Prof. Kartik Gopalan

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Education

- Ph.D, Computer Science, State University of New York at Stony Brook, NY, USA, 2003.
- M.S, Computer Science, Indian Institute of Technology, Chennai, India, 1996.
- B.E, Computer Engineering, Delhi Institute of Technology, Delhi, India, 1994.

Research Interests: Virtualization, Cloud Computing, Distributed Systems, Security and Privacy.

Appointments

Sep. 2016 – Present	Professor, Computer Science, Binghamton University
Sep. 2009 – Aug. 2016	Associate Professor, Computer Science, Binghamton University
Sep. 2006 – Aug. 2009	Assistant Professor, Computer Science, Binghamton University
Aug. 2003 – Aug. 2006	Assistant Professor, Computer Science, Florida State University
Sept. 1999 – Feb. 2001	Lead Architect and Developer, Rether Network Inc.
Jun. 1999 – Aug. 1999	Intern, Reuters Information Technology
Jul. 1996 – Jun. 1997	Senior Software Engineer, Wipro Global Research and Development

Highlights:

- National Science Foundation CAREER Award 2009
- Watson School Recognition Award for Outstanding Research Achievement, Binghamton University, 2017
- Editorial Excellence and Eminence Award, IEEE Transactions on Cloud Computing, 2019
- External research funding of $5.7 million.
- 68 refereed publications.
- 12 US Patents granted.
- Associate Editor of IEEE Transactions on Cloud Computing, 2016-present
- IEEE Senior Member since 2016.

Summary of Scholarship and External Funding

Citations	4180
h-index	26
i10-index	51

Table 1: Citations Summary from Google Scholar as of Jan 1, 2019.

	All
As lead/sole PI	$2,266,196
As co-PI	$3,074,072
Licensing	$400,000
Total	$5,740,268

Table 2: External Funding and Licensing Summary

External Funding and Licensing

External Research Funding

1. ***NSF – Division of Computer and Network Systems***, "CSR: Small: Multi-hypervisor Virtual Machines – Enabling an Ecosystem of Hypervisor-level Services in the Cloud", Sole PI – Kartik Gopalan, $415,989, August 2015 – July 2019.(includes $16K REU Supplement).
2. ***Industrial Technologies Research Institute (ITRI), Taiwan***, "Lightweight Hypervisor-level Mechanisms For Guest Security and Reliability", Sole PI – Kartik Gopalan, $200,000, April 2017– July 2019. (2018-19 award pending).
3. ***NSF – Division of Computer and Network Systems***, "CSR: Small: Towards High-Performance, Robust, and Secure Live Migration of Virtual Machines", PI – Kartik Gopalan, co-PI Ping Yang $484,259, August 2013 – July 2017. (includes $16K REU Supplement).
4. ***AFRL – Griffis Institute***, "System Virtualization and its Applications to Security and Privacy of Cloud-based Systems", PI – Kartik Gopalan, co-PI Ping Yang, $5,634, August 2015 — March 2016.
5. ***Department of Education***, "Graduate Research Fellowships in Energy-aware Computing and Experimental Computer Systems", PI – Kanad Ghose, co-PIs Ping Yang, Kartik Gopalan, Mike Lewis, Leslie Lander, $399,798, Aug 16 2012 – Aug 15 2015.
6. ***NSF – Division of Computer and Network Systems***, "MRI: Development of a Fully Instrumented Self-Sensing and Self-Regulating Data Center", PI – Kanad Ghose, co-PI Bahgat Sammakia, Bruce Murray, Kartik Gopalan, $1,342,299, Oct 1 2010 – Sep 30 2013.
7. ***NSF – Division of Computer and Communication Foundations***, "REU SITE: Computer Systems Research in High Performance Cloud Computing Environments", PI – Mike Lewis, co-PI Kartik Gopalan, $331,934, June 1 2010 – May 31 2014.
8. ***NSF – Division of Computer and Network Systems***, "A Virtualized Cluster Testbed to Support Research In Large Memory And Data Intensive Applications ", PI – Kartik Gopalan, co-PI Ping Yang, Lei Yu, Lijun Yin, $325,178, October 1 2009 – Sep 30 2013. (Includes $16K REU Supplement)
9. ***NSF – Division of Computer and Network Systems***, "CAREER: Resource Coordination Techniques for Performance-aware Cluster Resource Virtualization", Sole PI – Kartik Gopalan, $415,900, June 1 2009 – May 31 2014. (Includes $16K REU Supplement)
10. ***NSF – Division of Computer and Network Systems***, "Collaborative Research – A Miniaturized Robotic Testbed for Development, Testing, and Evaluation of Protocols for Multi-Hop Wireless Networks", PI – Kartik Gopalan, co-PI Nael Abu-Ghazaleh, $330,736, July 1 2008 – June 30 2012. Lead institution: Binghamton University. Collaborating institution: Stony Brook University. Total Award amount: $480,736. (Includes two $16K REU Supplements).
11. ***DoD/Air Force Research Labs – STTR Phase 1***, "Securing Applications by Limiting Exposure", PI – Kartik Gopalan, co-PI Ping Yang, $50,000 (subcontract from industry partner Altusys Corp.; Total award amount $100,000), April 22 2011 – Jan 1 2012.
12. ***NSF – Division of Computer and Network Systems***, "Next Generation Real-Time Device Driver Architecture", $600,000, PI: Ted Baker, co-PIs: Kartik Gopalan and An-I Wang, July 1 2005 – June 30 2009.
13. ***NSF – Division of Computing and Communication Foundations***, "DCS: Delayed Finalization of MPI Collective Communication Routines", $300,041, PI: Xin Yuan, co-PIs: Kartik Gopalan and Zhenhai Duan, Feb 1 2006 – Jan 31 2009.
14. ***NSF – Division of Computer and Network Systems***, "Acquisition of an Infiniband Cluster with SMP Nodes", $100,000, PI: Xin Yuan, co-PIs: Kartik Gopalan and Robert van Engelen, March 1 2006 – Feb 28 2008.
15. ***Tele Atlas Inc.***, Research Contract, "Distributed Anemone: Transparent Low Latency Access to Remote Memory", $39,000 ($34,000 research support + $5,000 Options fee), PI: Kartik Gopalan, Sep. 2006–Sep. 2007.

Other Industry Grants, Licensing, and Intramural Awards

1. ***Patent Licensing***, Licensed a suite of patents on cluster-wide memory virtualization, $400,000, Dec 2011.
2. ***Google***, "Google Cloud Platform Education Grants", Kartik Gopalan, $16,500 Google Cloud Platform Credits for Graduate Operating Systems, 1/18/2017 — 1/18/2019.
3. ***Ammasso Inc.***, "Donation of 10 RDMA-Enabled Gigabit Ethernet Cards for Cluster Resource Virtualization Project", worth $4,500, Dec. 2005.
4. ***Harris Summer Scholar Program***, "Techniques to Enhance Vulnerability Analysis Capabilities of STAT Scanner ", Harris Corporation, $10,000, July 1 2004 – July 31 2004.
5. ***Planning Grant***, FSU Council for Research and Creativity, "VMNet: A Network of Virtual Machines", $9,980, PI: Kartik Gopalan, co-PI Zhenhai Duan, Dec 1 2005 – Nov 30 2006.
6. ***Planning Grant***, FSU Council for Research and Creativity, "Harnessing Distributed Cluster Resources for Memory-Intensive High-Performance Applications", $10,000, PI: Kartik Gopalan, Dec 1 2004 – Nov 30 2005.
7. ***First Year Assistant Professor Award***, FSU Council for Research and Creativity, "Network Resource Virtualization", $13,000 summer support, May 1 2004 – July 31 2004.

Refereed Publications

Journals

1. U. Deshpande, D. Chan, S. Chan, K. Gopalan, N. Bila, "Scatter-Gather Live Migration of Virtual Machines", IEEE Transactions on Cloud Computing, 6(1), 2018.
2. M. Gofman, R. Luo, C. Wyszynski, Y. Hu, P. Yang, and K. Gopalan, "Privacy-preserving Virtual Machine Checkpointing Mechanism", Journal of Cloud Computing, 3(3), 2014.
3. V. Rajanna, A. Jahagirdar, S. Shah, and K. Gopalan, "Explicit coordination to prevent congestion in data center networks", In the Journal of Cluster Computing, Special Issue on High Performance Distributed Computing, Volume 15, Issue 2, Page 183-200, 2012. **(Among selected papers at HPDC 2010 invited for journal publication).**
4. Z. Duan, K. Gopalan, and X. Yuan, "An Empirical Study of Behavioral Characteristics of Spammers: Findings and Implications", Computer Communications, Volume 34, Issue 14, September 2011. Pages 1764 - 1176.
5. J. Wang, K. Wright, and K. Gopalan, XenLoop : A Transparent High Performance Inter-VM Network Loopback", In the Journal of Cluster Computing – Special Issue on HPDC, Volume 12, Number 2, pages 141–152, 2009. **(Among selected papers at HPDC 2008 invited for journal publication).**
6. M. Hines, U. Deshpande, and K. Gopalan, "Post-Copy Live Migration of Virtual Machines", In SIGOPS Operating Systems Review, Volume 43, Number 3, pages 14–26, 2009 **(Among four papers at VEE 2009 selected for publication in OSR).**
7. K. Gopalan, T. Chiueh, and Y. Lin, "Slack Allocation Techniques for Intra-Path Load Balancing", In The Journal of High Speed Networks, Volume 16, Number 3, pages 211–237, 2007.
8. Z. Duan, Y. Dong, and K. Gopalan, "DMTP: Controlling Spam Through Message Delivery Differentiation", In Computer Networks Journal, Volume 51, Issue 10, pages 2616–2630, July 2007.
9. K. Gopalan, L. Huang, G. Peng, T. Chiueh and Y.-J. Lin, "Statistical Admission Control Using Delay Distribution Measurements", *In ACM Transactions on Multimedia Computing, Communications and Applications*, Volume 2, Number 4, pages 258–281, Nov. 2006.
10. A. Raniwala, K. Gopalan, and T. Chiueh, "Centralized channel assignment and routing algorithms for multi-channel wireless mesh networks", *ACM SIGMOBILE Mobile Computing and Communications Review*, Volume 8 , Issue 2, pages 50–65, April 2004.
11. K. Gopalan, T. Chiueh, and Y.J. Lin, "Load Balancing Routing with Bandwidth-Delay Guarantees", *IEEE Communications*, Volume 42, Number 6, pages 108–113, June 2004.
12. K. Gopalan, C. Murthy, and K.N. Murthy, "An Improved Mapping of Cyclic Elimination onto Hypercubes using Data Replication", Intl. Journal of High Speed Computing, Vol. 9, No. 4, 1997, pages

311–336.

13. K. Gopalan and C. Murthy, "New Parallel Algorithms for Direct Solution of Sparse Linear Systems : Part I - Symmetric Coefficient Matrix", Intl. Journal of High Speed Computing, Vol. 9, No. 4, 1997, pages 259–290.
14. K. Gopalan and C. Siva Ram Murthy, "New Parallel Algorithms for Direct Solution of Sparse Linear Systems : Part II - Non-Symmetric Coefficient Matrix", Intl. Journal of High Speed Computing, Vol. 9, No. 4, 1997, pages 291–310.

Conferences

15. D. Fernando, J. Terner, K. Gopalan, P. Yang, "Live Migration Ate My VM: Recovering a Virtual Machine From Failure of Post-Copy Live Migration", IEEE International Conference on Computer Communications (INFOCOM), Paris, France, 2019 (Accepted. Acceptance rate: 19.7%).
16. K. Gopalan, Y. Hu, R.K. Raghavendra, H. Bagdi, D. Williams, N. Bila, "Multi-Hypervisor Virtual Machines: Enabling an Ecosystem of Hypervisor-level Services", USENIX Annual Technical Conference (USENIX ATC), Santa Clara, CA, 2017 (Acceptance rate: 21.1%).
17. O. Kilic, S. Doddamani, A. Bhat, H. Bagdi, K. Gopalan, "Overcoming Virtualization Overheads in Large VCPU Virtual Machines", In MASCOTS 2018, Miwaukee, WI.
18. D. Fernando, H. Bagdi, Y. Hu, P. Yang, K. Gopalan, C. Kamhoua, and K. Kwiat, "Quick Eviction of Virtual Machines Through Proactive Live Snapshots", Full paper, IEEE/ACM International Conference on Utility and Cloud Computing (UCC) 2016, (Acceptance rate: 18%).
19. D. Williams, Y. Hu, U. Deshpande, P. Sinha, N. Bila, K. Gopalan, H. Jamjoom, "Enabling Efficient Hypervisor-as-a-Service Clouds with Ephemeral Virtualization", In International Conference on Virtual Execution Environments (VEE), 2016. (Acceptance Rate: 33.3%).
20. U. Deshpande, D. Chan, T-Y. Guh, J. Edouard, K. Gopalan, N. Bila, "Agile Live Migration of Virtual Machines", In International Conference on Parallel and Distributed Systems (IPDPS), 2016. (Acceptance Rate: 23%).
21. T. Li, Y. Hu, P. Yang, K. Gopalan, "Privacy Preserving Virtual Machine", In Annual Computer Security Applications Conference (ACSAC), 2015 (Acceptance rate: 24.5%).
22. Y. Hu, S. Panhale, T. Li, E.U. Kaynar, D. Chan, U. Deshpande, P. Yang, K. Gopalan, "Performance Analysis of Encryption in Securing the Live Migration of Virtual Machines", In IEEE Cloud (application track), 2015 (Acceptance rate: 20%)
23. U. Deshpande, Y. You, D. Chan, N. Bila, K. Gopalan, "Fast Server Deprovisioning through Scatter-Gather Live Migration of Virtual Machines", In IEEE Cloud (Research Track), Alaska, 2014 (Acceptance rate: 18%).
24. Y. Hu, T. Li, P. Yang, and K. Gopalan, "An Application-Level Approach for Privacy-preserving Virtual Machine Checkpointing", IEEE Cloud (Research Track), Santa Clara, CA, 2013 (Acceptance rate: 18%).
25. U. Deshpande, B. Schlinker, Eitan Adler, and K. Gopalan, "Gang Migration of Virtual Machines using Cluster-wide Deduplication", International Symposium on Cluster, Cloud and Grid Computing (CCGrid), Delft, The Netherlands, May 2013 (Acceptance rate: 22%).
26. X. Wang, S. Agham, V. Munishwar, V. Nipunage, S. Singh, K. Gopalan, "Transparent Network Protocol Testing and Evaluation", In the 22nd International Conference on Computer Communications and Networks (ICCCN), Nassau, Bahamas, July 2013 (Acceptance rate: 31%).
27. U. Deshpande, X. Wang, and K. Gopalan, "Live Gang Migration of Virtual Machines". In ACM Intl. Symposium on High Performance Distributed Computing (HPDC), June 2011. (Acceptance rate: 12.9%)
28. U. Deshpande, B. Wang, S. Haque, M. Hines, and K. Gopalan, "MemX: Virtualization of Cluster-wide Memory", In Proc. of International Conference on Parallel Processing (ICPP), September 2010. (Acceptance rate: 32%).
29. V. Rajanna, S. Shah, A. Jahagirdar, C. Lemoine, and K. Gopalan, "XCo: Explicit Coordination to Prevent Network Fabric Congestion in Cloud Computing Cluster Platforms". In ACM Intl. Symposium on High Performance Distributed Computing (HPDC), June 2010 (Acceptance rate: 25.3%)
30. M. Hines and K. Gopalan, "Post-Copy Based Live Virtual Machine Migration Using Adaptive Pre-

Paging and Dynamic Self-Ballooning", In ACM International Conference on Virtual Execution Environments (VEE), March 2009 (Acceptance rate: 32%).

31. C. Mitchell, V. Munishwar, S. Singh, X. Wang, K. Gopalan, N. Abu-Ghazaleh, "Testbed Design and Localization in MiNT-2: A Miniaturized Robotic Platform for Wireless Protocol Development and Emulation", In the International Conference on Communication Systems and Networks (COMSNETS), January 2009 (Acceptance rate: 17.4%).
32. N. Garepalli, K. Gopalan, and P. Yang, "Control Message Reduction Techniques in Backward Learning Ad Hoc Routing Protocols", In the International Conference on Computer Communication Networks (ICCCN) 2008, U.S. Virgin Islands, August 2008. (Acceptance rate: 26.1%, Best Paper Candidate).
33. J. Wang, K.-L. Wright, and K. Gopalan, "XenLoop: A Transparent High Performance Inter-VM Network Loopback", In ACM/IEEE Intl. Symposium on High Performance Distributed Computing (HPDC), Boston, MA, June 2008 (Acceptance rate: 17.5%).
34. N. Duffield, K. Gopalan, M. Hines, A. Shaikh, and J.E. van der Merwe, "Measurement Informed Route Selection", Short Paper, In Passive and Active Measurements Conference, Belgium, April 2007. (21 full and 12 short papers out of 80 submissions)
35. M. Lewandowski, M. Stanovich, T. Baker, K. Gopalan, and A. Wang, "Modeling device driver effects in real-time schedulability analysis: Study of a network driver", In Proc. of the 13th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) 2007, Bellevue, WA, April 2007. (28.4% acceptance rate)
36. A. Mahajan, N. Potnis, K. Gopalan, and A. Wang, "Modeling VANET Deployment in Urban Settings", In Proc. of the 10th ACM/IEEE International Symposium on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM), Chania, Crete Island, Greece, October 2007. Regular Paper. (24.8% acceptance rate)
37. Z. Duan, K. Gopalan, and X. Yuan, "Behavioral Characteristics of Spammers and Their Network Reachability Properties", In Proc. of the International Conference on Communications (ICC), Glasgow, UK, June 2007. (34.6% acceptance rate).
38. K. Gopalan, T. Chiueh and Y.J. Lin, "Network-Wide Load Balancing Routing With Performance Guarantees", In *Proc. of International Conference on Communications (ICC) 2006*, Istanbul, Turkey, June 2006. (39% acceptance rate).
39. Z. Duan, Y. Dong and K. Gopalan, "DMTP: Controlling Spam Through Message Delivery Differentiation", In *Proc. of IFIP Networking 2006*, Coimbra, Portugal, May, 2006. (20.4% acceptance rate).
40. M. Hines, J. Wang, and K. Gopalan, "Distributed Anemone: Transparent Low-Latency Access to Remote Memory", In Intl. Conf. on High Performance Computing (HiPC), Dec. 2006 (Acceptance rate: 15.5%).
41. K. Gopalan, T. Chiueh and Y.J. Lin, "Probabilistic Delay Guarantees Using Delay Distribution Measurement". In *Proc. of ACM Multimedia 2004*, New York, NY, October 2004. (16.6% acceptance rate).
42. S. Sharma, K. Gopalan, S. Nanda and T. Chiueh, "Viking: A Multi-Spanning-Tree Ethernet Architecture for Metropolitan Area and Cluster Networks". In *Proc. of IEEE INFOCOM'04*, Hong Kong, China, March 2004. (18.4% acceptance rate).
43. K. Gopalan, T. Chiueh and Y.J. Lin, "Delay Budget Partitioning to Maximize Network Resource Usage Efficiency". In *Proc. of IEEE INFOCOM'04*, Hong Kong, China, March 2004. (18.4% acceptance rate).
44. C. Li, G. Peng, K. Gopalan and T. Chiueh, "Performance Guarantee for Cluster-Based Internet Services", In *Proc. of 23rd IEEE International Conference on Distributed Computing Systems (ICDCS)*, Providence, Rhode Island, May 2003. (Acceptance rate: 17.7%).
45. S. Sharma, J. Chen, W. Li, K. Gopalan and T. Chiueh, "Duplex : A Reusable Fault-Tolerance Extension for Network Access Devices". Full paper. In Proc. of IEEE Intl. Conference on Dependable Systems and Networks (DSN) 2003, San Francisco, CA, June 2003. (Acceptance rate: 25.3%).
46. K. Gopalan and T. Chiueh, "Multi-Resource Allocation and Scheduling for Periodic Soft Real-Time Applications", In Multimedia Computing and Networking (MMCN), Jan. 2002. (Acceptance rate: 26.6%).
47. S. Sharma, K. Gopalan, N. Zhu, G. Peng, P. De, T. Chiueh, "Implementation Experiences of Bandwidth

Guarantee on a Wireless LAN", In ACM/SPIE Multimedia Computing and Networking (MMCN), Jan. 2002. (Acceptance rate: 26.6%).

48. K. Gopalan and T. Chiueh, "Improving Route Lookup Performance Using Network Processor Cache", In SC2002 High Performance Networking and Computing, Baltimore, Maryland, Nov. 2002. (Acceptance rate: 29.1%).
49. T. Chiueh, K. Gopalan, A. Neogi, C. Li, et. al., "Sago: A Network Resource Management System for Real-Time Content Distribution", In *Proc. of IEEE International Conference on Parallel and Distributed Systems (ICPADS)*, Taiwan, Dec. 2002. (62% acceptance rate).
50. S. Sharma, K. Gopalan, N. Zhu, G. Peng, P. De, T. Chiueh, "Quality of Service Guarantee on 802.11 Networks", In Hot Interconnects 9, Stanford, CA, August 2001.

Workshops

51. H. Bagdi, R. Kugve, K. Gopalan, "HyperFresh: Live Refresh of Hypervisors Using Nested Virtualization", ACM Asia-Pacific Workshop on Systems (APSys) 2017, Mumbai, India.
52. U. Deshpande, U. Kulkarni and K. Gopalan, "Inter-rack Live Migration of Multiple Virtual Machines", Proc. of the 6th International Workshop on Virtualization Technologies in Distributed Computing, Delft, The Netherlands, June 2012.
53. M. Gofman, R. Luo, P. Yang, and K. Gopalan, "SPARC: A Security and Privacy Aware Virtual Machine Checkpointing Mechanism", In ACM CCS Workshop on Privacy in the Electronic Society (WPES), full paper, 2011 (Acceptance rate: 16%).
54. Z. Lin, K. Gopalan, and P. Yang, "A case for Secure Virtual Append-only Storage for Virtual Machines", In the International Workshop on Security in Cloud Computing (SCC) San Diego, CA, USA, September 2010.
55. Y. Liu and K. Gopalan, "Interaction-Based Programming Towards Translucent Clouds", In Proc. of Workshop on Analysis and Programming Languages for Web Applications and Cloud Applications, Toronto, Canada, June 2010.
56. V. Rajanna, S. Shah, A. Jahagirdar and K. Gopalan, "XCo: Explicit Coordination for Preventing Congestion in Data Center Ethernet", In Proc. of 6th IEEE International Workshop on Storage Network Architecture and Parallel I/Os, Incline Village, NV, USA, 2010.
57. V. Munishwar, S. Singh, X. Wang, C. Mitchell, K. Gopalan, and N. Abu-Ghazaleh, "On the Accuracy of RFID-based Localization in a Mobile Wireless Network Testbed", In the IEEE PerCom Workshop on Pervasive Wireless Networking (PWN 2009), Galveston, TX, March 2009.
58. N. Potnis, A. Mahajan, K. Gopalan, and A. Wang, "Evaluation of Mesh-Enhanced VANET Deployment Models", In Proc. of the ICCCN'07 Workshop on Advanced Networking and Communications, Honolulu, Hawaii, August 2007.
59. K. Gopalan, T. Chiueh, and Y. Lin, "Load Balancing Routing of Fault Tolerant QoS-Guaranteed VPNs", In Proc. of the International Workshop on Quality of Service (IWQoS), Evanston, IL, June 2007. (Acceptance rate 26.5%).
60. K. Gopalan and K.D. Kang, "Coordinated Allocation and Scheduling of Multiple Resources in Real-time Operating Systems", In Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT), Pisa, Italy, July 2007.
61. M. Hines and K. Gopalan, "MemX: Supporting Large Memory Workloads in Xen Virtual Machines", In Proc. of the International Workshop on Virtualization Technology in Distributed Computing (VTDC), Reno, NV, November 2007.
62. A. Mahajan, N. Potnis, K. Gopalan, and A. Wang "Urban Mobility Models for Vehicular Ad Hoc Networks", In Workshop on Next Generation Wireless Networks (WoNGeN'06), Dec 2006. (Acceptance rate: 36%).
63. M. Hines, M. Lewandowski, J. Wang, and K. Gopalan, "Anemone: Transparently Harnessing Cluster-wide Memory", Proc. of the International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS), Calgary, Canada, July 2006.
64. Z. Duan, K. Gopalan, Y. Dong, "Push vs. Pull: Implications of Protocol Design on Controlling Unwanted Traffic", In USENIX Symp. on Reduction of Unwanted Internet Traffic (SRUTI) Workshop,

MIT, Cambridge, MA, July 2005. (Acceptance rate: 37%).

65. Z. Duan and Y. Dong and K. Gopalan, "A Differentiated Message Delivery Architecture to Control Spam", In ICPADS Workshop on Security in Networks and Distributed Systems (SNDS05), Fukuoka, Japan, July 2005.
66. K. Gopalan and T. Chiueh, "Measurement-based Per-flow Statistical Delay Guarantees", In 2nd New York Metro Area Networking Workshop, Columbia University, New York, NY, September 2002.
67. P. Pradhan, K. Gopalan and T. Chiueh, "Design Issues in System Support for Programmable Routers", In 8th Workshop on Hot Topics in Operating Systems (HotOS-VIII), May 2001. (Acceptance rate: 22%).
68. P. Pradhan, T. Chiueh and K. Gopalan, "Integrated Scheduling of Multiple Resources in Shared Network Servers", First New York Metro Area Networking Workshop, IBM TJ Watson Research Center, Hawthorne, New York, March 2001.

Patents

1. US 10,156,986 B2, K. Gopalan, U. Deshpande, "Gang migration of virtual machines using cluster-wide deduplication", Issued Dec 18, 2018.
2. US 9,823,842, K. Gopalan, U. Deshpande, "Gang migration of virtual machines using cluster-wide deduplication", Issued Nov 21, 2017.
3. US 9,798,567, Y. Hu, K. Gopalan, "Multi-hypervisor virtual machines", Issued Oct 24, 2017.
4. US 9,552,495, P. Yang, K. Gopalan, "System and method for security and privacy aware virtual machine checkpointing", Issued Jan 24, 2017.
5. US 9,372,726 K. Gopalan, "Gang Migration Of Virtual Machines Using Cluster-wide Deduplication", Issued Jun 21, 2016.
6. US 9,069,782, P. Yang, K. Gopalan, "System and method for security and privacy aware virtual machine checkpointing", Issued June 30, 2015.
7. US 8,935,506, K. Gopalan, "MemX: Virtualization of Cluster-wide Memory", Issued January 13, 2015.
8. US 8,417,789, K. Gopalan, M. Hines, J. Wang, "The Distributed adaptive network memory engine", Issued April 9, 2013.
9. US 8,291,034, K. Gopalan, M. Hines, J. Wang, "Centralized adaptive network memory engine", Issued October 16, 2012.
10. US 8,280,976, K. Gopalan, M. Hines, J. Wang, "The Distributed adaptive network memory engine", Issued October 2, 2012.
11. US 7,917,599, K. Gopalan, M. Hines, J. Wang, "The Distributed adaptive network memory engine", Issued March 29, 2011.
12. US 7,925,711, K. Gopalan, M. Hines, J. Wang, "Centralized adaptive network memory engine", Issued April 12 2011.
13. US 8,046,425, K. Gopalan, M. Hines, J. Wang, "The Distributed adaptive network memory engine", Issued October 25, 2011.

Service

Chairing and Organization:

1. Associate Editor, IEEE Transactions on Cloud Computing, 2017–present.
2. Associate Editor, MDPI Computers, ISSN 2073-431X, MDPI, 2016–2018.
3. Program Chair, IEEE International Conference on Networking, Architecture, and Storage (NAS 2018).
4. Session Chair, ACM Asia Pacific Systems Workshop (APSys) 2017.
5. Session Chair, High Performance Parallel and Distributed Computing (HPDC), 2014.
6. Website Chair, IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS) 2014

7. Session Chair, Networks Session, High Performance Parallel and Distributed Computing (HPDC), 2013.
8. Steering Committee Member, The 6th International Workshop on Virtualization Technologies in Distributed Computing (VTDC), 2012, Delft, The Netherlands.
9. Primary representative to I3P from Binghamton University, 2012–2016.
10. Publications Chair, Infocom 2011.
11. Workshop Program Chair, The 5th International Workshop on Virtualization Technologies in Distributed Computing (VTDC), 2011, San Jose CA.
12. Publications Chair, The International Conference on Computer Communications and Networks (ICCCN) 2012, Munich, Germany.
13. Publications Chair, The International Conference on Computer Communications and Networks (ICCCN) 2011, Hawaii, USA.
14. Publications Chair, The International Conference on Computer Communications and Networks (ICCCN) 2010, Zurich, Switzerland.
15. Publications Chair, The International Conference on Computer Communications and Networks (ICCCN) 2009, San Francisco, CA.
16. Session Chair, Next Generation Routing and Router Design Session, International Conference on Communication Systems and Networks (COMSNETS) 2009, Bangalore.
17. Program Co-chair, Network Algorithms and Performance Evaluation Symposium at the ICCCN 2008, St. Thomas, U.S. Virgin Islands.
18. Session Chair, Network Measurements and Performance Evaluation Session at ICCCN 2008, St. Thomas, U.S. Virgin Islands.
19. Session Chair, MANETs Session, International Symposium on Modeling, Analysis, and Simulation of Wireless and Mobile Systems (MSWIM), Crete Island, Greece, November 2007.
20. Program Co-chair, Network Algorithms and Performance Evaluation Symposium at the ICCCN 2007, Honolulu, Hawaii.
21. Session Chair, Application Software Session, International Conference on High Performance Computing (HiPC), Bangalore, India, December 2006.
22. Program Co-chair, International Workshop on Network Design and Architecture (IWNDA) at the International Conference on Parallel Processing (ICPP) 2004, Montreal, Canada.

Panel and Proposal Reviews

1. Panel Reviewer for National Science Foundation 2008, 2009, 2014, 2017, 2018.
2. American Association for Advancement of Sciences, 2010
3. Air Force Office of Scientific Research, 2009.

Program Committee Memberships:

HPDC 2019, 2018, 2014, 2011; IPDPS 2019, 2018, 2017 IC2E 2018, 2015, 2014; APSys 2017, MASCOTS 2018, 2017 ICDCS 2017/2016, CCGRID 2017, IEEE Cluster 2017, Workshop on Assured Cloud Computing 2017, IEEE International Conference on High Performance Computing and Communications (HPCC) 2017, Mathematical Methods, Models and Architectures for Computer Networks Security (MMM-ACNS) 2017, ICPP 2016/2013/2009; CCGrid 2015, 2013; COMSNETS 2016/2009; CyberSecurity 2015/2014/2012; Network-aware Data Management 2015; VTDC 2010-2015; CloudCom 2012-2014; ICPADS 2013-2015; BigData 2014; Big Data Science and Engineering 2013, ICNC 2013/2012; MSWIM 2007-2011/2015; PriSec 2012-2014; PIMRC 2013/2008; Broadnets 2012/2007; Thermal Modeling and Management (TEMM) 2011, CloudSec 2011, IEEE Real Time Systems Symposium (RTSS) 2009, HiPC 2009/2006; Globecom 2010/2011/2006; Workshop on Security in Cloud Computing 2010/2009; International Conference on Computer Communications and Networks (ICCCN) 2009/2006/2005/2004, WINSYS 2009; IEEE International Symposium on Ubisafe Computing 2009; ICC 2008–2012; WoNGEN 2008; ICDCN 2007/2008; Advanced Networks and Telecommunication Systems (ANTS) 2007/2008; International Conference on Communications in Computing (CIC) 2008 Intl. Conf. on Distributed Computing and Networking (ICDCN) 2007; Intl. Workshop on Wireless Ad hoc & Sensor Network (IWWAN) 2006; ACM Southeast Conf. (ACMSE) 2006; Industrial Conf. on Multi-Provider QoS/SLA Internetworking (MPQSI) 2005; Trusted Internet Workshop (TIW) 2005/2004;

Intl. Conf. on Distributed Computing & Internet Technology (ICDCIT) 2004.

Reviewer : *(In addition to reviews as part of Program Committees above)*
USENIX Annual Technical Conference (ATC) 2017, Journal of Parallel and Distributed Computing (JPDC) 2014–2017, IEEE Transactions on Cloud Computing 2014–2017, Journal of Computer Networks 2016 ACM Transactions on Code Optimiation (TACO) 2015, IEEE Cloud Computing 2015, IEEE Transactions on Computers 2014/2012/2011, IEEE Internet Computing 2012/2014, Journal of Computer Networks 2014-2015, IEEE Transactions on Emerging Topics in Computing 2014, International Journal of Software and Informatics 2014, SIGOPS Operating Systems Review 2013, Journal of Parallel Computing 2013, Future Generation Computer Systems 2012, IEEE Transactions on Parallel and Distributed Systems 2012/2011, Journal of Grid Computing 2012/2011, IEEE/ACM Transactions on Networking 2010, Journal of Network and Systems Management 2010, Real-Time Systems Journal 2010, IEEE Transactions on Computers 2009, UbiSafe 2009, PACT 2009, Journal of Computer Networks 2008, IEEE Transactions on Vehicular Technology 2008, Journal of Network and Computer Applications 2008, IEEE Communications Letters 2007, International Conference on Dependable Systems and Networks (DSN) 2007, IEEE Transactions on Multimedia Computing Communications and Applications 2007, IEEE Transactions on Wireless Communications 2007, IEEE Journal on Selected Areas in Networking 2007, Workshop on Service Oriented Computing Performance 2007, IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) 2007, Journal of Wireless Networks 2007, IEEE Communication Surveys and Tutorials 2007, International Conference on Computer Communications and Networks 2007, Journal of Ad Hoc Networks 2007, Journal of Computer Networks 2006, IEEE Transactions on Communications 2006, Computer Networks Journal 2006, IEEE Communications Letters 2006, Mobile Computing and Communications Review (MC2R) 2006, Journal of Systems and Software 2006, ICNP 2006, ACM SAC 2006, ICDCS 2006, IPDPS 2006, OPODIS 2006, ICT 2006, ICNP 2005, IEEE Transactions on Communications 2005, IEEE Infocom 2005, QShine 2005, Journal of Interconnection Networks (JOIN) 2005, Intl. Conf. on Parallel Processing (ICPP) 2005, Mobile Computing and Communications Review (2005), IEEE Real-Time Systems Symp. (RTSS) 2004, ACM SAC 2005, ICC 2005, IEEE Infocom 2004, Computer Networks Journal 2004, QShine 2004, ICCCN 2004, TIW 2004, IWNDA 2004, ACM SAC 2004, University of Missouri Research Board (UMRB) 2004, IEEE Globecom 2003, Journal of Parallel and Distributed Computing 2003, IEEE Transactions on Networking 2002, New York Metro Area Networking Workshop 2002.

External Dissertation Evaluator:

- Ph.D. Thesis in Computer Science, Indian Institute of Technology, Chennai, 2018.
- Ph.D. Thesis in Computer Science, Indian Institute of Technology, Chennai, 2009.
- Ph.D. Thesis in Computer Science and Engineering, Dr. M.G.R. Educational And Research Institute University, 2012.

Teaching and Mentoring

Courses Taught

1. 2006–2018, CS 550/552, Graduate Operating Systems, 600+ students, 3 credits.
2. 2009–2017, CS 350, Undergraduate Operating Systems, 300+ students, 4 credits.
3. 2007, 2010–2012, CS680V/652, Virtualization, 33 students, 3 credits.
4. Summer 2006, CIS4930/COP5641, Linux Kernel and Device Driver Programming, 30 students, 3 credits.
5. Spring 2006, COP 4530/CGS 5425, Data Structures, Algorithms and Generic Programming, 23 students, 3 credits.
6. Fall 2005, CDA 4503, Introduction to Computer Networks, 9 students, 3 credits.
7. Fall 2005, COP 5570, Advanced Unix Programming, 25 students, 3 credits.
8. Fall 2004, COP 5570, Advanced Unix Programming, 28 students, 3 credits.
9. Fall 2004, CEN 4516, Distributed Systems and Networks, 11 students, 3 credits.

10. Spring 2004, COP 4530/CGS 5425, Data Structures, Algorithms and Generic Programming, 20 students, 3 credits.
11. Fall 2003, COP 5570, Advanced Unix Programming, 30 students, 3 credits.
12. Fall 2002, CSE 533, Network Programming, 40 students, 3 credits.
13. Additionally, supervised numerous credits hours of Independent Study, Ph.D. Dissertation, and MS Thesis/projects that are not individually listed here.

Dissertation/Thesis/Project Supervision

1. Michael R. Hines, 2009, Placement: IBM Watson Research Labs, Yorktown Heights, NY. Also NSF Computing Innovation Fellow in 2009 at Columbia University
2. Jian Wang, 2010, Placement: Hewlett Packard.
3. Xiaoshuang Wang, 2013, Placement: FireEye
4. Umesh Deshpande, 2015), Placement: IBM Research Labs, Almaden, CA. Recipient of Binghamton University Graduate Student Excellence in Research Award 2015.
5. Yaohui Hu, 2017, Placement: Microsoft.
6. Tianlin Li, 2018, Co-advised with Dr. Ping Yang, Placement: St. Mary's University.
7. Dinuni Fernando, Co-advised with Dr. Ping Yang, current.
8. Spoorti Doddamani, current.
9. Ozgur Kilic, current.
10. Kevin Cheng, current.
11. Piush Sinha, current.
12. Mentored 38 MS Thesis/Projects.
13. Mentored 21 Undergraduate REU Students, many of whom joined MS and Ph.D. programs.
14. Member of 50+ Ph.D./M.S. Thesis committees.

Outreach to Local High Schools : (2009–2014): As part of my NSF CAREER grant, I initiated and organized yearly Summer Research Internship program in Computer Science for 24 local high school students.