Sachin Shetty

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Department of Electrical and Computer Engineering
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Education

- Ph.D., Modeling and Simulation, August 2007, Old Dominion University
- M.S., Computer Science, August 2002, University of Toledo
- B.E., Computer Engineering, August 1998, University of Mumbai, Mumbai, India.

Professional Interests

My research lies at the intersection of computer networking, network security and machine learning. As a network systems researcher, I am interested in exploring fundamental networking, communication and security issues in diverse networked computing platforms. Topics of interest include the following: Secure Cloud Computing, Cognitive Radio Networking, IP Geolocation, and Network measurement and mapping.

Professional Experience

- **Assistant Professor**, Department of Electrical and Computer Engineering, Tennessee State University, August 2009 – Present
- **Assistant Professor**, Department of Electrical and Computer Engineering, Rowan University, August 2008-July 2009
- **Visiting Assistant Professor**, Department of Electrical and Computer Engineering, Old Dominion University, August 2007- July 2008
- **Graduate Research Assistant**, Wireless Communications and Networking Lab, Old Dominion University, August 2002- July 2007
- **Graduate Research Assistant**, Ohio Computing and Communications ATM Research Network Lab, University of Toledo, August 2000 – July 2002
- **Software Developer**, Tata Infotech Limited, Mumbai, India, August 1998 – July 2000

Selected Journal Publications

- Sachin Shetty, Meena Thanu, Ravi Ramachandran, "Cognitive Radio: Primary User Emulation Attacks and Remedies", Journal of Recent Patents on Computer Science, Special Issue on Recent Advances in Cognitive Radio Communications, Bentham Science Publishers Ltd., Vol.5, No. 2, pages 103-108, May. 2012.
- Ying Tang, Sachin Shetty, Talbot Bielefeldt, Kauser Jahan, John Henry, and S. Keith Hargrove, "Sustain City - A Cyberinfrastructure-Enabled Game System for Science and Engineering Design", Journal of Computational Science Education, Vol 3. Issue 1, pages 57-65, May 2012
- Ying Tang, David Carbonetta, Sachin Shetty, "Development of an Integrated Network Visualization and Graph Analysis Tool for Biological Networks", Int. J. Computational Biology and Drug Design, Vo. 5, No. 2, June 2012.

- Sachin S. Shetty, Ying Tang and William Collani, "A Cross-Layer Packet Loss Identification Scheme to Improve TCP Veno Performance", International Journal of Computer Networks, Volume 1, Issue 1, pages 36-45, November 2009
- Gayathri Shivaraj, Min Song and Sachin S. Shetty, "Using Hidden Markov Models to detect Rogue Access Points", *Security and Communication Networks*, Volume 3, Issue 5, pages 394–407, October 2010.
- Sachin S. Shetty, Ying Tang and William Collani, "A Cross-Layer Packet Loss Identification Scheme to Improve TCP Veno Performance", *International Journal of Computer Networks*, Volume 1, Issue 1, pages 36-45, November 2009
- Sachin Shetty, Min Song, Youjun Yang, and Mary Mathews, "Learning Bayesian Network over Distributed Databases Using Majority-based Method", *Journa*l *o*f *Computationa*l *Method*s *i*n *Scienc*e *an*d *engineerin*g , Volume 9 Issue 1,Pages 53-68, April 2009.
- Mary Mathews, Min Song, Sachin Shetty, and Rick McKenzie, "Detecting Compromised Nodes in Wireless Sensor Networks", *Internationa*l *Journa*l *o*f *Computer an*d *Informatio*n *Scienc*e *(IJCIS)*, vol. 9, no. 1, Jan 2008.
- Min Song, Sachin Shetty, and Deepthi Gopalpet, "Coexistence of 802.11b and Bluetooth: An Integrated Performance Analysis", *Mobile Networks and Applications* vol. 12, Issue 5, Pages 450-459 Dec 2007.

Selected Conference Proceedings and Book Chapters

- Umashanger Thayasivam, Sachin Shetty, Chinthaka Kuruwita, Ravi Ramachandran, "Detection of Anomalies in Network Traffic Using L2E for Accurate Speaker Recognition", 55th Int'l Midwest Symposium on Circuits & Systems, Boise, August 2012.
- Hellen Maziku, Sachin Shetty, Tamara Rogers, "Enhancing the Classification Accuracy of IP Geolocation", , Proc. of Military Communications Conference, Orlando, Florida, Nov 2012.
- Nicholas Luna, Sachin Shetty, Tamara Rogers, Kaiqi Xiong, "Assessment of Router Vulnerabilities on PlanetLab Infrastructure for Secure Cloud Computing", First GENI Research and Educational Experiment Workshop, March 15-16, 2012, Los Angeles
- Hellen Maziku, Sachin Shetty, Tamara Rogers, "Measurement-based IP geolocation of Routers on PlanetLab Infrastructure", First GENI Research and Educational Experiment Workshop, March 15-16, 2012, Los Angeles
- Sachin Shetty, Nicholas Luna, Kaiqi Xiong, "'Assessing Network Path Vulnerabilities for Secure Cloud Computing", IEEE ICC Workshop on Clouds, Networks and Data Centers, June 10-15, 2012, Ottawa, Canada.
- Sachin Shetty, Sai Kiran Mukkavilli, L.H. Keel, "An integrated machine learning and control-theoretic method for mining concept drifting data streams", IEEE HST, Nov 14-17, 2011, Boston.
- Sachin Shetty, Kodzo Agbedanu, Ravi Ramachandran, "Opportunistic Spectrum Access in Multi-User Multi-Channel Cognitive Radio Networks," IEEE EUSIPCO, August 29 - Sep 2, 2011, Barcelona, Spain,
- Y. Tang, Sachin Shetty, "Adaptive Virtual Reality Game System for Personalized Problem Based Learning," 2011 IEEE International Conference on Networking, Sensing and Control, April 11-13, 2011, Delft, Netherlands.
- McKenzie McNeal III, Wei Chen, Sachin Shetty, Stanley Aungst, "Security-Oriented Robust Networking Architecture and Key Management for Heterogeneous Wireless Sensor Networks", 2011 International Conference on Wireless Networks,July 18-21, 2011, Las Vegas, USA

- Y. Tang, Sachin Shetty, J. Kauser, S.K.Hargrove, and J. Henry, "Virtual Reality Games in Promoting Metacognition for Science and Engineering Design in Context," ASEE Annual Conference, June 26-29, 2011, Vancouver, BC, Canada
- Saleh Zein-Sabatto, Abduliqadir Khoshnaw, Sachin Shetty, Mohan Malkani, Atindra K. Mitra, "Cross layers decision fusion model in layered sensing systems," Proc. of SPIE, Apr 2011
- Tang, Y., Sachin Shetty, and Chen, X. F, "Empowering Students with Engineering Literacy and Problem-solving through Interactive Virtual Reality Games," 2nd International IEEE Consumer Electronics Society Games Innovation Conference, Hong Kong, Dec. 21-23, 2010.
- Sachin Shetty, Ying Tang, William Collani, "TCP Venoplus - A cross-layer approach to improve TCP Performance in wired-cum-wireless networks using signal strength", Proc. of IEEE Networking, Sensing and Control, June 2010.
- Sachin Shetty and Ravi Ramachandran, "Blind Channel Estimation Based Robust Physical Layer Key Generation in MIMO Networks", *IEEE Int. Symp. On Circuits and Systems*, Paris, France, June 2010.
- Chunsheng Xin, Min Song, Liangping Ma, Sachin Shetty, and C.C. Shen, "Control-Free Dynamic Spectrum Access for Cognitive Radio Networks," *Proc. of IEEE ICC*, May 2010.
- Gang Zhou, Sachin Shetty, George Simms, Min Song, "PLL Based Time Synchronization in Wireless Sensor Networks", IEEE International Conference on Embedded and Real- Time Computing Systems and Applications (RTCSA) (short paper), Beijing, China, August 2009
- Sachin Shetty, Min Song, Chunsheng Xin, "A Learning-based Multiuser Opportunistic Spectrum Access Approach in Unslotted Primary Networks", IEEE INFOCOM, April 2009
- Sachin Shetty, Min Song, Liran Ma, "Rogue Access Point Detection by analyzing network traffic characteristics," *Proc. of the 2007 Military Communications Conference*, October 2007, Orlando, Florida.
- Sachin Shetty, Min Song, R. Ash, E. Ancel, and K. Bone, "Wireless sensor payload design for sounding rocket," *Proc. of the ISCA 22nd International Conference Computers and their Applications*, March 2007.
- Sachin Shetty, Min Song, and M. Alam, "Data Mining of Bayesian Network Structure Using a Semantic Genetic Algorithm-Based Approach," *Bayesian Network Technologies: Applications and Graphical Models*, Idea Group, Inc., 2007.
- Min Song, and Sachin Shetty, "Modeling Scale-Free Networks with Heterogeneous Nodes," *Proc. of the 18th IASTED International Conference on Parallel and Distributed Computing Systems*, Dallas, TX, , November 13-15, 2006.
- Min Song, Sachin Shetty, Wu Li, "Fair and Smooth Scheduling for Virtual Output Queuing Switches Achieving 100% Throughput," Lecture Notes in Computer Science, Volume 3619, Sep 2005.
- Sachin Shetty, Min Song; "Accurate learning of Bayesian networks using Genetic Algorithms", *Proc. of 3rd International Conference on Information Technology: Research and Education*, June 2005, Hsinchu, Taiwan.
- Min Song, Sachin Shetty, Mansoor Alam, and H.J. Yang, "A New Multicast Queuing Mechanism for High-Speed Packet Switches," *Proc. of the 17th International Conference on Parallel and Distributed Computing Systems*, September 15-17, 2004, San Francisco.

- Min Song, Sachin Shetty, Weiying Zhu; "Evolutionary Programming in a Distributed Scheduler Architecture", *Proc. of 16th International Conference on Computer Applications in Industry and Engineering*, Las Vegas, November, 2003.

Sponsored Research Activities

While at Tennessee State University, I have been involved with a total of $4.2 million in sponsored research. I have received $2,411,836 of external support as Principal Investigator. As a Co-Principal Investigator, I have participated in projects which totaled $1,501,000 of external support.

Funded Proposals as Principal Investigator

1. 2012 AWS Education Grant
   Award Allotment: $1,200; *Duration:* 12 months
   Sponsoring Agency: Amazon; *Role:* PI

2. 2011 AFRL Visiting Faculty Fellowship Program, Rome
   Award Allotment: $25,000; *Duration:* 6 months
   Sponsoring Agency: AFRL; *Role:* PI

3. Collaborative Research: TUES: Vertical Integration of Concepts and Laboratory Experiences in Biometrics Across the Four Year Electrical and Computer Engineering Curriculum
   Award Allotment: $131,080; *Duration:* 4 years (2011-2015)
   Sponsoring Agency: NSF; *Role:* PI

4. Network Measurement and Mapping
   Award Allotment: $500,000; *Duration:* 5 years (2011-2016)
   Sponsoring Agency: DHS; *Role:* PI

5. Research Initiation Grant: Secure Measurement-Based IP Geolocation for Cloud Auditing",
   Award Allotment: $199,755; *Duration:* 2 years (2011-2013)
   Sponsoring Agency: NSF; *Role:* PI

6. Protect the Nation's Critical Infrastructure and Key Assets through an Integrative Education, Research and Professional Development at Tennessee State University
   Award Allotment: $301,659; *Duration:* 5 years (2011-2016)
   Sponsoring Agency: DHS; *Role:* PI

Funded Proposals as Co-Principal Investigator

7. Targeted Infusion Grant: Cyber Security Education and Research Training for ECE and CS programs
   Award Allotment: $299,805; *Duration:* 3 years (2011-2014)
   Sponsoring Agency: NSF; *Role: Co*-PI

8. Control Theoretic and Supervised Machine Learning Based Approach for Intrusion Detection in Mobile Wireless Networks
   Award Allotment: $25,000; Duration: 1 year (2010)
   Sponsoring Agency: AFOSR; Role: Co-PI

9. Targeted Infusion Grant: Development of a Virtual and Augmented Reality Laboratory for Research and Education at Tennessee State University
   Award Allotment: $299,575; Duration: 3 years (2010-2013)
   Sponsoring Agency: NSF; Role: Co-PI

10. CI-TEAM Demonstration: Interactive and Collaborative Learning Environment using Virtual Reality Games Promoting Metacognition for Science and Engineering Design in Context"
    Award Allotment: $250,000; Duration: 3 years (2010-2013)
    Sponsoring Agency: NSF; Role: Co-PI

11. Tennessee Rising Stars
    Award Allotment: $125,000; Duration: 3 years (2010-2013)
    Sponsoring Agency: TBR; Role: Co-PI

12. Empowering Students with Engineering Literacy and Systematic Problem Solving through Interactive and Cost-Effective Games
    Award Allotment: $199,986; Duration: 3 years (2009-2012)
    Sponsoring Agency: NSF; Role: Co-PI

13. Collaborative Data Capturing, Sharing and Analysis for Cloud Security
    Award Allotment: $19,717; *Duration:* 1 year (2011-2012)
    Sponsoring Agency: AFOSR; *Role:* Co-PI

TEACHING EXPERIENCE

Tennessee State University

- Graduate Courses
  - Data Communication and Computer Networks
  - Network Security
- Undergraduate Courses
  - Engineering Programming
  - Advanced Programming Laboratory

Rowan University

- Graduate Courses
  - Introduction to Computer Networks
  - Wireless Networks
- Undergraduate Courses
  - Networks II
  - Electronics I

Old Dominion University

- Graduate Courses
  - Engineering Systems Modeling

        - Introduction to Modeling and Simulation
    - Undergraduate Courses
        - Introduction to Computer Networks and Data Communications
        - Network Engineering and Design

Invited Talks

- "Massive IP/DNS analysis using data mining in Hadoop", Cloud Assumption Buster Workshop, NIST, Gaithersburg, MD, Oct 21, 2011
- "Challenges and Success Stories in Homeland Security Education", Panel Member, DHS Center of Excellence Annual Meeting, Purdue University, West Lafayette, IN, Sep 13, 2011
- "Massive Cloud Auditing using Data Mining in Hadoop", Assured Cloud Workshop, Information Institute, AFRL, Rome, NY, July 7, 2011
- **"**Opportunistic Networking via Dynamic Spectrum Access", LANS Informal Seminar, Argonne National Laboratory, Jul 7 2010.
- **"**Opportunistic Access in Cognitive Radio Networks**",** Department of Electrical and Computer Engineering, Old Dominion University, Oct 3, 2008.
- "Wireless Spacecraft Bus", Department of Electrical and Computer Engineering, Old Dominion University, Oct 28, 2007.
- "Wireless Spacecraft Research", Salisbury University, May 9, 2007.
- "Wireless Spacecraft Communications" 6th Integrated Communications, Navigation, and Surveillance (ICNS), Baltimore, Maryland, May 1-3 2006.
- "Weighted Fair Queuing Algorithm", Gigabit Kits Workshop hosted by Washington University Sponsored by the National Science Foundation, June 2002.

Awards

- 2011 DHS Scientific Leadership Award
- 2010 NSF/DoE FaST (Faculty Student Team) Fellowship
- Outstanding Teaching Instructor for College of Engineering, Old Dominion University, 2007.
- First place poster at the joint Old Dominion University, Eastern Virginia Medical School and Norfolk State University Research Exposition Poster Presentation, March 2006.
- Dean's Award for Outstanding Research, College of Engineering, Old Dominion University, March 2006.

Services

Reviewer - International Journal of Biometrics and BioInformatics, Journal of Security and Communication Networks, IEEE Transactions on parallel and distributed computing, IEEE Trans on Evolutionary Computation ; IEEE Transactions on Wireless Communications; IEEE ICC'08 '09'10; ChinaCOM'07; IEEE GLOBECOM'08, ITRE'05; IEEE HPSR '08 '06, '05 ITRE '05, GC '07 '08, INFOCOM '09 '10

Program Committee: CNS 2009,HPSR 2008

Guest Editor: SI on Information Dissemination and New Services in P2P Systems

Associate Editor-in-Chief: International Journal of Computer Networks, CSC Press, 2009–present.

Publications/Web Chair: IEEE Workshop on High Performance Switching and Routing, 2008.