

VITA
NEELAM GUPTA

The University of Arizona
Department of Computer Science
Gould-Simpson Bldg., Rm. 708
1040 E. Fourth St.
Tucson, AZ 85721-0077

Email: ngupta@cs.arizona.edu
URL: <http://www.cs.arizona.edu/~ngupta>
Telephone: 520-626-8282
FAX: 520-621-4246

Chronology of Education

PhD. Computer Sciences, Purdue University, West Lafayette, Indiana, December 1999.

Thesis Title: *Automated Test Data Generation Using Iterative Relaxation Methods.*

Dissertation Advisors: Aditya P. Mathur and Mary Lou Soffa.

M.S. Computer Sciences, Purdue University, West Lafayette, Indiana, 1991.

M.S.(Tech.) Computer Science, Birla Institute of Technology and Science, Pilani, India, 1986.

B.E.(Honors) Electrical and Electronics Engineering, Birla Institute of Technology and Science, Pilani, India, 1986.

Chronology of Employment

Assistant Professor, Department of Computer Science,
University of Arizona, Tucson. (January 2000 - August 2007)

Assistant Professor, Department of Computer Engineering,
Delhi College of Engineering, Delhi, India. (April 1994 - December 1996)

Officiating Head of the Department, Department of Computer Engineering,
Delhi College of Engineering, Delhi, India. (October 1994 - January 1995)

Executive, Technical Training Division, Center for Development of Telematics (C-DOT),
New Delhi, India. (July 1993 - April 1994)

Research Assistant Department of Computer Sciences, Purdue University,
West Lafayette, Indiana, USA. (August 1990 - April 1992)

Teaching Assistant Department of Computer Sciences, Purdue University,
West Lafayette, Indiana, USA. (August 1988 - April 1990)

Computer Consultant, UNiSYS Corporation, Mission Viejo, California, USA.
(February 1987 - August 1988)

Programmer Analyst, Tata UNiSYS Ltd., New Delhi, India.
(July 1986 - February 1987)

Honors and Awards

Best Paper Award out of a total of 183 paper submissions: "Prioritizing Test Cases Using Relevant Slices," *30th Annual International Computer Software and Applications Conference (COMPSAC 2006)*, Chicago, USA, September 18-21, 2006.

Nominated for Best Paper Award - 5 papers nominated out of 164 paper submissions: "Program Execution Based Module Cohesion Measurement," *16th IEEE International Conference on Automated Software Engineering (ASE 2001)*, pages 144-153, San Diego, USA, November 2001.

Awarded “**Japanese Government (Monbusho) Scholarship for 1996,**” Ministry of Education, Science and Culture, Government of Japan, September 1995.

Awarded “**The National Talent Search Scholarship,**” National Council of Education, Research and Training, Government of India, September 1981.

Member *Upsilon Pi Epsilon*, Purdue Chapter, West Lafayette, IN, 1998.

Service/Outreach

National/International Outreach

Member

ACM’s Committee on *Women in Computing* (ACM-W), January 2006-present.

Chair

- **Workshops Co-Chair**, *22nd IEEE/ACM International Conference on Automated Software Engineering (ASE 2007)*, Atlanta, USA, November 5-9, 2007.
- **Program Committee Co-Chair**, *Third International Workshop on Software Quality Assurance (SOQUA 2006)*, co-located with FSE 2006, Portland, Oregon, November 2006.
- **Program Committee Co-Chair**, *Fourth International Workshop on Dynamic Analysis (WODA 2006)*, co-located with ICSE 2006, Shanghai, China, May 2006.

Program Committee Member

- *First IEEE International Conference on Software Testing, Verification, and Validation (ICST 2008)*, Lillehammer, Norway, April 9-11, 2008.
- *22nd IEEE/ACM International Conference on Automated Software Engineering (ASE 2007)*, Atlanta, USA, November 5-9, 2007.
- *31st Annual International Computer Software and Applications Conference (COMPSAC 2007)*, Beijing, China, July 24-27, 2007.
- *ACM SIGPLAN/SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES 2007)*, part of FCRC 2007, San Diego, California, June 2007.
- *Fifth International Workshop on Dynamic Analysis (WODA 2007)*, co-located with ICSE 2007, Minneapolis, Minnesota, USA, May 22, 2007.
- *The Fourth International Workshop on Software Cybernetic (IWSC’07)*, co-located with COMPSAC 2007, Beijing, China, July 24, 2007.
- *21st IEEE/ACM International Conference on Automated Software Engineering (ASE 2006)*, Tokyo, Japan, September 18-22, 2006.
- *30th Annual International Computer Software and Applications Conference (COMPSAC 2006)*, Chicago, USA, September 18-21, 2006.
- *International Workshop on Security, Privacy, and Trust for Pervasive Applications (SPTPA 2006)*, co-located with COMPSAC 2006, Chicago, USA, September 18-21, 2006.
- *ICSE Workshop on Dynamic Analysis (WODA 2005)*, co-located with International Conference on Software Engineering, St. Louis, Missouri, USA, 2005.
- *Second International Workshop on Software Quality (SOQUA 2005)*, Erfurt, Germany.
- *ICSE Workshop on Dynamic Analysis (WODA 2004)* co-located with International Conference on Software Engineering, Edinburgh, Scotland, UK, 2004.
- *18th IEEE International Conference on Automated Software Engineering (ASE 2003)*, Montreal, Canada, 2003.

Session Chair

- *30th Annual International Computer Software and Applications Conference (COMPSAC 2006)*, Chicago, USA, September 18-21, 2006.
- *ICSE Workshop on Dynamic Analysis (WODA 2006)*, co-located with ICSE 2006, Shanghai, China, May 2006.
- “Numerical Approaches I” session at the 18th International Symposium on Mathematical Programming (ISMP), Copenhagen, Denmark, 2003.

Journal Referee

- *IEEE Transactions on Software Engineering (TSE)*.
- *ACM Transactions on Software Engineering Methodology (TOSEM)*.
- *Journal of Automated Software Engineering (JASE)*.
- *Software - Practice and Experience (SPE)*.
- *IEEE Transactions on Systems, Man and Cybernetics (TSMC)*.
- *Journal for Applicable Algebra in Engineering, Communication and Computing (AAECC)*, Springer Verlag.
- *Journal of Scheduling*.

Conference and Workshop Referee

- IEEE International Conference on Software Engineering.
- IEEE Conference on Automated Software Engineering.
- ACM Symposium on Applied Computing.
- Workshop on Dynamic Analysis.

Proposal Referee

NSF CAREER Panel.

Departmental Committees

Awards Committee, (2006-2007).
Graduate Examinations, (2006-2007).
Colloquium Czar, (2005-2006).
Graduate Admissions Committee, (2004-2005).
Graduate Curriculum Committee, (2000-2001), (2001-2002), Spring 2003.
Under-Graduate Curriculum Committee, (2001-2002), (2003-2004).
Instructional and Administrative Computing, (2000-2001).

University Committees

Committee on Graduate Studies, (2000-2001), Spring 2003, (2003-2004), (2004-2005).
Committee for Research Assistant Awards, (2001-2002).

Other Committees

Chair, **PhD Thesis** Committee of Dennis Jeffrey, August 2005 - August 2007.
Chair, **M.S. Thesis** Committee of Dennis Jeffrey,
“Test Suite Reduction with Selective Redundancy,” *M.S. Thesis* by Dennis Jeffrey,
Advisor: Neelam Gupta, Department of Computer Sciences,
The University of Arizona, August 2005.

Chair, **M.S. Thesis** Committee of Haifeng He,
“Automated Debugging Using Path-Based Weakest Preconditions,” *M.S. Thesis*
by Haifeng He, *Advisor*: Neelam Gupta, Department of Computer Sciences,
The University of Arizona, May 2004.

Member, **Ph.D. Thesis** Committee of Sriraman Tallam, September 2005 - present.

Member, **Ph.D. Thesis** Committee of Xiangyu Zhang, September 2005 - September 2006.

Member, **Ph.D. Thesis** Committee of Bhithika Khargharia in ECE department, January 2006 - August 2007.

Member, **M.S. Thesis** Committee of Praveen Rao, August 2001.

Publications/Creative Activity (Published or Accepted)

Journal Papers and Chapters in Scholarly Books and Monographs

1. Dennis Jeffrey and Neelam Gupta, “Experiments with Test Case Prioritization Using Relevant Slices,” *Journal on Systems and Software (JSS)* to appear in a **Special Issue on Model-Based Software Testing**, 26 pages, *In Press*. Only 8 papers were accepted for publication in this Special Issue of the Journal of Systems and Software out of a total of 43 papers submitted for this special issue. **Acceptance Rate: 18.6% (8/43)**.
2. Dennis Jeffrey and Neelam Gupta, “Improving Fault Detection Capability by Selectively Retaining Test Cases During Test Suite Reduction,” *IEEE Transactions on Software Engineering (TSE)*, pages 108-123, vol. 33, no. 2, February 2007.
3. Xiangyu Zhang, Neelam Gupta, and Rajiv Gupta, “Locating Faulty Code by Multiple Points Slicing,” *Software - Practice & Experience (SPE) Journal*, vol. 37, no. 9, pages 935-961, July 2007.
4. Xiangyu Zhang, Neelam Gupta, and Rajiv Gupta, “A Study of Effectiveness of Dynamic Slicing in Locating Real Faults,” *Empirical Software Engineering Journal (ESE)*, Vol. 12, no. 2, pages 143-160, April 2007.
5. Xiangyu Zhang, Neelam Gupta, and Rajiv Gupta, “Whole Execution Profiles and their Use in Debugging,” Chapter 18, *The Compiler Design Handbook: Optimizations and Machine Code Generation*, Second Edition, CRC Press, Accepted to appear (Invited Chapter).
6. Neelam Gupta and Rajiv Gupta, “Data Flow Testing,” Chapter 7, *The Compiler Design Handbook: Optimizations and Machine Code Generation*, First Edition, pages 247–267, CRC Press, September 2002 (Invited Chapter).

Refereed Conference Papers

7. Vijay Nagarajan, Dennis Jeffrey, Rajiv Gupta, and Neelam Gupta, “ONTRAC: A System for Efficient ONLINE TRACing for Debugging,” *21st IEEE International Conference on Software Maintenance (ICSM 2007)*, Paris, October 2007. Acceptance Rate: 21% (46/214)
8. Xiangyu Zhang, Sriraman Tallam, Neelam Gupta, and Rajiv Gupta, “Towards Locating Execution Omission Errors,” *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2007)*, San Diego, June 2007. Acceptance Rate: 25% (45/178)
9. Neelam Gupta and Rajiv Gupta, “ExPert: Dynamic Analysis based Fault Location via Execution Perturbations,” *NSF Next Generation Software Workshop (NSFNWS)*, held in conjunction with IPDPS, March 2007.
10. Dennis Jeffrey and Neelam Gupta, “Prioritizing Test Cases Using Relevant Slices,” *30th Annual International Computer Software and Applications Conference (COMPSAC 2006)*, Chicago, USA, September 18-21, 2006. **Acceptance Rate: 31% (57/183)**. This paper won the **Best Paper**

Award out of a total of 183 papers submitted to the conference and was recommended by the program committee for publication in a special issue of the *Journal on Systems and Software*.

11. Xiangyu Zhang, Neelam Gupta, and Rajiv Gupta, "Pruning Dynamic Slices With Confidence," *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2006)*, pages 169–180, Ottawa, Canada, June 2006. **Acceptance Rate: 21.3% (36/169)**.
12. Xiangyu Zhang, Neelam Gupta, and Rajiv Gupta, "Locating Faults Through Automated Predicate Switching," *IEEE/ACM International Conference on Software Engineering (ICSE 2006)*, pages 272–281, Shanghai, China, May 2006. **Acceptance Rate: 9% (36/395)**.
13. Neelam Gupta, Haifeng He, Xiangyu Zhang, and Rajiv Gupta, "Locating Faulty Code Using Failure-Inducing Chops," *20th IEEE/ACM International Conference on Automated Software Engineering (ASE 2005)*, pages 263–272, Long Beach, California, November 7-11, 2005. **Acceptance Rate: 9.9% (28/291)**.
14. Dennis Jeffrey and Neelam Gupta, "Test Suite Reduction with Selective Redundancy," *21st IEEE International Conference on Software Maintenance (ICSM 2005)*, pages 549–558, Budapest, Hungary, September 25-30, 2005. **Acceptance Rate: 30.5% (55/180)**.
15. Xiangyu Zhang, Haifeng He, Neelam Gupta, and Rajiv Gupta, "Experimental Evaluation of Using Dynamic Slices for Fault Location," *Sixth International Symposium on Automated and Analysis-Driven Debugging (AADEBUG 2005)*, pages 33–42, Monterey, California, September 19-21, 2005. **Acceptance Rate: 36.7% (11/30)**.
16. Sriraman Tallam and Neelam Gupta, "A Concept Analysis Inspired Greedy Algorithm for Test Suite Minimization," *ACM SIGPLAN-SIGSOFT Workshop on Program Analysis for Software Tools and Engineering (PASTE 2005)*, co-located with Joint European Software Engineering Conference and ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/FSE 2005), pages 35–42, Lisbon, Portugal, September 5-6, 2005.
17. Haifeng He and Neelam Gupta, "Automated Debugging using Path-Based Weakest Preconditions," *Fundamental Approaches to Software Engineering (FASE'04)*, ETAPS Joint Conference 2004, pages 267–280, Barcelona, Spain, March 29-31, 2004. **Acceptance Rate: 24.1% (22/91)**.
18. Neelam Gupta, YongJun Cho and Mohammad Z. Hossain, "Experiments with UNA for Solving Linear Constraints in Real Variables," *ACM Symposium on Applied Computing (SAC 2004)*, pages 1013–1020, March 14-17, 2004, Nicosia, Cyprus. **Acceptance Rate: 35.5% (280/787)**.
19. Neelam Gupta and Zachary V. Heidepriem, "A New Structural Coverage Criteria for Dynamic Detection of Program Invariants," *18th IEEE International Conference on Automated Software Engineering (ASE'03)*, pages 49–58, Montreal, Quebec, Canada, October 6-10, 2003. **Acceptance Rate: 12.9% (22/170)**.
20. Neelam Gupta, "Generating Test Data for Dynamically Discovering Likely Program Invariants," *ICSE 2003 Workshop on Dynamic Analysis* co-located with *International Conference on Software Engineering (ICSE 2003)*, Portland, Oregon, USA, May 3-10, 2003.
21. Srinivas Visvanathan and Neelam Gupta, "Generating Test Data for Functions with Pointer Inputs," *17th IEEE International Conference on Automated Software Engineering (ASE'02)*, pages 149–160, Edinburgh, UK, September 2002. **Acceptance Rate: 20.2% (19/94)**.
22. Neelam Gupta and Praveen Rao, "Program Execution Based Module Cohesion Measurement," *16th IEEE International Conference on Automated Software Engineering (ASE'01)*, pages 144–153, San Diego, CA, November 2001. **Acceptance Rate: 19.5% (32/164)**. This paper was **Nominated for Best Paper Award** (only 5 papers out of a total of 164 submitted papers were nominated for this award).

23. Neelam Gupta, “A Hierarchy of Structural Coverage Criteria for Testing Multithreaded Programs,” *International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA '01)*, Vol. IV, pages 1641–1646, Las Vegas, Nevada, June 2001.
24. Neelam Gupta, Aditya P. Mathur, and Mary Lou Soffa, “Generating Test Data for Branch Coverage,” *15th IEEE International Conference on Automated Software Engineering (ASE'00)*, pages 219–227, Grenoble, France, September 2000. **Acceptance Rate: 23% (23/100).**
25. Neelam Gupta, Aditya P. Mathur, and Mary Lou Soffa, “UNA Based Iterative Test Data Generation and its Evaluation,” *14th IEEE International Conference on Automated Software Engineering (ASE'99)*, pages 224–232, Cocoa Beach, Florida, October 1999. **Acceptance Rate: 20.3% (25/123).**
26. Neelam Gupta, Aditya P. Mathur, and Mary Lou Soffa, “Automated Test Data Generation Using an Iterative Relaxation Method,” *ACM SIGSOFT Sixth International Symposium on Foundations of Software Engineering (FSE-6)*, pages 231–244, Orlando, Florida, November 1998. **Acceptance Rate: 19.8% (22/111).**

Scholarly Presentations

Invited Talks

- “Automated Test Data Generation,” Programmer Productivity Research Center, Microsoft Research, Redmond, WA, August 2002.
- “Automated Test Data Generation Using An Iterative Relaxation Method,” Dept. of Computer Sciences, University of Arizona, Tucson, AZ, April 1999.
- “Automated Test Data Generation Using An Iterative Relaxation Method,” Dept. of Management and Information Sciences, University of Pittsburgh, Pittsburgh, PA, March 1999.
- “Automated Test Data Generation Using An Iterative Relaxation Method,” Dept. of Information and Software Engineering, George Mason University, Fairfax, VA, March 1999.
- “Automated Test Data Generation Using An Iterative Relaxation Method,” Dept. of Computer Engineering and Computer Sciences, California State University, Long Beach, CA, March 1999.
- “Automated Test Data Generation Using An Iterative Relaxation Method,” Bellcore, Morristown, NJ, USA, July 1998.

Refereed Conference Presentations

- Annual International Computer Software and Applications Conference (COMPSAC), (1 paper presentation).
- ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), (1 paper presentation).
- IEEE International Conference on Automated Software Engineering (ASE), (6 paper presentations)
- ACM SIGOFT International Symposium on Foundations of Software Engineering (FSE), (1 paper presentation).
- Fundamental Approaches to Software Engineering (FASE), ETAPS Joint Conference, (1 paper presentation).
- ACM SIGPLAN-SIGSOFT Workshop on Program Analysis for Software Tools and Engineering (PASTE), (1 paper presentation).
- ACM Symposium On Applied Computing (SAC) (1 paper presentation).
- International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA), (1 paper presentation).

Grants and Contracts

- Co-PI: **National Science Foundation**, “CRI: IAD An Advanced Infrastructure for Generation, Storage, and Analysis of Program Execution Traces,” CRI Program, CNS-0708199, \$50,000, September 2007-August 2008. (PI: R. Gupta). (**Acceptance Rate: 15-20%**).
- PI, **National Science Foundation**, “ExPert: dynamic analysis based fault location via Execution Perturbations,” CISE, CSR Program, CNS-0614707, \$332,000, September 2006-August 2009 (Co-PI: R. Gupta). (**Acceptance Rate: 10–15%**).
- PI, **Microsoft Research**, “Integrating Dynamic Slicing into the coredbg Debugger,” Phoenix/SSCLI, Redmond, Washington, \$48,000, April 2006-March 2007, (Co-PI: R. Gupta). (**Acceptance Rate: 13%**).
- Co-PI, **IBM**, Eclipse Innovation Award, *An Eclipse Module for Matching Execution Histories of Program Versions*, \$27,000, January 2005-December 2005 (PI: R. Gupta).
- Co-PI, **ACIST**, The University of Arizona, *Collection, Storage and Analysis of Whole Execution Traces* \$19,844, January 2005-December 2005 (PI: R. Gupta).
- Co-PI, **REU, NSF, CISE-RI**, *Optimization of Distributed and Networked Systems: A Spectrum of Techniques*, EIA-0080123, total \$15,000 for the duration 2001-2004.
- Contributing Investigator, **NSF CISE-RI**, *Optimization of Distributed and Networked Systems: A Spectrum of Techniques*, EIA-0080123, \$1,396,252, 2000-2005.
- PI (100%), **ACIST**, The University of Arizona, *Integrating lcc Frontend, Extending Features of the TGEN Prototype and Preparing it for Release*, \$29,156, June 2004-May 2005.
- Co-PI (100%), **ACIST**, The University of Arizona, *Automated Debugging*, in the multi-department collaborative project on *Autonomic Computing*, \$20,000, January 2003-December 2003.
- PI (100%), **ACIST**, The University of Arizona, *Scalable Techniques for Path Based Coverage Testing of Programs*, \$12,000, May 2003-December 2003 .
- PI (100%), **Microsoft Gift**, support for *Runtime Monitoring and Checking for Program Correctness*, \$10,000, January 2002-December 2002.

Teaching

- Spring 2007:** CSc 436 - Software Engineering.
- Fall 2006:** CSc 620 - Advanced Execution Systems for Reliable Computing.
- Spring 2006:** CSc 436/536 - Software Engineering.
- Fall 2005:** CSc 576 - Computer Architecture.
- Spring 2005:** CSc 630 - Software Analysis, Testing and Verification.
- Spring 2005:** CSc 436/536 - Software Engineering.
- Spring 2004:** CSc 436/536 - Software Engineering.
- Fall 2003:** CSc 630 - Software Analysis, Testing and Verification.
- Spring 2003:** CSc 435 - Software Engineering.
- Spring 2002:** CSc 435 - Software Engineering.
- Fall 2001:** CSc 435 - Software Engineering.

Spring 2001: CSc 344 - Foundations of Computing.

Fall 2000: CSc 630 - Software Validation and Verification.

Spring 2000: CSc 344 - Foundations of Computing.