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Indranil Gupta

CURRENT POSITION

Associate Professor, Dept. of Computer Science, University of Illinois at Urbana-Champaign, IL 61801.
(Also Affiliate Faculty in the Dept. Of Electrical and Computer Engineering)

EDUCATION

Ph.D.	Computer Science Cornell University, Ithaca, NY, USA.	Jan. 2004
Master of Science	Computer Science Cornell University, Ithaca, NY, USA.	2001
Bachelor of Technology	Computer Science and Engineering Indian Institute of Technology (IIT), Chennai, India.	1998

RESEARCH INTERESTS

Distributed Protocols; Large-Scale Distributed Systems; Cloud Computing; Sensor Networks.

RESEARCH AND WORK EXPERIENCE

- [2009-Present] University of Illinois at Urbana Champaign: Associate Professor, Dept. of Computer Science. Leader of the Distributed Protocols Research Group (DPRG): <http://dprg.cs.uiuc.edu>
- [2003-2009] University of Illinois at Urbana Champaign: Assistant Professor, Dept. of Computer Science.
- [1998-2003] Cornell University: Graduate Teaching Assistant and Graduate Research Assistant with Dr. Kenneth P. Birman, Spinglass Project.
- [June-August 2001] Microsoft Research Labs, Cambridge, UK: Intern, Distributed Systems Group.
- [June-August 2000] IBM Research, T.J. Watson Center: Intern, Océano Server Farm Project.
- [1997-1998] Indian Institute of Technology (IIT), Chennai (India): Undergraduate Research.

AWARDS

- [2010] Faculty Fellowship, Academy for Entrepreneurial Leadership, UIUC (2010). Awarded to only 5 faculty campus-wide.
- [2009-2010] Center for Advanced Studies/Beckman Fellowship, UIUC.
- [2008] Junior Xerox Award for Faculty Research, UIUC (2008). Awarded to only 4 assistant professors across all Departments of Engineering at UIUC.

- [2008] co-PI on the Cloud Computing Testbed at University of Illinois. Funding from Yahoo!, HP, Intel and NSF.
- [2005] National Science Foundation Faculty Early CAREER Development Award.
- [2003-Present] Listed in the UIUC “List of Teachers Ranked as Excellent” seven times - during Fall 2003, Fall 2004, Fall 2005, Spring 2006, Spring 2007, Fall 2007, and Spring 2008. Fall 2005, Spring 2006, Fall 2007, and Spring 2008 ratings were in the *-ed (Outstanding) category. Based on ICES student feedback forms.

STUDENT AWARD WINNERS

- [2007-2008, 2008-2009] Brian Cho: Cohen Fellowship for Early CS Ph.D. Students. (Ph.D. Thesis Advisor: Indranil Gupta).
- [2009] Imranul Hoque: State Farm Grand Prize in Siebel Center’s Computing Habitat Competition.
- [2007] Brian Cho: C. W. Gear Award for Outstanding CS Undergraduate, UIUC. (Brian was then a senior undergraduate doing research under Indranil Gupta’s guidance, and is now a Ph.D. student with Gupta).
- [2006] Thadpong Pongthawornkamol: David J. Kuck Best MS Thesis Award, Department of Computer Science, UIUC. (MS Thesis Advisor: Indranil Gupta)

RESEARCH FUNDING AND SUPPORT

- [Jul 2010 - Jun 2014] (PI, \$600,000) National Science Foundation: CCF 0964471, Tackling and Understanding Intermediate Data in Cloud Applications as a First-Class Citizen.
- [May 2010 - May 2012] (co-PI, \$75,000) Beckman New Research Directions Funding.
- [Mar 2010 - Feb 2012] (co-PI, \$293,892) National Science Foundation: CNS 0958314, II-New: Towards Green Data Centers: A Testbed for Thermo-Computational Dynamics.
- [Aug 2008 - Jul 2010] (co-PI, \$200,000) National Science Foundation: IIS 0841765, SGER: Acquisition and Operation of an Experimental Testbed for System-Level Research to Support Data-Intensive Computing Applications. (Cloud Computing Testbed)
- [Aug 2009 - Aug 2010] (co-PI/Senior Personnel, \$100,000) National Science Foundation CRI 0855129, Exploring Social Trust in Mobile Educational Environments
- [Mar 2005 - Feb 2010] (PI, \$450,000) National Science Foundation CAREER Grant: CNS 0448246, CAREER: Systematic Design of Distributed Protocols - from Methodologies and Toolkits to Systems.
- [Nov 2009 - Nov 2010] (PI) Amazon Web Services Research Grant.
- [Sep 2004 - Aug 2009] (co-PI, \$2.37 Million) National Science Foundation ITR Grant: CMS 0427089 ITR, ITR: IT-Based Collaboration Framework for Preparing Against, Responding to, and Recovering from Disasters Involving Critical Physical Infrastructures.
- [2005-2006] (PI) UIUC-INRIA-CNRS Collaboration Grant, Department of Computer Science, University of Illinois at Urbana-Champaign.
- [Summer 2006] (PI, \$6K) National Science Foundation grant on Research Experience for Undergraduates (REU).
- [2003-2005] (PI) NCSA Developmental Grant: CCR040005. NCSA IA64 cluster access.

GRADUATED Ph.D. STUDENTS (listed in chronological order)

1. Steven Y. Ko, Defended Successfully on July 17, 2009, Received Degree: 2009. “Efficient On-Demand Operations in Dynamic Distributed Systems.” *Next Employment: Assistant Professor, Department of Computer Science and Engineering, SUNY-Buffalo. (Deferred starting date Fall 2010, in order to be a Post-doctoral Scholar in the Computer Science Department at Princeton University, 2009-2010).*
2. Ramses V. Morales, Defended Successfully on June 25, 2009, Received Degree: 2009. “Design of

Availability-Dependent Distributed Services in Large-Scale Uncooperative Settings." *Next Employment: Postdoctoral Scholar, Xerox Labs, Webster, NY.*

3. Jay A. Patel, Defended Successfully on April 1, 2009, Received Degree: 2009. "Addressing Heterogeneity to Improve Scale and Performance of Distributed Systems." *Next Employment: Yahoo!, Champaign.*

SERVICE

- PC Co-Chair for ACM/IFIP/Usenix Middleware 2010.
- PC Co-Chair for IEEE SASO 2010.
- General Chair for ACM PODC 2007.
- Associate Vice-Chair for ICDCS 2008 Track (Wireless and Mobile Computing Track).
- Workshops Co-chair for IEEE SASO 2009.
- Track Chair, Cloud Computing Track, SSS 2009.
- Treasurer for ACM PODC 2006, and for ACM NOSSDAV 2007.
- Steering Committee Member for ACM PODC 2006, and for ACM PODC 2007.
- Awards Chair for ACM PODC 2008.
- Publicity Co-chair for SASO 2008.
- General and Program Chair, StoDiS workshop, December 2005; <http://www.stodis.org>.
- Co-Chair for Special Session in Conference on Evolutionary Computation (CEC), 2007.
- PC Member for:
 - 2011: ICDCS 2011 (OS and Middleware Track), ICAC 2011, DCDV 2011
 - 2010: ICDCS 2010 (OS and Middleware Track), ICDCN 2010, DCOSS 2010, IEEE SECON 2010, EDCC 2010, MTAGS 2010
 - 2009: ACM/IFIP/Usenix Middleware 2009 (Main Track, and Industrial Track), ICDCS 2009 (Distributed Algorithms Track), COMSWARE 2009, ICDCN 2009, SASO 2009, IEEE SECON 2009, MTAGS 2009, Middleware Doctoral Symposium 2009
 - 2008: ACM/IFIP/Usenix Middleware 2008, IEEE SASO 2008, ICDCS 2008 (Sensor Networks Track), IPTPS 2008, Usenix HotDep 2008, MiNEMA 2008, IWSOS 2008, Middleware Doctoral Symposium 2008, MTAGS
 - 2007: ACM/IFIP/Usenix Middleware 2007, IEEE SASO 2007, SAHNS 2007, IWSOS 2007, ACM NOSSDAV 2007, I2CS 2007
 - 2006: ICDCN 2006, IEEE MASS 2006, Usenix HotDep 2006, ACM/IFIP/IEEE Middleware 2006, IWSOS 2006
 - 2005: StoDiS 2005
- Mock Thesis Committee Member, Middleware Doctoral Symposium, 2007.
- DOE Panelist: SBIR Panel, February 2011.
- NSF Panelist: March 2005, April 2007, June 2008, October 2009.
- Reviewer for IEEE TPDS, IEEE TNSM, ACM TAAS, IEEE TDSC, Distributed Computing, ACM TOCS, ACM/IEEE TON, JPDC, IEEE TMM, IEEE Network, IEEE Comm. Letters, IEEE TMC, IEEE TSE, JSS, ComNets, AdHocNets, DISC, DSN, IPDPS.

COURSES TAUGHT

- CS 425 - Distributed Systems: Fall 2010, Fall 2007, Fall 2006, Spring 2005, Spring 2004 (CS 328).
- CS 525 - Advanced Distributed Systems: Spring 2011, Spring 2010, Spring 2009, Spring 2008, Spring

2007, Spring 2006 (CS 598IG), Fall 2004 (CS 598IG), Fall 2003 (CS 497IG).

- CS 423 - Operating Systems: Fall 2005 (Undergraduate).
- CS241 - System Programming: Fall 2008.
- CS 591FSN - Mathematical Tools and Foundations in Systems and Networking Research: Spring 2010.
- CS 591SN - New Systems and Networking Seminar: Fall 2005 - Present.
- CS 591IG - Advanced Seminar in Distributed Systems: Spring 2005 - Present.

PUBLICATION COPIES ONLINE

All publications available on DPRG website: <http://dprg.cs.uiuc.edu>

JOURNAL PUBLICATIONS (all lists in reverse chronological order)

1. A. I. Avetisyan, R. Campbell, I. Gupta, M. Heath, S. Ko, G. R. Ganger, M. Kozuch, D. O'Hallaron, M. Kunze, T. Kwan, K. Lai, M. Lyons, D. Milojicic, H. Y. Lee, N. K. Ming, J.-Y. Luke, H. Namgong, Y. C. Soh. "Open Cirrus: A Global Cloud Computing Testbed," *IEEE Computer*, pp. 35-43, April 2010.
2. L. Vu, I. Gupta, K. Nahrstedt. "Understanding Overlay Characteristics of a Large-scale Peer-to-Peer IPTV System," *ACM Transactions on Multimedia Computing, Communications and Applications (TOMCCAP)*, 2010.
3. J. A. Patel, H. Luo, I. Gupta, "Routing in the Frequency Domain," *Wireless Networks*, vol. 16, no. 2, February 2010. DOI: 10.1007/s11276-008-0151-0.
4. V. Raman, I. Gupta. "Performance Tradeoffs Among Percolation-Based Broadcast Protocols in Wireless Sensor Networks," *International Journal of Parallel, Emergent and Distributed Systems (IJPEDS)*, February, 2010.
5. J. A. Patel, E. Riviere, I. Gupta, A.-M. Kermarrec. "Rappel: Exploiting Interest and Network Locality to Improve Fairness in Publish-Subscribe Systems", *Computer Networks*, April 2009. DOI: 10.1016/j.comnet.2009.03.018.
6. R. V. Morales, I. Gupta. "AVCOL: Availability-Aware Information Aggregation in Large Distributed Systems under Uncollaborative Behavior", *Computer Networks*, March 2009. DOI: 10.1016/j.comnet.2009.03.006.
7. R. V. Morales, I. Gupta, "AVMON: Optimal and Scalable Discovery of Consistent Availability Monitoring Overlays for Distributed Systems," *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, vol. 20 no. 4, pp. 446-459, April, 2009.
8. S. Ko, I. Gupta, Y. Jo. "A New Class of Nature-Inspired Algorithms for Self-Adaptive Peer-to-Peer Computing," *ACM Transactions on Autonomous and Adaptive Systems (TAAS)*, vol. 3, no. 3, August, 2008.
9. C. Sengul, M. J. Miller, I. Gupta, "Adaptive Probability-Based Broadcast Forwarding in Energy-Saving Sensor Networks," *ACM Transactions on Sensor Networks (TOSN)*, vol. 4, no. 2, pp. 6:1-32, March 2008.
10. J. Liang, I. Gupta, K. Nahrstedt, "Reliable On-Demand Management Operations for Large-scale Distributed Applications," *ACM SIGOPS Operating Systems Review (OSR), Special Issue on Gossip-Based Networking*, vol. 41, no. 5, pp. 82-88, October 2007.
11. R. V. Morales, S. Monnet, G. Antoniu, I. Gupta, "MOVE: Design and Evaluation of A Malleable Overlay for Group-Based Applications," *IEEE Transactions on Networks and Service Management (TNSM), Special Issue on Self-Management*, vol. 4, issue 2, pp. 107-116, September 2007.
12. T. Pongthawornkamol, I. Gupta, "AVCast: New Approaches for Implementing Availability-Dependent Reliability for Multicast Receivers," *IEEE Transactions on Networks and Service Management (TNSM), Special Issue on Self-Management*, vol. 4, issue 2, pp. 117-126, September

2007.

13. S. Ko, P. Yalagandula, I. Gupta, V. Talwar, D. Milojicic, S. Iyer, "Querying Large Distributed Infrastructures," *IEEE TCSC Newsletter*, vol. 9, no.1, 2007.
14. I. Gupta, M. Nagda, C. F. Devaraj, "The Design of Novel Distributed Protocols from Differential Equations," *Distributed Computing (Elsevier)*, vol. 20, no. 2, pp. 95-114, August 2007. (Note: Topmost Journal in Distributed Algorithms)
15. D. Kostoulas, D. Psaltoulis, I. Gupta, K. Birman, A. J. Al Demers, "Active and Passive Techniques for Group Size Estimation in Large-Scale and Dynamic Distributed Systems," *Elsevier Journal of Systems and Software*, vol. 80, no. 10, pp. 1639-1658, October 2007.
16. A. Harris, R. Kravets, I. Gupta, "Building Trees Based On Aggregation Efficiency in Sensor Networks," *Elsevier Journal on Ad-Hoc Networks (ADHOC)*, vol. 5, no. 8, pp. 1317-1328, November 2007.
17. J. A. Patel, I. Gupta, "Bridging the Gap: Augmenting Centralized Systems with P2P Technologies," *ACM SIGOPS Operating Systems Review (OSR), Special Issue on Self-Organizing Systems*, vol. 40, no. 3, pp. 14-17, July 2006.
18. I. Gupta, A.-M. Kermarrec, A. J. Ganesh, "Efficient and Adaptive Epidemic-style Multicast Protocols," *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, vol. 17, no. 7, pp. 593-605, July 2006.
19. G. He, R. Zheng, I. Gupta, "A Framework for Time Indexing in Sensor Networks," *ACM Transactions on Sensor Networks (TOSN)*, vol. 1, no. 1, pp. 101-133, August 2005.
20. I. Gupta, K. P. Birman, R. van Renesse, "Fighting Fire with Fire: using Randomized gossip to Combat Stochastic Scalability Limits," *Journal of Quality and Reliability Engineering International*, vol. 18, no. 3, pp. 165-184, May/June 2002.
21. I. Gupta, G. Manimaran, C. Siva Ram Murthy, "A New Strategy for Improving the Effectiveness of Resource Reclaiming Algorithms in Multiprocessor Real-time Systems," *Journal of Parallel and Distributed Computing*, vol. 60, no. 2, pp. 113-133, January 2000.

BOOKS EDITED AND BOOK CHAPTERS

1. I. Gupta, C. Mascolo (PC Co-Chairs) "Proceedings of ACM/IFIP/USENIX 11th International Middleware Conference, Bangalore, India, November 29 - December 3, 2010," LNCS Vol. 5462, Springer-Verlag, 2010.
2. I. Gupta, S. Hassas, J. Rolia, M. Jelasity, J. Sztipanovits (PC Co-Chair), "Proceedings of the 2010 Fourth IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO)," Budapest, Hungary, September 27 - October 1, 2010, 2010.
3. I. Gupta, Roger Wattenhofer (Chairs and Editors) "Proceedings of the 26th ACM Symposium on Principles of Distributed Computing (PODC 2007)," ACM Press, August 12-15, 2007.
4. I. Gupta, "Coordination and Synchronization: Designing Practical Detectors for Distributed Systems," *Wiley Encyclopedia of Computer Science and Engineering* (Editor: Benjamin Wah), ECSE 85, Wiley Engineering, January 2008.
5. I. Gupta, "Systematic Design of P2P Technologies for Distributed Systems," *Global Data Management* (eds: R. Baldoni, G. Cortese, F. Davide and A. Melpignano), IOS Press, ISBN: 1586036297, pp. 160-176, 2006.
6. I. Gupta, S. Ko, Nathanael Thompson, Mehwish Nagda, Christo F. Devaraj, R. V. Morales, J. A. Patel, "A Case for Methodology Research in Self-* Distributed Systems," *Self-Star Properties in Complex Information Systems* (eds: O. Babaoglu et al), Springer, Lecture Notes in Computer Science (LNCS) 3460, pp. 260-272, 2005.
7. I. Gupta, G. Manimaran, and C. Siva Ram Murthy, "Primary-backup based fault-tolerant dynamic scheduling of object-based tasks in multiprocessor real-time systems," Chapter 20 in *Dependable Network Computing*, D.R. Avresky (editor), Kluwer Academic Publishers, MA, USA, 1999.

CONFERENCE PUBLICATIONS (Acceptance Rates 20% and below are Italicized)

1. S. Ko, I. Hoque, B. Cho, I. Gupta. "Making Cloud Intermediate Data Fault-Tolerant," Proceedings of ACM Symposium on Cloud Computing (SOCC), pp. 181-192, 2010. (*Acceptance Rate: 23/119 = 19.32%*)
2. L. Vu, K. Nahrstedt, S. Retika, I. Gupta. "Joint Bluetooth/Wifi Scanning Framework for Characterizing and Leveraging People Movement on University Campus," Proc. 13th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWIM), 2010.
3. B. Cho, I. Gupta. "Planning Algorithms for Bulk Transfer via Internet and Shipping Networks," Proceedings of 30th International Conference on Distributed Computing Systems (ICDCS), 2010. (*Acceptance Rate: 84/585 = 14.35%*)
4. A. Verma, N. Zea, B. Cho, I. Gupta, R. Campbell. "Breaking the MapReduce Stage Barrier," Proceedings of IEEE International Conference on Cluster Computing, 2010. (Acceptance Rate: 33/107 = 30.84%)
5. L. Vu, K. Nahrstedt, S. Retika, I. Gupta. "Joint Bluetooth/Wifi Scanning Framework for Characterizing and Leveraging People Movement on University Campus," Proceedings of 13th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWIM), 2010. (Acceptance Rate: 43/132 = 32.57%)
6. H. Ahmadi, T. F. Abdelzaher, I. Gupta. "Congestion Control for Spatio-temporal Data in Cyber-physical Systems," First International Conference on Cyber-Physical Systems (ICCPs), 2010.
7. A. Arefin, Y. Sarwar, I. Gupta, K. Nahrstedt. "Q-Tree: A Multi-Attribute Based Range Query Solution for Tele-Immersive Framework," Proceedings of International Conference on Distributed Computing Systems (ICDCS), 2009. (*Acceptance Rate: 74/455 = 16.26%*)
8. R. Malik, C. Ramachandran, I. Gupta, K. Nahrstedt. "A Scalable and Memory-Efficient Feature Extraction Algorithm for Short 3D Video Segments," Proceedings of IMMERSCOM, 2009. (Acceptance Rate: 23/53 = 43%)
9. M. Montanari, R. Crepaldi, I. Gupta, R. Kravets. "Using Failure Models for Controlling Data Availability in Wireless Sensor Networks," Proceedings of IEEE Infocom Minisymposium, 2009. (Acceptance Rate: 382/1435 = 26.6%)
10. R. Malik, S. Kim, X. Jin, C. Ramachandran, J. Han, I. Gupta, K. Nahrstedt. "MLR-Index: An Index Structure for Fast and Scalable Similarity Search in High Dimensions," Proceedings of 2009 Int. Conf. on Scientific and Statistical Database Management (SSDBM'09), 2009.
11. S. Ko, P. Yalagandula, I. Gupta, V. Talwar, D. Milojevic, S. Iyer, "Moara: Flexible and Scalable Group-Based Querying System," Proceedings of ACM/IFIP/USENIX Middleware, 2008. (*Acceptance Rate: 21/117 = 17.94%*)
12. S. Ko, I. Hoque, I. Gupta, "Using Tractable and Realistic Churn Models to Analyze Quiescence Behavior of Distributed Protocols," Proceedings of IEEE Symposium on Reliable Distributed Systems (SRDS), 2008. (Acceptance Rate: 28/112 = 25%)
13. V. A. Korthikanti, P. Mittal, I. Gupta, "Fair K Mutual Exclusion Algorithm for Peer to Peer Systems," Proceedings of International Conference on Distributed Computing Systems (ICDCS), 2008. (*Acceptance Rate: 102/638 = 15.9%*)
14. W. Wu, Z. Yang, I. Gupta, K. Nahrstedt, "Towards Multi-Site Collaboration in 3D Tele-Immersive Environments," Proceedings of International Conference on Distributed Computing Systems (ICDCS), 2008. (*Acceptance Rate: 102/638 = 15.9%*)
15. I. Hou, Y. Tsai, T. Abdelzaher, I. Gupta, "AdapCode: Adaptive Network Coding for Code Updates in Wireless Sensor Networks," Proceedings of IEEE INFOCOM, pp. 2189-2197, 2008. (*Acceptance Rate: 236/1152 = 20.48%*)
16. S. Ko, R. V. Morales, I. Gupta, "New Worker-Centric Scheduling Strategies for Data-Intensive Grid

- Applications," Proceedings of ACM/IFIP/USENIX Middleware, Springer Lecture Notes in Computer Science (LNCS) 4834, pp. 121-142, November 2007. (*Acceptance Rate* = 22/107 = 20%)
17. R. V. Morales, B. Cho, I. Gupta, "AVMEM - Availability-Aware Overlays for Management Operations," Proceedings of ACM/IFIP/USENIX Middleware, Springer Lecture Notes in Computer Science (LNCS) 4834, pp. 266-286, November 2007. (*Acceptance Rate*: 22/107 = 20%)
 18. R. V. Morales, I. Gupta, "AVMON: Optimal and Scalable Discovery of Consistent Availability Monitoring Overlays for Distributed Systems," Proceedings of International Conference on Distributed Computing Systems (ICDCS), pp. 55-64, 2007. (*Acceptance Rate*: 71/528 = 13.4%)
 19. L. Vu, I. Gupta, J. Liang, K. Nahrstedt, "Measurement and Modeling of a Large-scale Overlay for Multimedia Streaming," Invited Paper Proceedings of International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (QShine), 2007.
 20. S. Ko, I. Gupta, Y. Jo, "Novel Mathematics-Inspired Algorithms for Self-Adaptive Peer-to-Peer Computing," Proceedings of IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO), pp. 3-12, 2007. (*Acceptance Rate*: 25/120 = 20.8%)
 21. J. A. Patel, H. Luo, I. Gupta, "A Cross-Layer Architecture to Exploit Multi-Channel Diversity with a Single Transceiver," Proceedings of IEEE INFOCOM Minisymposium, pp. 2261-2265, 2007. (*Acceptance Rate*: 25%)
 22. S. Monnet, R. V. Morales, G. Antoniu, I. Gupta, "MOve: Design of an Application-Malleable Overlay," Proceedings of IEEE Symposium on Reliable Distributed Systems (SRDS), pp. 355-364, 2006. (*Acceptance Rate*: 29%)
 23. T. Pongthawornkamol, I. Gupta, "AVCast : New Approaches For Implementing Availability-Dependent Reliability for Multicast Receivers," Proceedings of IEEE Symposium on Reliable Distributed Systems (SRDS), pp. 345-354, 2006. (*Acceptance Rate*: 29%)
 24. R. R. Choudhury, P. Kyasanur, I. Gupta, "Smart Gossip: An Adaptive Gossip-based Broadcasting Service for Sensor Networks," Proceedings of IEEE Symposium on Mobile Ad-Hoc and Sensor Systems (MASS), pp. 91-100, 2006. (*Acceptance Rate*: 24.48%)
 25. V. Bhandari, I. Gupta, "PriorityCast: Efficient and Time-Critical Decision Making in First Responder Ad-Hoc Networks," Proceedings of IEEE Symposium on Mobile Ad-Hoc and Sensor Systems (MASS), pp. 246-255, 2006. (*Acceptance Rate*: 24.48%)
 26. W. J. Jeon, I. Gupta, K. Nahrstedt, "QoS-aware Object Replication in Overlay Networks," Proceedings of IEEE Global Telecommunications Conference (Globecom), 2006. (*Acceptance Rate*: 40.2%)
 27. J. A. Patel, I. Gupta, N. Contractor, "JetStream: Achieving Predictable Gossip Dissemination by Leveraging Social Network Principles," Proceedings of IEEE International Symposium on Network Computing and Applications (NCA), pp. 32-39, 2006. (*Acceptance Rate*: 35%)
 28. M. Treaster, W. Conner, I. Gupta, K. Nahrstedt, "ContagAlert: Using Contagion Theory for Adaptive, Distributed Alert Propagation," Proceedings of IEEE International Symposium on Network Computing and Applications (NCA), pp. 126-136, 2006. (*Acceptance Rate*: 35%)
 29. W. Conner, K. Nahrstedt, I. Gupta, "Preventing DoS attacks in peer-to-peer media streaming systems," Proceedings of Annual Multimedia Computing and Networking (MMCN), 2006. (*Acceptance Rate*: 19.5%)
 30. S. Ko, I. Gupta, "Perturbation-Resistant and Overlay-Independent Resource Discovery," Proceedings of IEEE International Conference Dependable Systems and Networks (DSN), Yokohama, pp. 248-257, Japan, 2005. (*Acceptance Rate* 20%)
 31. M. J. Miller, C. Sengul, I. Gupta, "Exploring the Energy-Latency Trade-off for Broadcasts in Energy-Saving Sensor Networks," Proceedings of IEEE International Conference on Distributed Computing Systems (ICDCS), pp. 17-26, 2005. (*Acceptance Rate*: 14%, *Track Acceptance Rate*: 10%)
 32. D. Kostoulas, D. Psaltoulis, I. Gupta, K. Birman, A. J. Demers, "Decentralized Schemes for Size

- estimation in Large and Dynamic Groups," Proceedings of IEEE International Symposium Network Computing and Applications (NCA), Cambridge (MA), pp. 41-48, 2005. (Acceptance Rate: 23.9%)
33. C. F. Devaraj, M. Nagda, I. Gupta, "An Underlay for Sensor Networks: Localized Protocols for Maintenance and Usage," Proceedings of IEEE Conference Mobile Ad-Hoc and Sensor Systems (MASS), pp. 8-15, 2005. (Acceptance Rate: 35%)
 34. J. Newell, I. Gupta, "The P2P MultiRouter: a Black Box Approach to Run-time Adaptivity for P2P DHTs," Proceedings of IEEE Conference on Collaborative Computing (CollaborateCom), 2005. (Acceptance Rate: 43%)
 35. R. Zheng, G. He, I. Gupta, L. Sha, "Time Indexing in Sensor Networks," Proceedings of IEEE Mobile and Sensor Systems (MASS), pp. 274-283, October 2004. (Acceptance Rate: $52/200 = 25.5\%$)
 36. I. Gupta, "On the Design of Distributed Protocols from Differential Equations," Proceedings of ACM Symposium on Principles on Distributed Computing (PODC), pp. 216-225, 2004. (Acceptance Rate = 17.4%)
 37. A. S. Das, I. Gupta, A. Motivala, "SWIM: Scalable Weakly-consistent Infection-style process group Membership protocol," Proceedings of IEEE International Conference on Dependable Systems and Networks (DSN), pp. 303-312, June, 2002. (Acceptance Rate: 31%)
 38. I. Gupta, A.-M. Kermarrec, A. J. Ganesh, "Efficient Epidemic-style Protocols for Reliable and Scalable Multicast," Proceedings of IEEE Symposium Reliable Distributed Systems (SRDS), pp. 180-189, October, 2002. (Acceptance Rate: 30%)
 39. I. Gupta, K. Birman, P. Linga, A. J. Demers, R. van Renesse, "Kelips: building an Efficient and Stable P2P DHT through increased Memory and Background overhead," Proceedings of International Workshop on Peer-to-Peer Systems (IPTPS), Springer, Lecture Notes in Computer Science (LNCS) 2735, pp. 160-169, February, 2003. (Acceptance Rate: 16.36%)
 40. I. Gupta, R. van Renesse, K. P. Birman, "Scalable Fault-tolerant Aggregation in Large Process Groups," Proceedings of IEEE International Conference on Dependable Systems and Networks (FTCS/DSN), pp. 433-442, July, 2001. (Acceptance Rate: 35.09%)
 41. I. Gupta, T. D. Chandra, G. S. Goldszmidt, "On Scalable and Efficient Distributed Failure Detectors," Proceedings of ACM Symposium on Principles of Distributed Computing (PODC), pp. 170-179, August, 2001. (Acceptance Rate: 28.7%)
 42. S. A. Fakhouri, G. S. Goldszmidt, I. Gupta, Michael Kalantar, John A. Pershing, "Gulf-stream - a system for Dynamic Topology Management in Multi-domain Server Darms," Proceedings of IEEE International Conference on Cluster Computing (Cluster), October 2001. (Acceptance Rate: 47.2%)
 43. I. Gupta, R. van Renesse, K. P. Birman, "A Probabilistically correct Leader Election Protocol for Large Groups." Proceedings of International Symposium on Distributed Computing (DISC), Springer, Lecture Notes in Computer Science (LNCS) 1914, pp. 89-103, October, 2000. (Acceptance Rate: 23%)

INDUSTRIAL CONFERENCE PUBLICATIONS

- S. Ko, P. Yalagandula, I. Gupta, V. Talwar, D. Milojevic, S. Iyer, J. Purushottaman, "Data center Level Metrics Via In-network Aggregation," Proceedings of HP Annual Technical Conference (TechCon), 2007. (Acceptance Rate: $40/1000 = 4\%$)

WORKSHOP PUBLICATIONS

1. R. Campbell, I. Gupta, M. Heath, et. al., "Open Cirrus: Cloud Computing Testbed: Federated Data Centers for Open Source Systems and Services Research," Proceedings of First Usenix Workshop on Hot Topics in Cloud Computing (HotCloud I), 2009.

2. S. Ko, I. Hoque, B. Cho, I. Gupta. "On Availability of Intermediate Data in Cloud Computations," Proceedings of 12th Usenix Workshop on Hot Topics in Operating Systems (HotOS XII), 2009.
3. V. Raman, I. Gupta. "Performance Tradeoffs Among Percolation-based Broadcast Protocols in Wireless Sensor Networks", Proceedings of WWASN, 2009.
4. S. Ko, I. Gupta, "Efficient On-Demand Operations in Dynamic Distributed Infrastructures," Proceedings of Workshop on Large-Scale Distributed Systems and Middleware (LADIS), 2008.
5. E. Ucan, N. Thompson, I. Gupta, "A Piggybacking Approach to Reduce Overhead in Sensor Network Gossiping," Proceedings of International Workshop on Middleware for Sensor Networks (MidSens), 2007.
6. M. J. Miller, I. Gupta, "Practical Exploitation of the Energy-Latency Tradeoff for Sensor Network Broadcast," Proceedings of IEEE Workshop on Sensor Networks and Systems for Pervasive Computing (PerSeNS), pp. 318-322, 2007. (Acceptance Rate: 28.9%)
7. A. Harris, R. Kravets, I. Gupta, "Building Trees Based On Aggregation Efficiency in Sensor Networks," Proceedings of IFIP/IEEE Annual Mediterranean Ad Hoc Networking Workshop (Med Hoc Net), June, 2006.
8. J. Liang, S. Ko, I. Gupta, K. Nahrstedt, "MON: On-demand Overlays for Distributed System Management," Proceedings of Usenix Workshop on Real Large Distributed Systems (WORLDS), 2005 (Acceptance Rate: 40%).
9. R. V. Morales, I. Gupta, "Providing Both Scale and Security through a Single Core Probabilistic Protocol," Proceedings of Workshop on Stochasticity in Distributed Systems (StoDiS), 2005. (Acceptance Rate: 34%)
10. A. S. Cheema, M. Moosa, I. Gupta, "Peer-to-peer Discovery of Computational Resources for Grid Applications," Proceedings of IEEE/ACM Workshop on Grid Computing (GRID), pp. 179-185, 2005. (Acceptance Rate: 18.8%)
11. C. Abad, I. Gupta, "Adding Confidentiality to Application-Level Multicast by Leveraging the Multicast Overlay," Proceedings of Fourth IEEE International Workshop on Assurance Distributed Systems and Networks (ADSN), pp. 5-11, 2005.
12. J. A. Patel, and I. Gupta, "Overhaul: an HTTP extension to combat Flash Crowds," In Proceedings of Ninth Workshop on Web Caching (WCW), Springer, Lecture Notes in Computer Science (LNCS) 3293, pp. 34-43, October 2004. (Acceptance Rate: $21/50 = 42\%$)
13. P. Linga, I. Gupta, Ken Birman, "A Churn-resistant Peer-to-peer Web-Caching System," Proceedings of ACM Workshop on Survivable and Self-Regenerative Systems (SSRS 03), pp. 1-10, October 2003. (Acceptance Rate: 38.4%)
14. I. Gupta, "Minimal CDMA Recoding Strategies for Power-controlled Ad-hoc Wireless Networks," Proceedings of IEEE International Workshop on Parallel and Distributed Computing issues in Wireless Networks and Mobile Computing, pp. 187, April 2001.
15. I. Gupta, Ken Birman, "Holistic Operations in Large-scale Sensor Network Systems: a Probabilistic Peer-to-peer Approach," Proceedings of International Workshop on Future Directions in Distributed Computing (FuDiCo), Bertinoro, Springer, Lecture Notes in Computer Science (LNCS) 2584, pp. 180-185, June 2002. (Acceptance Rate: 64%)

INVITED LECTURES

Outside UIUC (excluding conference paper presentations)

1. Google (Mountain View). "Using Ephemeral and Eternal Overlays for Monitoring Distributed Systems," Jan 28, 2011.
2. Keynote Speaker, Fourth International Workshop on Middleware for Sensor Networks (MidSens), "Natural Wireless Sensor Networks," December 1, 2009.

3. Panelist, Sixth Middleware Doctoral Symposium (MDS), "What's in the Cloud?" November 30, 2009.
4. Microsoft Research (Redmond). "Wizards and Fruitflies - Using Ephemeral and Eternal Overlays for Monitoring Distributed Systems," July 31, 2008.
5. University of Washington, Department of Computer Science. "Wizards and Fruitflies - Using Ephemeral and Eternal Overlays for Monitoring Distributed Systems," June 2, 2008.
6. University of Chicago, Computation Institute. "Lightweight Monitoring Techniques for Large-Scale Distributed Systems," May 22, 2008.
7. Princeton University, Department of Computer Science. "Wizards and Fruitflies - Using Ephemeral and Eternal Overlays for Monitoring Distributed Systems," May 6, 2008.
8. Georgia Institute of Technology, College of Computing (CERCS). "Wizards and Fruitflies - Using Ephemeral and Eternal Overlays for Monitoring Distributed Systems," February 6, 2008.
9. University of Michigan at Ann-Arbor, Department of Computer Science and Engineering. "Wizards and Fruitflies - Using Ephemeral and Eternal Overlays for Monitoring Distributed Systems," January 28, 2008.
10. University of Texas at Austin, Department of Computer Science. "Wizards and Fruitflies - Using Ephemeral and Eternal Overlays for Monitoring Distributed Systems," November 9, 2007.
11. Purdue University, Department of Computer Science. "Wizards and Fruitflies - Using Ephemeral and Eternal Overlays for Monitoring Distributed Systems," October 22, 2007.
12. University of Toronto, Department of Computer Science. "Local Actions for Global Predicates in Distributed Systems," November 17, 2006.
13. Microsoft Research, Silicon Valley Center. "Systematic Design of Distributed Protocols - From methodologies to Systems," December 11, 2005.
14. Invited Panelist at Web Caching Workshop (WCW) 2003. Organized at IBM T. J. Watson Research Center. Panel Topic: "Caching the Uncachable - An Uphill Battle Against Dynamic and Personalized Content."

Within UIUC

1. Department of Computer Science, Panel on "Industry Internships" Spring 2010.
2. Department of Computer Science, CS598LRS Course for Ph.D. students "Improving Your Research Skills" (organized by Lui Sha). Gave Special Lecture on "How do I start building a research career?" Spring 2007.
3. Department of Computer Science Colloquium, UIUC, "Is there a Tipping Point for Distributed Systems?" Academic year 2006/07.
4. Symposium on Understanding Complex Systems, UIUC, "Fighting Fire with Fire: using Probabilistic techniques to build Stress-resistant Networked Computer systems," May 17-20, 2004.
5. Department of Computer Science Colloquium, UIUC, "Fighting Fire with Fire: using Probabilistic techniques to build Stress-resistant Networked Computer systems," Academic year 2003/04.

DEPARTMENTAL SERVICE

- [2009-2011] Chair, Student Awards Committee, Department of Computer Science, UIUC.
- [2009-2011] Computer Science Advisory Committee, UIUC.
- [2009-2011] College of Engineering Awards Committee, UIUC.
- [2004-Present] Student Awards Committee, Department of Computer Science, UIUC.
- [2006-Present] Grad Study Committee, Department of Computer Science, UIUC.
- [2004-Present] Department of Computer Science: Undergraduate Student Advisor.
- [2004-Present] Department of Computer Science: Graduate Student Advisor.

- [2003-Present] Department of Computer Science: Qualifying Exam Committees in “Systems and Networking” area.
- [Spring 2008] Two-Member Committee for 2007-08 Annual Evaluation of Systems and Networking Graduate Students.
- [2006] Systems and Networking Distinguished Graduate Students Committee.
- [Fall 2007] Co-Organizer (with Klara Nahrstedt), TGIF lunch.
- [2003-Present] Prelim and Defense Committees for the following Ph.D. students: Harigovind Ramaswamy (Ph.D. 2005), Matthew J. Miller (Ph.D. 2006), Vanish Talwar (Ph.D. 2006), Cigdem Sengul (Ph.D. 2007), Jin Liang (Ph.D. 2007), Stephen Kloder (Ph.D. 2008), William Conner (Defended Ph.D. 2009), Chen-Chun Cheng (Defended Ph.D. 2008/09), Long Vu (Prelim: 2009), Kiran Lakkaraju (Defense Committee only; Expected Ph.D. 2009), Nathanael Thompson (Defended 2010), Myungjoo Ham (Defended Ph.D. 2009), Ramses V. Morales (Defended Ph.D. 2009), Steven. Y. Ko (Ph.D. 2009), Jay A. Patel (Ph.D. 2009), Wanmin Wu (Prelim: 2010), Thadpong Pongthawornkamol (Prelim: 2010), Yong Yang (Prelim: 2010), Jin Heo (Prelim: 2010).

SUPERVISION OF MASTER OF SCIENCE STUDENTS

1. Ercan Ucan, 2007, “Scheduling of multi-stream gossip systems.” First Employment: NVIDIA.
2. Charles Yang, 2006, “Deployable Techniques to Enable Cooperative Distribution of Web Content.” First Employment: Yahoo!
3. Thadpong Pongthawornkamol, 2006, “AVCast : New Approaches For Implementing Availability-Dependent Reliability for Multicast Receivers.” First Position Afterwards: A Ph.D. student in UIUC CS department. Kuck Best MS Thesis Award Winner 2006.
4. Ramses V. Morales, 2005, “Untraceability and Malleability in P2P Overlays.” First Position Afterwards: A Ph.D. student with Indranil Gupta.
5. (5 year BS/MS Thesis) Muhammad Moosa, 2005, “Efficient Mutual Exclusion in Peer-to-peer Systems.” First Employment: Motorola.
6. Dimitrios Psaltoulis, 2005, “Active Algorithms for Group Size Estimation in Peer-to-peer Systems and Wireless Sensor Networks.” First Employment: McKinsey and Co.
7. Yookyung Jo, 2005, “Designing Practical Distributed Systems from Sequence Equation Models.” First Position Afterwards: Ph.D. student at Cornell (Computer Science Department).
8. (5 year BS/MS Thesis) Adeep Singh Cheema, 2005, “Structured Naming and Peer-to-Peer Discovery of Resources in Grid Applications.” First Employment: Microsoft.
9. Kanwar Singh, 2004, “A Study of Membership Maintenance Protocols for Groups in Sensor Networks.”
10. (co-supervised with Feniosky Pena-Mora of CEE Department at UIUC) Dionysios Kostoulas, 2005, “Distributed Reputation-Based Mechanisms for Trust Propagation in Large Groups.” First Employment: Intrasoft International.
11. (co-supervised with Gul Agha) Mahvesh Nagda, 2004, “DiffGen: A Toolkit for generating Distributed Protocols from Differential Equations.” First Employment: Sandia National Labs.

SOFTWARE

Links to all available at one of the following two URLs: <http://dprg.cs.uiuc.edu/downloads/> or <http://dprg.cs.uiuc.edu/research?action=section§ion=Projects>

- (Available for direct download or use) ISS (Intermediate Storage System) for Hadoop, MON Monitoring Service for PlanetLab, PPLive Measurement Traces, PPLive crawler code, peerCounter Monitoring Software.

- (Available via email only, to track users) DiffGen, Folklore Distributed File System, Overhaul Apache Web Server and Client, AVMON Monitoring Software, Moara Monitoring Software, and others.
- Educational (Available for direct download): DSI (Distributed Systems Infrastructure), CS425 Machine Programming Assignments for 3-Stage Building of a P2P System.

NEWS ARTICLES ABOUT MY RESEARCH

- [2008] (article on Cloud Computing Testbed)
 - National Science Foundation (NSF): "NSF Announces Partnership with Industry, Academia to Further Explore Data-Intensive Computing."
URL: http://www.nsf.gov/news/news_summ.jsp?cntn_id=111984&org=NSF&from=news
 - Washington Post: "HP, Yahoo, Intel Launch Cloud Computing Test Bed."
URL: <http://www.washingtonpost.com/wp-dyn/content/article/2008/07/29/AR2008072901263.html>
 - Reuters: "HP, Intel and Yahoo study ways to make Web a utility."
URL: <http://uk.reuters.com/article/idUKN2932942320080729>
 - BBC: "HP, Intel, Yahoo in cloud tie-up."
URL: <http://news.bbc.co.uk/2/hi/technology/7531352.stm>
 - New York Times: "Yahoo, Intel and HP Form Cloud Computing Labs."
URL: http://www.nytimes.com/idg/IDG_852573C4006938800025749500529A63.html?ref=technology
- [2007] New York Resident: "In disaster aid, scientists look to bugs to help rescuers keep in touch" (Brandom Keim). URL: http://www.resident.com/issue_2007_07_16/resident/pages/65.html
- [2006] Above article also appeared in the Columbia News Service by the Columbia School of Journalism. URL: <http://jscms.jrn.columbia.edu/cns/2005-03-15/keim-lifesavingbugs/>
- [2005] UI News Bureau: "Insects, viruses could hold key for better human teamwork in disasters" (Andrea Lynn). URL: <http://www.news.uiuc.edu/news/05/0301disasterresearch.html>. This article also appears in several other outlets, e.g., Medical News Today. URL: <http://www.medicalnewstoday.com/articles/20541.php>
- Articles by UIUC CS Department:
 - [Feb 22, 2010] "Entrepreneurial-focused course seeks to expand on UI-Led Revolutions in Distributed Computing." URL: <http://cs.illinois.edu/news/2010/Feb22-3>
 - [Jul 29, 2008] "Cloud Computing Initiative to Study Internet-Scale Systems." URL: <http://cs.illinois.edu/node/282>
 - [Apr 10, 2008] "Professor Indranil Gupta Receives Xerox Award for Research."
 - [Apr 17, 2006] "Computers can mimic nature and outperform themselves."
 - [Feb 1, 2006] "DCS faculty show high success level in earning prestigious CAREER award."
 - [Mar 9, 2005] "Myriad Honors, Awards, and Accolades for CS Faculty."

PREVIOUS AWARDS

- [1998] Ranked 3rd in the class of 1998, IIT-Chennai, India; out of about 350 students.
- [1998] Secured 9th rank in the IIT-JEE 1994 (Indian Institutes of Technology Joint Entrance Examination); out of a total of about 100,000 candidates nationwide.
- [1998] Recipient of Gold Medal in National Standard Examination in Physics, India; out of a total of about 20,000 candidates appeared.
- [1998] Recipient of the National Talent Search Examination Scholarship awarded by the National

Council for Educational Research and Training, Government of India.

- [1998] Placed among the top 10 ranks in several national science talent search examinations in India, each among 20,000 - 100,000 students.