at IIT Delhi and November 10, 2003 at IIT Kanpur, India.

50. *Feedback control of software processes: Progress and Problems*, December 2004, Beijing University of Aeronautics and Astronautics, Beijing, China.

51. *Software Cybernetics: Progress and Challenges*, December 20, 2004, University of Paderborn, Germany.

52. *Why the existing theory of software reliability must be discarded..and what should replace it?*, Reliability Group, Microsoft, Redmond, July 26, 2006.

53. Keynote address: *Saturation effect and the need for a new theory of software reliability*, The 2nd IEEE International Symposium on Dependable, Autonomic and Secure Computing (DASC'06).

54. Invited talk: *Why the existing theory of software reliability must be discarded..and what should replace it ?*, University of Sao Paulo, Sao Carlos, Brazil. February 6, 2007.

55. Next Generation Keynote: Software Cybernetics: The Next Frontier, Society for Design and Process Science, Transformative Systems Conference, Dallas, June 6-11, 2010.

56. Capsules, Micro-payments, and the Democratization of Cloud Computing, Behang University of Aeronautics ad Astronautics, Beijing, China, January 5, 2011.

57. Keynote Address: Quantifying the Security of Cyber Physical Systems, Pacific Rim Dependable Computing (PRDC), November 19, 2014, Singapore.

58. Designing Safe and Secure Cyber Physical Systems, GovWare 2014, Singapore, September 28, 2014.

59. Keynote Address: Designing Safe and Secure Cyber Physical Systems: Challenges in Defense and Testing ICTeR 2014, Colombo, Sri Lanka, December 10, 2014.

60. Design of Secure Cyber Physical Systems, Insights, London, UK, May 13, 2015.

61. Design of Secure Cyber Physical Systems, Hague Security Delta, Hackershub, Den Haag, The Netherlands, May 18, 2015.

62. Cyber Security Research at SUTD, TNO, Den Haag, The Netherlands, May 18, 2015 [Morning].

63. Quantifying the Security of Cyber Physical Systems, Delft University of Technology, Delft, The Netherlands, May 19, 2015 [Evening].

64. Detecting Cyber and Physical Attacks on Water Treatment Systems: A Physics-Based Approach, Industrial Control Systems Joint Working Group, Minneapolis, April 12, 2017.

65. Secure Critical Infrastructure, Distinguished Seminar Research talk, Missouri University of Science and Technology, May 1, 2017.

Editorial Board

Software Testing Verification and Reliability Editorial Board, John Wiley and Sons, Ltd.

Software Engineering: An International Journal, Department of Computer Engineering Delhi Technological University, Bawana, Delhi-110042, India

Referee

National Science Foundation, ACM Transactions On Software Engineering Methodology, IEEE Transactions on Computers, IEEE Transactions on Software Engineering, Information Science, IEEE Software, Journal of the Association of Computing Machinery, Journal of Parallel and Distributed Computing , Performance Evaluation, Software Practice and Experience, Journal of Computer and Software Engineering, and numerous conferences.

RESEARCH FUNDING

Unless mentioned otherwise, I am, or was the Principal Investigator in all grants listed below.

1. An SLR(1) Parser Generating System[7] Department of Electronics, Government of India, No. 2(129)/81-TDID, (Indian Rupees) 125,000, 1974.

2. Simulation of Railway Marshalling Yard, Railway Board, Unlimited travel support, Government of India, 1976.

3. Simulation of Train Movement in a Double Line Section with a Single Line Bridge in-between, Railway Board, Government of India, Unlimited travel support, 1976.

[7]This project was originally carried out on the IBM 1130 computer without any external support. Subsequently, the Electronics Commission awarded money for an enhancement of this project. See the Data Base project in item 9.

4. Design and Development of a Compiler for Hi-Basic Language, DCM Data Products, India, DP:R&D:AK:102/2527, (Indian Rupees), 60,000, 1979.

5. Development of Software and Hardware for Devanagari Based Information Processing System, Department of Electronics, Government of India, No. 2(49)/80-TDID (Indian Rupees) 296,000, 1980.

6. Enhancement grant for the project Development of Software and Hardware for Devanagari Based Information Processing System, Department of Electronics, Government of India, No. 2(49)/80-TDID/148, (Indian Rupees) 125,000, 1981.

7. Development of Video Courses on Microprocessors, Department of Electronics, Government of India, No. 2(124)/81-TDID, (Indian Rupees), 212,400, 1982.

8. Enhancement grant for the project Development of Video Courses on Microprocessors, Department of Electronics, Government of India, No. 2(124)/81-TDID/224, (Indian Rupees), 140,000, 1982.

9. Development of Data Base Management System and Software Tools to Aid in Education and Design of System and Application Software, Electronics Commission, No. 2(129)/81-TDID, (Indian Rupees) 1,321,200, 1982. (Co-PI with Professor Praveen Dhyani).

10. Devanagari Computer for Demonstration and Use during Third World Hindi Convention, Department of Electronics, Government of India, No. 2(144)/82-TDID/244, (Indian Rupees) 275,000, 1984.

11. Development of a Transputer Network Simulator, Inmos, $5,000, 1986.

12. Program Mutation for SDI Applications (Faculty Associate with R. A. DeMillo as the PI), RADC F 30602-85-C-0255, $388,670, 1987.

13. Use of Fifth Generation Computers for High Performance Reliable Software Testing, Software Engineering Research Center, $43,000, 1988.

14. Cochlear Emissions and Psychoacoustic Microstructure, (Co-PI with Arnold Tubis and Glennis Long) NIH 2 R01 NS22095-04A1, $9,508, 1989.

15. Compiler Integrated Testing, Software Engineering Research Center, $28,000, 1989.

16. Enhancement of a Wide Spectrum Tool for Software Testing, NSF ECD-8913133, $20,000, 1990.

17. Faculty Research Program, Bellcore-6711469, $9,479, 1990.

18. Faculty Research Program, NSF, ECD-8913133, $9,479, 1990.

19. Compiler Integrated Testing (Renewal), Software Engineering Research Center, $10,433, 1990.

20. Design and Implementation of a Program Unification Tool, NSF Award: 9002225, $128,094, 1990 (Co-PI with V. J. Rego).

21. Effectiveness and Performance in Software Testing, NSF Award: 9102311 (with V. J. Rego as Co-PI), $226,006, 1991.

22. Documentation and Enhancement of a Data Flow Testing Tool for Use in Software Engineering Education, Educational Supplement for the existing grant "Effectiveness and Performance in Software Testing", NSF, $22,237, Grant No. CCR-9102311, (Co PI: Vernon Rego), 1992.

23. Effectiveness of Constrained Mutation, Purdue Research Foundation 1992 PRF Research Grant, $9,900.

24. United Nations Training Programme (UNDP), Training fees, September 1992, $1,000.

25. Educational supplement to grant in item 21 above (NSF), $22,402, August 1993.

26. Testing Fault-Tolerant Software Systems, 1994 PRF Research Grant, $10,200 (Co-PI: R. A. DeMillo).

27. A Synthesis of Coverage Testing and Modelling in Software Reliability Estimation, National Science Foundation, $120,000, NSF Award: 9311862 (Co-PI's: J. Berger, R. A. DeMillo, and V. J Rego) August 1994-July 1997.

28. Virtual SERC, $113,218, NSF Award: 9528527, Co-PI: Buster Dunsmore, 1995-96.

29. Software Reliability and Testing, IBM Toronto Laboratories, Canada, $100,000 and summer support for one graduate student at IBM Toronto Labs, 1994-1997.

30. Software Reusability, SERC grant, $27,000, 1997-98.

31. Virtual SERC, PI, NSF Award: 9705332, $55,000, 1997-98.

32. Component-based estimation of software reliability, NSF Grant, $50,000, 1997-99. NSF Tie Project with the Center for Advanced Computers and Communications, Duke University.

33. Software Engineering Re-training (SERT) program, Raytheon Technical Services, $300,000 (with Buster Dunsmore), summer 1998.

34. Software Engineering Research Center, PI, NSF, $35,000, 1998-99.

35. Testing Distributed Systems, gift from Motorola, $10,000, 1998-99.

36. Value-Based Software Engineering for Small Business, $240,000, NSF Award No.: 9905789, 1999-2001, CO-PIs: David Raffo, Stuart Faulk, and Robert R. Harmon.

37. Testing Distributed Systems, Internet 2 project, PI, NSF grant, $125,000, 1999-2001.

38. Software Engineering Research Center, PI, NSF Award: 9908659, Center Renewal grant, $100,000, 1999-2001.

39. Testing Distributed Systems, SERC (Telcordia and Tivoli), $50,000, 1999-2000.

40. Management of Smart Homes, SERC (Telcordia), $25,000, 2000-2001.

41. Management of Smart Homes, SERC (British Telecom), $25,000, 2000-2001.

42. Mutation 2000: Mutation Testing in the Twentieth and the Twenty First Century, PI, NSF, $13,315; Year 2000.

43. : Monitoring and Control of Next Generation Systems, PI, NSF Award, $25,000, 2002-2004.

44. Monitoring and Control of the Test Process, Guidant Corporation/SERC, $30,000, 2003-2004.

45. Discovery-to-delivery of pharmaceuticals: Safely efficiently using advanced analytical techniques, 21st Century Research and Technology Fund, (Co-PI) $58,389, 2004-06.

46. Tools for quantifying software vulnerability and protection: A Science and Technology Arxan Technologies/21STC.R&T Fund, PI (Purdue)$141,962, 2004-06.

47. Computational models for the study of hearing and language impairment in children, PI, NSF, $120,911. 2005–06.

48. Locating and testing insecure paths in implementations of cryptographic protocols, PI, Army Research Lab, $52,501. 2006–07.

49. Development, Deployment, & Maintenance of the Indiana Database for University Research Expertise, PI, Indiana Economic Development Council, INC, $105,000. March 31, 2008–July 31, 2008. Co-PI: Luo Si.

50. INDURE enhancement award. $45,000, Office of the Vice President for Research, Purdue University.

51. Expertise Search in Information Network, Google Research Award Program, $65,000 (joint with Luo Si), July 2010.

52. SBAHQ 11 G 0032 FAST Award. $100,000 (in collaboration with Karl Koehler, Indiana 21st Century Research and Technology Fund, and Professor Luo Si). January 2012-December 2013.

Grants obtained while at the Singapore University of Technology and Design (SUTD).

53. Startup grant SRG ISTD 2012 034 from Singapore University of Technology and Design. S$200,000. June 2012-May 2015.

54. Project GREaT (Games Research, Education and Training): Manpower Development Authority, Singapore. S$7.94M[8]. October 2012-September 2017.

55. iTrust: Project CYPRO (Cyber Infrastructure Protection), Ministry of Defense, Singapore. S$4.5M. October 2013-September 2016.

56. Temasek Laboratories: Empirical Assessment of Techniques for Detecting and Responding to Sensor Attacks in Cyber Physical Systems. S$50,000 (Co-PI with Justin Ruths). April 2014-July 2015.

57. iTrust: Project ASPIRE (Advancing Security of Public Infrastructure using Resilience and Economics), National Research Foundation, Singapore. S$ 5.3M. January 2015-December 2019.

58. Design and Construction of Electrical Power and Intelligent Control (EPIC) testbed. International Design Center. S$ 1M. April 1, 2015-March 31, 2016.

59. PI: Design and Construction of Water Distribution (WADI) testbed. International Design Center. S$ 350,000. April 1, 2015-March 31, 2016.

60. PI: Advanced-Intelligent Anomaly Detection System, NCR2016NCR-NCR002-023, S$ 1,247,808.00, 1 September 2017–31 August 2019.

61. PI: Testing for Blockchain Security by Design, NCR2016NCR-NCR002-028, S$ 1,411,500.00, September 2017–31 August 2019.

UNIVERSITY SERVICE

Administrative positions

1. *Member*, Graduate and Undergraduate Computer Science Curriculum development committee, Birla Institute of Technology and Science, Pilani, India, 1973.

[8] 1S$≈ 0.800US$ as of June 26, 2014.

2. $Head$, Department of Computer Science, Birla Institute of Technology and Science, Pilani, India, 1982-1985.

3. $Member$ of several project review committees set up by the Department of Electronics, Government of India, my role was advisory, 1982-1985.

4. $Member$, Research Board (responsible for the administration of doctoral and other research programs), Birla Institute of Technology and Science, Pilani, India, 1980-1985.

5. $Member$, University Senate, Birla Institute of Technology and Science, Pilani, India, 1982-1985.

6. $Member$, Facilities Committee, Department of Computer Science, Purdue University, 1991.

7. $Alternate\ member$ School of Science Grievance Committee, Purdue University, 1991.

8. $Faculty\ mentor$ Summer Research Program for minorities, Purdue University, Summer 1991.

9. $Chairman$ Department Colloquia and Seminars, Purdue University, 1991-92.

10. $Member$ School of Science Elections Committee, Purdue University, 1992-93.

11. $Member$ Facilities Committee, Purdue University, 1992-93.

12. $Incharge$ SERC Seminar, Fall 1993.

13. $Member$ Teaching Evaluation Committee, Purdue University, Fall 1993.

14. *Member* PRF Summer Faculty Grants committee, Purdue University, Spring 1994.

15. *Member* Hiring committee, Purdue University, 1993-94.

16. *Member* Head Review Committee, Purdue University, 1993-94.

17. *Acting Director*, Software Engineering Research Center, Purdue University, Janaury 1, 1994 till June 30, 1994.

18. *Member*, Ad-hoc committee to examine duplication of courses in EE and CS departments, August 1995.

19. *Director*, Software Engineering Research Center, Purdue University, July 1995-2001.

20. *Member*, Faculty Search Committee, Department of Computer Science, 1996-98; *Chair*, Committee for the evaluation of yearly progress of Assistant Professors; *Member* Space Committee, 1998, *Member*, Visual Arts Committee, 1997-98.
21. *Faculty Advisor* Indian Classical Music Association (ICMAP), 1997-2002.
22. *Member*, Summer PRF Grants Evaluation Committee, 1997-1998.
23. *Member* Graduate Council, 1998-2000.
24. *Associate Head*, Department of Computer Science, 1997-2001
25. *Chair*, Graduate Committee, 1998-2001.
26. *Member* Personnel Committee, 1998-2002.
27. *Chair*, Graduate Admissions Committee, 1999-2001 and member 2001-2002.
28. *Chair*, PRF Evaluations Committee (CS), 2000.
29. *Chair*, Internet Olympiad Committee, 2000-2002.
30. *Member*, CS Awards Committee and Personnel committee, 2001-2002.
31. *Chair*, CS Head Search Committee, 2001-2002.
32. *Member*, GEA, Graduate School, 2004–2007.
33. *Member*, IUPUI College of Science Dean Search Committee, 2007.

PROFESSIONAL SERVICES

Consultancy

1. Full time consultant to DCM Data Products, a leading computer manufacturing company in India during June/July 1981.
2. Part time consultant for Sree Technical Services, Atlanta, a software company.
3. Consultant to Guidant Corporation, Minneapolis, July 2003.

Conferences, Workshops, and Special Courses

4. Chair, 3-week summer school on Microprocessors sponsored by Indian Society of Technical Education, 1979.
5. Chair, 2-week winter school on Microprocessors for University teachers sponsored by the Indian Society of Technical Education., 1980.

6. Chair, 1-week intensive lecture-cum-workshop on Compiler Construction conducted for the engineers of DCM Data Products, New Delhi, India, (the participants of this course used some of the rare and early compiler writing tools which I had developed namely the SLR(1) Parser Generating System and a lexical analyzer generator), 1980.

7. Co-chair, 14th Minnowbrook Workshop on Software Engineering, July 23-26, 1991 at Blue Mountain Lake, NY; sponsored by SERC, Syracuse University, and Rome Air Development Center.

8. Co-Chair, Workshop on Issues in Software Reliability Estimation, sponsored by SERC and Department of Computer Science, May 21, 1991 at Purdue University.

9. Panel member, Battle of the Testing Gurus, Software Quality Week'91, San Francisco, May 1991.

10. Panel member, Innovations in Software Testing and Quality Assurance, International Computer Software and Applications Conference, Tokyo, September 1991.

11. Session Chair, Scheduling and Operating Systems Issues and Parallel and Distributed Systems at International Computer Software and Applications Conference, Tokyo, September 1991.

12. Program Co-Chair, Second Workshop on Issues in Software Reliability Estimation, Piscataway, New Jersey, October 12-13, 1992. Other Co-Program chairs: Vernon Rego and Bob Horgan (Bellcore).

13. Member, Program Committee, Third International Symposium on Software Reliability Engineering, Research Triangle Park, NC, October 7-9, 1992.

14. Member, Program Committee, 15th International Conference on Software Engineering (ICSE 15) Baltimore, MD, May 18-20, 1993.

15. Session Chair, session 1E-Testing, 15th International Conference on Software Engineering, May 17-21, 1993.

16. Chair, panel on "Issues in Software Reliability Estimation: A Research Agenda" at the Fifth International Symposium on Software Reliability Engineering, Monterey, California, November 6-9, 1994.

17. Chair, International Program Committee, First International Conference on Software Testing, Reliability, and Quality Assurance (STRQA'94), New Delhi, India, Dec. 19-22, 1994; Co-Chair STRQA'96, Taiwan.

18. Member Organizing Committee, Fourth Bellcore/PTT/Purdue Workshop on Issues in Software Reliability, Netherlands, October 22-23, 1995.

19. Member, Program Committee, Tenth Brazilian Symposium on Software Engineering, Saõ Carlos, Brazil, October 1996.

20. Member, Program Committee, Seventh International Symposium on Software Reliability Engineering, New York, October 1996.

21. Member, Program Committee, Eleventh Brazilian Symposium on Software Engineering, Fortaleza, Brazil, October 1997.

22. Member Program Committee, session chair, and a panelist, Eight International Symposium on Software Reliability Engineering, Albaquerque, November 1997.

23. Co-Coordinator, Software Engineering Re-training (SERT) course for Raytheon, Indianapolis, June-July 1998.

24. Coordinator, Software Analysis and Design course for Raytheon, Indianapolis, June 1999.

25. Member Program Committee, Ninth International Symposium on Software Reliability Engineering, Paderborn, Germany, November 1998.

26. Member, Program committee Application-specific Software Engineering and Technology (ASSET'98)

27. Member Program Committee, Ninth International Symposium on Software Reliability Engineering, Boca Raton, Florida, November 1999.

28. General Chair, Mutation 2000, October 2000, San Jose, CA, USA.

29. Member, Program Committee, Workshop on Object-Oriented Reliable Distributed Systems (WOODS 2000), Nürnberg, Germany.

30. Member, Doctoral Symposium Committee, International Conference on Software Engineering 2001, Toronto.

31. Member Program Committee, 12th International Symposium on Software Reliability Engineering, Hongkong, October 2001.

32. Member Program Committee, 13th International Symposium on Software Reliability Engineering, November 12-15, 2002, Annapolis, MD.

33. Session Chair, 13th International Symposium on Software Reliability Engineering, November 12-15, 2002, Annapolis, MD.

34. Software Testing: Techniques, Tools, and Processes, a short course at Guidant Corporation, Minneapolis. August 12-16, 2002.

35. Software Testing, a short course at Guidant Corporation, Minneapolis. May 19-23, 2003.

36. Organizer, Software Technology and Engineering Practice (STEP 2003) workshop on "Software Test and Reliability Estimation Process," Amsterdam, September 19, 2003.

37. Chair, Brainstorming session on "Center for Research in Software Technologies (CRiST)," November 15, 2003, BITS, Pilani, India.

38. Chair, First Workshop on Software Cybernetics, International Computer Software and Applications Conference, Hong Kong, Sept 30, 2004.

39. Member Program Committee, 28th International Computer Software and Applications Conference, Sept 28-30, 2004, Hong Kong.

40. Panelist, Panel of Computer Supported Work in Software Engineering, 28th International Computer Software and Applications Conference, Hong Kong, Sept. 28-30, 2004.

41. Member Program Committee, 29th International Computer Software and Applications Conference, July 26-28, 2005, Edinburgh, Scotland.

42. Co-Chair, 2nd International Workshop on Software Cybernetics, Edinburgh, Scotland, July 26-28, 2005, Edinburgh, Scotland.

43. Moderator, Panel on "Model-based testing and verification," 29th International Computer Software and Applications Conference, Edinburgh, Scotland, July 26-28, 2005, Edinburgh, Scotland.

44. Member, Program Committee, International Symposium on Software Reliability Engineering, Chicago, November 8–11, 2005.

45. Member, Program Committee, Second Workshop Model Design and Validation in conjunction with MoDELS, Montego Bay, Jamaica, October 3, 2005.

46. Honorary Chair, The First IFIP Workshop on Trusted and Autonomic Ubiquitous and Embedded Systems (TAUES 2005), Nagasaki, Japan, 6-9 December 2005.

47. Co-Chair, Program Committee, 30th International Computer Software and Applications Conference, Chicago, September 18-21, 2006.

48. Member, Steering Committee, 3rd International Workshop on Software Cybernetics, Chicago, September 18-21, 2006.

49. Member, Program Committee, The 17th International Symposium on Software Reliability Engineering, 6-10 November 2006 - Raleigh, North Carolina, USA

50. Member, Program Committee, 13th Asia-Pacific Software Engineering Conference (APSEC'06), December 6-8, 2006, Bangalore, India.

51. Co-Chair, Program Committee, Seventh International Conference on Quality Software, Portland, Oregon, 2007.

52. Member, steering committee, 2nd and 3rd Workshops on Advances in Model-based Software Testing, 2006 and 2007.

53. Member, steering committee, COMPSAC 2007, Beijing.

54. Testing Techniques for Achieving Highly Reliable Software, short course for Graduate Students and Software Test Professionals, Universidade de São Paulo, São Carlos, Brazil February 6-7, 2007.

55. Member, Program Committee, Second Workshop on Automation of Software Test, Minneapolis, May 20-26, 2007.

56. Member, Program Committee, The 18th International Symposium on Software Reliability Engineering, 5-9th of November, 2007, Trollhättan, Sweden.

57. PC Co-Chair, First International Conference on Software Testing, Verification, and Validation, Lillehammer, Norway. April 9-11, 2008

58. Member, Program Committee, 1st India Software Engineering Conference, Hyderabad, India, February 19-22, 2008.

59. Member, Program Committee, COMPSAC, Turkey, 2012.

60. Member, Program Committee, COMPSAC, Atlanta, 2016

61. Co-Chair, Workshop on Cyber Physical Systems Security (CPSS 2019), Auckland, 2019

62. Member, Program Committee, ACM Workshop on Cyber-Physical Systems Security and Privacy (CPS-SPC), London, 2019