Xiaojun (Matt) Cao

Professor

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I. Education

Ph.D. 2004, The State University of New York at Buffalo, Buffalo, NY USA
Computer Science
Thesis: *Waveband Switching in Wavelength Division Multiplexing Networks*
Advisor: Chunming Qiao

M.S. 1999, Institute of Acoustics, Chinese Academy of Sciences, Beijing, China
Electrical Engineering
Thesis: *Optimizing Data Transmission in the DVB system*
Advisor: Ziqiang Hou

B.S. 1996, Tsinghua University, Beijing, China
Engineering Physics

II. Professional Credentials

- **Professor**, 08/2016 – present, Department of Computer Science, Georgia State University, Atlanta, GA
- **Director of Graduate Studies**, 08/2023 – present, Department of Computer Science, Georgia State University, Atlanta, GA
- **Director of Graduate Studies**, 08/2017 – 08/2019, Department of Computer Science, Georgia State University, Atlanta, GA
- **Acting Director of Graduate Studies**, 12/2013 – 08/2017, Department of Computer Science, Georgia State University, Atlanta, GA
- **Associate Professor**, 08/2010 – 07/2016, Department of Computer Science, Georgia State University, Atlanta, GA
- **Assistant Professor**, 08/2007 – 07/2010, Department of Computer Science, Georgia State University, Atlanta, GA
- **Assistant Professor**, 07/2004 – 08/2007, College of Computing and Information Sciences, Rochester Institute of Technology, Rochester, NY

- **Research Assistant**, 08/2001 – 07/2004, Department of Computer Science & Engineering, The State University of New York at Buffalo, Buffalo, NY
- **Software Engineer**, 05/2001 – 08/2001, Brilliant Optical Networks, LLC, Bridgewater, NJ
- **Teaching Assistant**, 09/1999 – 05/2001, Department of Computer Science & Engineering, The State University of New York at Buffalo, Buffalo, NY
- **Software Engineer**, 05/2000 – 08/2000, Cymfony, Inc. Williamsville, NY
- **Software Engineer**, 07/1995 – 05/1997, Beijing Electronical Institute of Asia-Pacific, Beijing, China
- **Research Assistant**, 09/1996 – 09/1999, DSP (Digital Signal Processing) Center, Institute of Acoustics, Chinese Academy of Sciences, Beijing, China

III. Scholarship and Professional Development

A. Grants and Funding

1. "T-Challenge 2024: Gerative AI for Reliable Service Function Deployments," **T-Mobile,** $149,952.00, 2024 – 2025, **PI** (pending)
2. "Investigating BigData Applications in Cyber-Physical Systems (CPS)," University of Electronic Science and Technology of China (**UESTC**), $45,000.00, 09/2015 – 8/2022, **PI**
3. "Advancements and Universal Usability for Epi-Info Product Suite," **Centers for Disease Control and Prevention (CDC)**, $264,816.00, 09/2016 – 12/2017, **Co-PI**, with Dr. Anu Bourgeois (PI) and Raj Sunderraman (Co-PI)
4. "Design and Analysis of Spectrum-sliced Elastic Optical Path Networks," **National Science Foundation (NSF)** (CNS-1117229), $197,723.00, 09/2011 – 12/2015, **PI**
5. "Teaching Programming Classes in a Blended Model", **Center for Instructional Innovation, GSU**, $30,467.00, 07/2013 – 07/2014, **PI**
6. ONTC meeting at OFC'14, **Huawei** Enterprise Co., $1939.04, 2014, **PI**
7. International Workshop on Optical Networking (iWON 2013), **GSU** Conference Grants, $1900.00, 2013, **PI**
8. International Workshop on Optical Networking (iWON 2013), **Huawei** Enterprise Co., $1000.00, 2013, **PI**
9. "REU: Multi-granular Switching in Optical Networks," **National Science Foundation (NSF)** (CNV-007805), $7,810.00, 12/2009 – 11/2010, **PI**
10. GSU Faculty Development Grant, $800.00, Dec. 2009
11. "CAREER: A Design of Multi-granular Switching Framework for Optical Networks," **National Science Foundation (NSF)** (CNS-0813555), $400,000.00, 2006-2011, **PI**
12. "Advanced Networking Infrastructure Projects for Computing and Collaboration," **Cisco** Research, $78,000.00, 2008 - 2009, **PI** for GSU with Dr. G. Khanna of RIT (GSU's Share is $15,000.00)
13. "Optimizing Resource Utilization in Wireless Optical Mesh Networks," **GSU RIG**, $9,884.00, 2008-2009, **PI**
14. GSU Faculty Development Grant, $800.00, Dec. 2008

15. GSU Research Travel Grant supporting a trip to National Science Foundation (NSF) to facilitate the acquisition of extramural funds for a new research project from NETs, $750.00, Oct. 2008

16. "Reliable and Prioritized Wireless Sensor & Actor Networks for Industrial Control," **IBM** Shared University Research (SUR) program, $75,000.00, 2006-2007, **Co-PI**, with Dr. Nirmala Shenoy of RIT as PI

17. "Topology Design and Optimization of High-speed Optical Wireless Communication Networks," RIT FEAD program, $4,800.00 2005-2006, **PI**

18. "Multi-disciplinary Training on Wireless Ad Hoc & Sensor Networks via Integrated Hardware/Software Experiments," RIT PLIG program, $12,711.00, 2005-2006, **PI**, with Dr. Nirmala Shenoy and Dr. Fei Hu as Co-PIs

B. Refereed Journal Articles

(Notes: (a). Except for the papers listed below that are marked with *, the first author is either one of my students at the time or myself. (b). All the magazine papers listed below are peer-reviewed scholarly papers.)

1. C. Wang, D. Zheng, X. Liu, W. Tang, H. Xu and **X. Cao**, "Towards Cost Optimization in Security-Aware Service Function Chaining and Embedding over Multi-Vendor Edge Networks," Elsevier Computer Networks, Feb. 2025, DOI:10.1016/j.comnet.2024.111002

2. J. Yu, H. Yao, K. Ouyang, **X. Cao** and L. Zhang, "BPS-FL: Blockchain-based Privacy-preserving and Secure Federated Learning," Big Data Mining and Analytics, Vol.8, No.1, pp. 189-213, Feb. 2025, DOI: 10.26599/BDMA.2024.9020053

3. X. Liu, D. Zheng, H. Xing, L. Feng, C. Peng and **X. Cao** "A cost-provable solution for reliable in-network computing-enabled services deployment," Elsevier Computer Networks, Feb. 2025, DOI: 10.1016/j.comnet.2024.110997

4. D. Zheng, H. Xiang, L. Feng and **X. Cao**, "Provably efficient security-aware service function tree composing and embedding in multi-vendor networks," Elsevier Computer Networks, Vol. 254, Dec. 2024, DOI: 10.1016/j.comnet.2024.110843

5. D. Zheng and **X. Cao**, "Provably Efficient Service Function Chain Embedding and Protection in Edge Networks," IEEE/ACM Transactions on Networking, Oct. 2024, DOI: 10.1109/TNET.2024.3475248

6. D. Zheng, H. Fang, S. Cao, Y. Zhong and **X. Cao**, "Towards Resources Optimization in Deploying Service Function Chains with Shared Protection," Elsevier Computer Networks, Vol. 248, Jun. 2024, DOI: 10.1016/j.comnet.2024.110494

7. C. Peng, D. Zheng, Y. Zhong and **X. Cao**, "Off-site Protection against Service Function Forwarder Failures in NFV," Elsevier Computer Networks, Vol. 221, Feb. 2023, DOI: 10.1016/j.comnet.2022.109510

8. D. Zheng, G. Shen, Y. Li, **X. Cao** and B. Mukherjee, "Service Function Chaining and Embedding with Heterogeneous Faults Tolerance in Edge Networks," IEEE Transaction on Network and Service Management, Vol. 20, No. 3, pp. 2157-2171, Sep. 2023, DOI: 10.1109/TNSM.2022.3220667

9. D. Zheng, G. Shen, **X. Cao** and B. Mukherjee, "Towards Optimal Parallelism-Aware Service Chaining and Embedding," IEEE Transaction on Network and Service Management, Vol. 19, No. 3, pp.2063-2077, Sep. 2022, DOI: 10.1109/TNSM.2022.3142184

10. X. Liao, D. Zheng, Y. Wu and **X. Cao**, "Coronavirus Pandemic Analysis through Tripartite Graph Clustering in Online Social Networks," Big Data Mining and Analytics, Vol. 4, No. 4, pp. 242-251, Dec. 2021, DOI: 10.26599/BDMA.2021.9020010

11. C. Peng, D. Zheng, S. Philip and **X. Cao**, "Latency-bounded Off-site Virtual Node Protection in NFV," IEEE Transaction on Network and Service Management, Vol. 18, No. 3, pp. 2545-2556, Sep. 2021, DOI: 10.1109/TNSM.2021.3096477

12. J. Yu*, Z. Qiao, W. Tang, D. Wang, and **X. Cao**, "Blockchain-Based Decision Tree Classification in Distributed Networks," Intelligent Automation & Soft Computing (IASC), Vol.29, No.3, pp.713-728, Jul. 2021, DOI:10.32604/iasc.2021.017154

13. D. Zheng, H. Gu, W. Wei, C. Peng and **X. Cao**, "Network Service Chaining and Embedding with Provable Boundaries," in IEEE Internet of Things Journal, Vol. 8, No. 9, May 2021, pp.7140-7151, DOI: 10.1109/JIOT.2020.3038617

14. D. Zheng, C. Peng, X. Liao, and **X. Cao**, "Toward Optimal Hybrid Service Function Chain Embedding in Multiaccess Edge Computing," in IEEE Internet of Things Journal, Vol. 7, No. 7, pp. 6035-6045, July 2020, DOI: 10.1109/JIOT.2019.2957961

15. C. Kong, G. Luo, L. Tian, and **X. Cao**, "Disseminating Authorized Content Via Data Analysis In Opportunistic Social Networks," Big Data Mining and Analytics, Vol.2, No.1, pp. 12-24, Mar. 2019, DOI: 10.26599/BDMA.2018.9020028 (Yearly Excellent Paper Award, 2020)

16. B. Camp, J. Mandivarapu, J. Mehta, N. Ramamurthy, J. Wingo, A. G. Bourgeois, **X. Cao,** and R. Sunderraman, "A New Cross-Platform Architecture for Epi-Info Software Suite," BMC Bioinformatics, pp. 359:1-8, 2018

17. J. Duan, R. Tian, Y. Xing, Y. Huang, **X. Cao**, Y. Zhang, and G. Zhao, "A Collaborative Pricing Framework for In-Network Caching in Information-Centric Networking", IEEE Access, Vol.6, No.1, pp. 4085-4093, Dec. 2018

18. M. Jalalitabar, E. Guler, G. Luo, L. Tian, and **X. Cao**, "Dependence-Aware Service Function Chain Design and Mapping", IEEE/OSA Journal of Optical Communications and Networking (JOCN), Vol.10, No. 8, Aug. 2018 (invited)

19. F. Hu*, Q. Hao, Q. Sun, **X. Cao**, R. Ma, T. Zhang, Y. Patil, and J. Lu, "Cyber-Physical System with Virtual Reality for Intelligent Motion Recognition and Training", IEEE Transactions on System, Man, and Cybernetics, Vol. 47, No. 2, pp. 347- 363, Feb. 2017

20. Z. Ye*, **X. Cao**, J. Wang, H. Yu, and C. Qiao, "Joint Topology Design and Mapping of Service Function Chains for Efficient, Scalable and Reliable Network Function Virtualization," IEEE Network, Vol. 30, No. 3, pp. 81-87, May 2016

21. Yang Wang, Q. Hu, and **X. Cao**, "A Branch-and-Price Framework for Optimal Virtual Network Embedding," Elsevier Computer Networks, Vol 13, No. 39, Nov. 2015

22. X. Gao*, Z. Ye, J. Fan, W. Zhong, Y. Zhao, **X. Cao**, H. Yu and C. Qiao, "Virtual Network Mapping for Reliable Multicast Services with Max-Min Fairness of Reliability," IEEE/OSA Journal of Optical Communications and Networking (JOCN), Vol. 7, No. 9, pp. 942-951, Sep. 2015

23. S. Shakya, **X. Cao**, Z. Ye and C. Qiao, "Spectrum Allocation in Spectrum-sliced Elastic Optical Path Networks using Traffic Prediction", Springer Photonic Network Communication Journal, Vol. 30, No. 1, pp. 131 – 142, Mar. 2015

24. K. Manandhar, **X. Cao**, F. Hu, and Y. Liu, "Detection of Faults and Attacks Including False Data Injection Attack in Smart Grid Using Kalman Filter," IEEE Transactions on Control of Network Systems, Vol. 1, No. 4, pp. 370 – 379, Dec. 2014

25. Z. Ye*, X. Li, A. Patel, P. Ji, **X. Cao**, and C. Qiao, "Upgrade-aware Virtual Infrastructure Mapping in Software-Defined Elastic Optical Networks," Springer Photonic Network Communication Journal, Vol. 28, No. 1, pp. 34 - 44, Aug. 2014

26. Y. Zhang, L. Sun, H. Song and **X. Cao**, "Ubiquitous WSN for Healthcare: Recent Advances and Future Prospects," IEEE Internet of Things Journal, Vol. 1, No. 4, pp. 311-318, Aug. 2014

27. C. Wang, C. Lan, S. Niu, **X. Cao** and M. Gong, "An ID-Based Certified E-mail Protocol with STTP Suitable for Wireless Mobile Environments," Journal of Computers, Vol. 8, No. 1, pp. 3 - 9, 2013

28. Q. Hu, Yang Wang, and **X. Cao**, "Survivable Network Virtualization for a Single Facility Node Failure: A Network Flow Perspective," Elsevier *Optical Switching and Networking* (OSN), Vol. 10, No. 4, pp. 406-415, 2013

29. Yang Wang, **X. Cao**, A. Caciula and Q. Hu, "Batch Scheduling in Optical Networks," IEEE/OSA Journal of Optical Communications and Networking (JOCN), Vol. 5, No. 2, pp. 116-126, 2013

30. Yang Wang, **X. Cao,** Q. Hu, and Y. Pan, "Towards Elastic and Fine-granular Bandwidth Allocation in Spectrum-sliced Optical Networks," IEEE/OSA Journal of Optical Communications and Networking (JOCN), Vol. 4, No. 11, pp. 906-917, 2012

31. Yang Wang and **X. Cao**, "Multi-granular Optical Switching: A Classified Overview for the Past and Future," IEEE Communications Surveys & Tutorials, Vol. 14, No. 3, pp. 698-713, Jul. 2012

32. T. E. Calhoun, Jr., **X. Cao**, Y. Li, and R. Beyah, "An 802.11 MAC Layer Covert Channel," Wireless Communications and Mobile Computing (WCMC), Vol. 12, No. 5, Apr. 2012

33. Yang Wang and **X. Cao**, "A Study on the Dynamic Waveband Switching in WDM networks," IEEE/OSA Journal of Optical Communications and Networking (JOCN), Vol. 3, No. 5, pp. 390-398, 2011

34. Yang Wang and **X. Cao**, "Multi-granular Waveband Assignment and Protection in WDM Networks," IEEE/OSA Journal of Lightwave Technology (JLT), Vol. 28, No.13, pp. 2004-2013, Jul. 2010

35. L. Pan*, **X. Cao**, and H. Wu, "Design and Modeling a Distributed and Fair Access MAC Protocol (DFA) for Multi-hop Wireless Networks," IEEE Transactions on Wireless Communications, VOL. 8, NO. 5, pp.2434-2442, May 2009

36. **X. Cao**, J. Joseph, J. Li, and C. Xin, "Serialized Batch Scheduling Algorithm for Optical Burst Switching Networks," IET Journal of Communications, VOL.3, NO. 3, pp.353-362, Mar. 2009

37. V. Anand*, **X. Cao**, S. Sheeshia, C. Xin and C. Qiao, "Fiber-Optical Communication Networks," Wiley Encyclopedia of Computer Science and Engineering, http://doi.wiley.com/10.1002/9780470050118.ecse284, Sep. 2008

38. **X. Cao**, V. Anand, and C. Qiao, "Waveband Switching for Dynamic Traffic Demands in Multi-granular Optical Networks," IEEE/ACM Transactions on Networking, VOL. 15, NO. 5, pp. 957-968, 2007

39. **X. Cao**, V. Anand and C. Qiao, "A Framework for Waveband Switching in Multi-Granular Optical Networks - Part II," OSA Journal of Optical Networking, Vol. 6, No. 1, pp. 48-62, 2007

40. **X. Cao**, V. Anand, and C. Qiao, "A Framework for Waveband Switching in Multi-Granular Optical Networks - Part I," OSA Journal of Optical Networking, Vol. 5, No. 12, pp. 1043-1055, Dec. 2006

41. C. Xin*, B. Wang, **X. Cao** and J. Li, "Logical Topology Design for Dynamic Traffic Grooming in Mesh WDM Optical Networks," IEEE/OSA Journal of Lightwave Technology (JLT), Vol. 24, No.6, pp. 2267- 2275, Jun. 2006

42. F. Hu*, W. Siddiqui and **X. Cao**, "SPECTRA: Secure Power-Efficient Clustered-Topology Routing Algorithm in Large-scale Wireless micro-Sensor Networks," International Journal of Information Technology, Vol. 11, No.2, pp. 95-118, 2005

43. **X. Cao**, V. Anand, J. Li, and C. Xin, "Waveband Switching Networks with Limited Wavelength Conversion," IEEE Communications Letters, Vol. 9, No.7, pp.646-648, Jul. 2005

44. X. Yu*, J. Li, **X. Cao**, Y, Chen and C. Qiao "Traffic Statistics and Performance Evaluation in Optical Burst Switched Networks," IEEE/OSA Journal of Lightwave Technology (JLT), Vol. 22, No.12, pp. 2722- 2738, Dec. 2004

45. **X. Cao**, V. Anand, Y. Xiong, and C. Qiao, "A Study of Waveband Switching with Multi-layer, Multi-granular Optical Cross-connects," IEEE Journal on Selected Areas in Communications (JSAC), Vol. 21, No. 7, pp.1081-1095, Sep. 2003

46. **X. Cao**, V. Anand, and C. Qiao, "A Waveband Switching Architecture and Algorithm for Dynamic Traffic," IEEE Communications Letters, Vol. 7, No. 8, pp. 397-399, Aug. 2003

47. **X. Cao**, V. Anand, and C. Qiao, "Waveband Switching in Optical Networks," IEEE Communications Magazine, Vol. 41, No. 4, pp. 105-112, Apr. 2003

C. Book

48. F. Hu* and **X. Cao**, "Wireless Sensor Networks: Principles and Practice (Hardcover)," Auerbach Publications; 1st edition, 531pages ISBN-10: 1420092154, ISBN-13: 978-1420092158, May 2010

D. Book Chapters

49. Y. Wang, V. Anand, and **X. Cao**, "Waveband Switching: A Scalable and Cost Efficient Solution for the Internet Backbone," in "Solutions for Sustaining Scalability in Internet Growth," IGI Global, 2014, pp. 195-217, doi:10.4018/978-1-4666-4305-5

50. F. Hu*, Y. Wang, **X. Cao**, Q. Hao, and D. Brown, "Using Wiimote and Kinect for Cognitive Rehabilitation: Toward an intelligent Sensor/Image Signal Processing," in Book "Cyber-Physical Systems: Integrated Computing and Engineering Design", Chapter 21, CRC Press, Boca Raton, FL, 2013

51. F. Hu*, **X. Cao**, D. Brown, J. Park, M. Sun and Y. Wu, "Tele-Rehabilitation Computing: From An Cyber-Physical Perspective," in Book "Tele-Healthcare Computing and Engineering: Principles and Design," Chapter 4, CRC Press, Boca Raton, FL, 2013

52. K. Manandhar, **X. Cao** and F. Hu, "A Framework for Detecting Attacks on Sensors of Water System," in "Intelligent Sensor Networks: Across Sensing, Signal Processing, and Machine Learning," F. Hu and Q. Hao Eds, CRC Press, 2012, ISBN: 978-1-4398-9281-7

53. F. Hu*, **X. Cao**, K. Wilhelm, M. Łukowiak and S. Radziszowski, "NTRU-Based Confidential Data Transmission in Telemedicine Sensor Networks," in "Security in Ad-hoc and Sensor Networks," R. Beyah, J. McNair, and C. Corbett Eds, World Scientific Publishing Co., 2009, ISBN: 978-981-4271-08-0

54. **X. Cao**, V. Anand, Y. Xiong, and C. Qiao, "Waveband Switching: A New Frontier in Optical WDM Networks," in "Optical WDM Networks II: Past Lessons and Path Ahead," K. Sivalingam and S. Subramaniam Eds, Kluwer Academic Publishers, 2004/2005

E. *Refereed Conference Papers*

55. C. Peng, Y. Bai, S. Yang, D. Zheng and **X. Cao**, "Chain Segment Protection for Dependence-aware Service Function Chain in NFV" in Proc. of 7th World Conference on Computing and Communication Technologies (WCCCT), Apr. 2024, DOI: 10.1109/WCCCT60665.2024.10541465

56. Y. Zhong, D. Zheng, and **X. Cao**, "A DRL Approach with Network Service Deployment Transformer for Reliable SFC Deployment," in Proc. of IEEE International Conference on Communications (ICC), Denver, Jun. 2024, DOI: 10.1109/ICC51166.2024.10622220

57. D. Zheng, S. Cao, H. Xu, and **X. Cao**, "Deploying Security-Aware Service Function Chains with Asymmetric Dedicated Protection," in Proc. of IEEE International Conference on Communications (ICC), Denver, Jun. 2024, DOI: 10.1109/ICC51166.2024.10622657

58. D. Zheng, X. Liu, W. Tang, W. Tang, and **X. Cao**, "Cost Optimization in Security-Aware Service Function Chain Deployment with Diverse Vendors," in IEEE Global Communications Conference (GLOBECOM), Dec. 2023

59. X. Liu, D. Zheng, and **X. Cao**, "Energy-Efficient In-Network Computing at Mobile Edge Networks," to appear in IEEE 9th International Conference on Computer and Communications (ICCC), Dec. 2023

60. C. Peng, D. Zheng, B. Wang, and **X. Cao**, "Off-site Service Function Protection for Type-oriented Forwarder Failures," in Proc. of IEEE International Conference on Communications (ICC), Rome, Italy, May 2023

61. D. Zheng, G. Shen, B. Chen, C. Peng, **X. Cao,** and B. Mukherjee, "Embedding Service Function Chains with Dedicated Protection in Edge Networks," in Proc. of IEEE International Conference on Communications (ICC), Rome, Italy, May 2023

62. B. Wang, **X. Cao**, C. Peng, J. Li, and D. Zheng, "Towards Service Function Chaining and Embedding for Multi-Security Guarantee Levels," in Proc. of 8th International Conference on Computer and Communications (ICCC), Dec. 2022

63. D. Zheng, C. Peng, B. Wang, and **X. Cao**, "Towards Deterministic Fault-Tolerant Service Function Slicing in Edge Networks," in Proc. of International Conference on Computer Communications and Networks (ICCCN), Jul. 2022 (**Invited**)

64. C. Peng, D. Zheng, and **X. Cao**, "Latency-aware VNF Protection for Network Function Virtualization in Elastic Optical Networks," in IEEE Global Communications Conference (GLOBECOM), Dec. 2021

65. D. Zheng, C. Peng, and **X. Cao**, "On the Placement of Edge Server for Mobile Edge Computing," in Proc. of 7th International Conference on Computer and Communications (ICCC), Dec. 2021

66. C. Peng, D. Zheng, and **X. Cao**, "Minimum Cost Hybrid Node Protection in NFV," in Proc. of 7th International Conference on Computer and Communications (ICCC), Dec. 2021

67. D. Zheng, C. Peng, X. Liao, and **X. Cao**, "Parallelism-aware Service Function Chaining and Embedding for 5G Networks," in Proc. of International Conference on Computer Communications and Networks (ICCCN), Jul. 2021

68. X. Liao, D. Zheng, Y. Wu, and **X. Cao**, "Should We Trust Influencers on Social Networks? On Instagram Sponsored Post Analysis," in Proc. of International Conference on Computer Communications and Networks (ICCCN), Jul. 2021

69. D. Zheng, C. Peng, X. Liao, L. Tian, G. Luo, and **X. Cao**, "Towards Latency Optimization in Hybrid Service Function Chain Composition and Embedding," in IEEE International Conference on Computer Communications (INFOCOM), 2020

70. M. Jalalitabar, Y. Wang and **X. Cao**, "Branch-Awareness in Service Function Graph Design and Embedding," 2019 IEEE 40th Sarnoff Symposium, Newark, NJ, USA, 2019, pp. 1-3, doi: 10.1109/Sarnoff47838.2019.9067825

71. M. Jalalitabar, Y. Wang and **X. Cao**, "Branching-Aware Service Function Placement and Routing in Network Function Virtualization," 2019 IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN), Dallas, TX, USA, 2019, pp. 1-6, doi: 10.1109/NFV-SDN47374.2019.9039981

72. S. Philip, C. Peng, and **X. Cao**, "Role Based Medium Access Control in Wireless Sensor Networks," in IEEE International Conference on Computer and Communications (ICCC), 2019

73. D. Zheng, C. Peng, X. Liao, G. Luo, L. Tian, and **X. Cao**, "Service Function Chaining and Embedding with Spanning Closed Walk," in IEEE HPSR, Xi'An, May 2019

74. E. Guler, S. Devaraju, G. Luo, L. Tian, and **X. Cao**, "Multicast-Aware Service Function Tree Embedding," in IEEE HPSR, Xi'An, May 2019

75. D. Zheng, C. Peng, E. Guler, G. Luo, L. Tian, and **X. Cao**, "Hybrid Service Chain Deployment in Networks with Unique Function," in IEEE International Conference on Communications (ICC), Shanghai, May 2019

76. X. Liao, Y. Wu, and **X. Cao**, "Second-order CoSimRank for Similarity Measures in Social Networks," in IEEE International Conference on Communications (ICC), Shanghai, May 2019

77. D. Zheng, E. Guler, C. Peng, G. Luo, L. Tian, and **X. Cao**, "Dependence-Aware Service Function Chain Embedding in Optical Networks," in IEEE International Conference on Communications (ICC), Shanghai, May 2019

78. E. Guler, D. Zheng, G. Luo, L. Tian, and **X. Cao**, "Embedding Multicast Services in Optical Networks with Fanout Limitation," in IEEE International Conference on Communications (ICC), Kansas City, May 2018

79. M. Jalalitabar, E. Guler, G. Luo, L. Tian and **X. Cao**, "Dependence-Aware Service Function Chain Design and Mapping," in IEEE Global Communications Conference (GLOBECOM), Singapore, Dec. 2017

80. E. Guler, D. Zheng, G. Luo, L. Tian and **X. Cao**, "Virtual Multicast Tree Embedding Over Elastic Optical Networks," in IEEE Global Communications Conference (GLOBECOM), Singapore, Dec. 2017

81. B. Camp, J. Mandivarapu, J. Mehta, N. Ramamurthy, J. Wingo, A. G. Bourgeois, **X. Cao** and R. Sunderraman, "A Cross-Platform System Architecture for Form Design and Data Analytics for Public Health," in Proc. of ACM BCB, Aug. 2017

82. E. Guler, D. Zheng, G. Luo, L. Tian and **X. Cao**, "Embedding virtual multicast trees in software-defined networks," in Proc. of IEEE International Conference on Communications (ICC), Paris, France, May 2017

83. C. Kong, G. Luo, L. Tian and **X. Cao**, "Optimizing Social Connections for Efficient Information Acquirement," in Proc. of IEEE Global Communications Conference (GLOBECOM), Washington, D.C. Dec. 2016

84. E. Guler, G. Luo, K. Koneru and **X. Cao**, "Closeness-Centrality Based Multicast-Aware Virtual Network Embedding," in Proc. of IEEE Global Communications Conference (GLOBECOM), Washington, D.C. Dec. 2016

85. M. Jalalitabar, G. Luo, C. Kong and **X. Cao**, "Service Function Graph Design and Mapping for NFV with Priority Dependence," in Proc. of IEEE Global Communications Conference (GLOBECOM), Washington, D.C. Dec. 2016

86. Z. Ye, **X. Cao**, C. Qiao, "Joint Topology Design and Mapping of Service Function Chains in Network Function Virtualization," in Proc. of IEEE Global Communications Conference (GLOBECOM), Washington, D.C. Dec. 2016

87. S. Shakya and **X. Cao**, "Transparent Virtual Network Embedding in Elastic Optical Networks," in Proc. of IEEE Sarnoff Symposium, Princeton, NJ May 2016

88. X. Gao*, W. Zhong, Z. Ye, Y. Zhao, J. Fan, **X. Cao**, H. Yu and C. Qiao, "Virtual Network Mapping for Reliable Multicast Services with Max-Min Fairness," in Proc. of IEEE Global Communications Conference (GLOBECOM), Dec. 2015

89. K. Manandhar and **X. Cao**, "Optimizing Load Schedule for Building Energy Management in Smart Grids," in Proc. of International Conference on Computer Communications and Networks (ICCCN), Aug. 2015

90. C. Kong and **X. Cao**, "Disseminating Authorized Content in Interest-centric Opportunistic Social Networks," in Proc. of International Conference on Computer Communications and Networks (ICCCN), Aug. 2015

91. X. Gao*, Z. Ye, W. Zhong, C. Qiao, **X. Cao**, H. Zhao, H. Yu and V. Anand, "Multicast Service-oriented Virtual Network Mapping Over Elastic Optical Networks," in Proc. of IEEE International Conference on Communications (ICC), London, UK, Jun. 2015

92. N. Kadu, S. Shakya and **X. Cao**, "Modulation-aware Multipath Routing and Spectrum Allocation in Elastic Optical Networks," in Proc. of IEEE International Conference on Advanced Networks and Telecommunication Systems (ANTS), Dec. 2014 (**Invited**)

93. S. Shakya, N. Pradhan, **X. Cao**, Z. Ye and C. Qiao, "Virtual Network Embedding and Reconfiguration in Elastic Optical Networks," in Proc. of IEEE Global Communications Conference (GLOBECOM), Dec. 2014

94. K. Manandhar and **X. Cao**, "Attacks/Faults Detection and Isolation in the Smart Grid using Kalman Filter," in Proc. of International Conference on Computer Communications and Networks (ICCCN), Aug. 2014

95. Q. Hu, Yang Wang and **X. Cao**, "Virtual Network Embedding: An Optimal Decomposition Approach," in Proc. of International Conference on Computer Communications and Networks (ICCCN), Aug. 2014

96. C. Kong and **X. Cao**, "Semi-Controlled Authorized Information Dissemination in Content-Based Social Networks," in Proc. of International Conference on Computer Communications and Networks (ICCCN), Aug. 2014

97. K. Manandhar, B. Adcock and **X. Cao**, "Preserving the Anonymity in MobilityFirst Networks," in Proc. of International Conference on Computer Communications and Networks (ICCCN), Aug. 2014

98. S. Shakya, **X. Cao**, Z. Ye and C. Qiao, "Spectrum Allocation for Time-varying Traffic in Elastic Optical Networks using Traffic Pattern," in Proc. of Optical Fiber Communication Conference and Exposition (OFC), San Francisco, CA 2014

99. Yang Wang, Q. Hu and **X. Cao**, "Connectivity as a Service: Towards Optical-based Network Virtualization," in Proc. of International Conference on Computing, Networking and Communications (ICNC), Honolulu, Hawaii, Feb. 2014 (**Invited**)

100. L. Tian, Y. Zhou and **X. Cao**, "A New Rate-Complexity-QP Algorithm (RCQA) for HEVC Intra-Picture Rate Control," in Proc. of International Conference on Computing, Networking and Communications (ICNC), Honolulu, Hawaii, Feb. 2014

101. K. Manandhar, **X. Cao**, F. Hu and Y. Liu, "Combating False Data Injection Attacks in Smart Grid Using Kalman Filter," in Proc. of International Conference on Computing, Networking and Communications (ICNC), Honolulu, Hawaii, Feb. 2014

102. S. Shakya, Yang Wang, **X. Cao**, Z. Ye and C. Qiao, "Minimize Sub-carrier Reallocation in Elastic Optical Path Networks using Traffic Prediction," in Proc. of IEEE Global Communications Conference (GLOBECOM), Atlanta, GA, Dec. 2013

103. C. Kong, **X. Cao** and M. Liu, "Bayesian-based Video Sharing in Mobile Social Networks," in Proc. of IEEE Global Communications Conference (GLOBECOM), Atlanta, GA, Dec. 2013

104. Q. Hu, Yang Wang and **X. Cao**, "Towards Survivable Network Virtualization," in Proc. of IEEE International Conference on Communications (ICC), Budapest, Hungary 2013

105. Z. Ye, **X. Cao**, X. Gao and C. Qiao, "A Predictive and Incremental Grooming Scheme for Time-varying Traffic in WDM Networks," in Proc. of IEEE International Conference on Computer Communications (INFOCOM) Mini-conference, Turin, Italy 2013

106. Q. Hu, Yang Wang and **X. Cao**, "Resolve the Virtual Network Embedding Problem: a Column Generation Approach," in Proc. of IEEE International Conference on Computer Communications (INFOCOM) Mini-conference, Turin, Italy 2013

107. S. Shakya and **X. Cao**, "Spectral Defragmentation in Elastic Optical Path Networks using Independent Sets," in Proc. of Optical Fiber Communication Conference and Exposition (OFC/NFOEC), Anaheim, CA 2013 (**Invited**)

108. Yang Wang, **X. Cao** and C. Qiao, "Minimize Sub-carrier Re-allocation Overhead in SLICE Networks with Dynamic Traffic," in Proc. of Optical Fiber Communication Conference and Exposition (OFC/NFOEC), Anaheim, CA 2013

109. Yang Wang, **X. Cao**, A. Caciula and Q. Hu, "Batch Scheduling in Optical Networks with Feedback/Feed-forward Fiber Delay Lines," in Proc. of IEEE Global Communications Conference (GLOBECOM), Anaheim, CA 2012

110. A. Rea*, **X. Cao**; A. Gupta and N. Shenoy, "A Secure Cloud Internetwork Model with Economic and Social Incentives (SCIMES)," in 18th Americas Conference on Information Systems (AMCIS), Washington Jul. 2012

111. K. Manandhar, **X. Cao**, and F. Hu, "Attack Detection in Water Supply Systems using Kalman Filter Estimator," in Proc. of IEEE Sarnoff Symposium, Princeton, NJ May 2012

112. Q. Hu, Yang Wang and **X. Cao**, "Location-constrained Survivable Network Virtualization," in Proc. of IEEE Sarnoff Symposium, Princeton, NJ May 2012

113. Yang Wang and **X. Cao**, "Wavelength Retuning in Optical Waveband Switching Networks," in Proc. of IEEE International Conference on Computer Communications and Networks (ICCCN), Maui, Hawaii, Jul. 2011

114. Yang Wang, **X. Cao** and Q. Hu, "Routing and Spectrum Allocation in Spectrum-sliced Elastic Optical Path Networks," in Proc. of IEEE International Conference on Communications (ICC), Kyoto, Japan, Jun. 2011

115. Y. Wang, **X. Cao** and Y. Pan, "A Study on the Routing and Spectrum Allocation in spectrum-sliced Elastic Optical Path Networks," in Proc. of 30th IEEE International Conference on Computer Communications (INFOCOM), Shanghai, Apr. 2011, pp. 1503-1511

116. Yang Wang and **X. Cao**, "Distributive Waveband Assignment in Multi-granular Optical Networks," in Proc. of 24th IEEE International Parallel & Distributed Processing Symposium (IPDPS), Atlanta, GA, Apr. 2010

117. Yang Wang and **X. Cao**, "Adaptive Waveband Switching in WDM Networks," in Proc. of Optical Fiber Communication Conference and Exposition (OFC/NFOEC) 2010

118. C. Xin*, G. Hsieh, and **X. Cao**, "Routing and Wavelength Assignment for an Agile Optical Network," in Proc. of International Conference on Electronics and Information Engineering (ICEIE), pp. 432-436, 2010

119. Yang Wang and **X. Cao**, "Non-uniform Waveband Switching in Multi-granular Optical Networks," in Proc. of IEEE Global Communications Conference (GLOBECOM), Honolulu, Hawaii, Dec. 2009

120. **X. Cao**, Y. Wang and A. Zelikovsky, "Scheduling Bursts using Interval Graphs in Optical Burst Switching Networks," in Proc. of IEEE Global Communications Conference (GLOBECOM), Honolulu, Hawaii, Dec. 2009

121. C. Xin* and **X. Cao**, "A Cognitive Radio Network Architecture Without Control Channel," in Proc. of IEEE Global Communications Conference (GLOBECOM), Honolulu, Hawaii, Dec. 2009

122. **X. Cao**, Yang Wang, Y. Wang and A. Caciula, "Developing a Multifunctional Network Laboratory for Teaching and Research," in Proc. of ACM SIGITE, Fairfax, VA, Oct. 2009

123. **X. Cao**, B. Chakrabarty, Yang Wang and F. Hu, "An Energy-efficient Disjoint Path Routing Approach for Wireless Ad-hoc Networks," in Proc. of ISCA 22nd Parallel and Distributed Computing and Communication Systems (PDCCS), Louisville, Kentucky, Sep. 2009

124. **X. Cao**, Y. Wang, Yang Wang and C. Xin, "Tree-based Burst Aggregation in Optical Burst Switching Networks," in Proc. of ISCA 22nd Parallel and Distributed Computing and Communication Systems (PDCCS), Louisville, Kentucky, Sep. 2009

125. Yang Wang and **X. Cao**, "A New Hierarchical Waveband Assignment Algorithm for Multi-granular Optical Networks," in Proc. of IEEE International Conference on Computer Communications and Networks (ICCCN), San Francisco, CA, Aug. 2009

126. C. Wang, X. Yang, C. Lan, and **X. Cao**, "An Efficient Identity-based Certified E-mail Protocol," in Proc. of Fifth International Conference on Intelligent Information Hiding and Multimedia Signal Processing (IIHMSP), Kyoto, Japan, 2009

127. Yang Wang and **X. Cao**, "Band-segment Protection in Multi-granular Optical Networks," in Proc. of IEEE Sarnoff 2009, pp. 1-5

128. C. Xin* and **X. Cao**, "An Agile Lightpath Provisioning Paradigm for IP Over WDM Optical Networks," in Proc. of Optical Fiber Communication Conference and Exposition (OFC/NFOEC) 2008

129. **X. Cao** and C. Xin, "Placement of Multi-Granular Optical Cross-Connects in WDM Networks," in Proc. of Optical Fiber Communication Conference and Exposition (OFC/NFOEC) 2008

130. E. Golen, N. Shenoy, and **X. Cao**, "A Low Latency Scheme for Bulk RFID Tag Reading," in Proc. of IEEE Wireless Communications & Networking Conference (WCNC), Las Vegas, Mar. 2008, pp. 1565-1569

131. **X. Cao**, "Optimizing and Modeling Topology Design in High-speed Optical Wireless Communication Networks," in Proc. of IEEE International Conference on Circuits & Systems for Communications (ICCSC), May 2008, pp. 683-687

132. N. Shenoy*, **X. Cao**, S. Hild, and P. Chou, "A Turn Taking Medium Access Protocol for Wireless Ad Hoc Networks," in Proc. of Military Communications Conference (MILCOM), Orlando, FL, Oct. 2007, pp. 1-7

133. **X. Cao**, J. Joseph, J. Li, C. Xin, "Group Schedule Serialized Traffic in Optical Burst Switching Networks," in Proc. of IEEE International Conference on Broadband Communications, Networks, and Systems (BROADNETS), Raleigh, NC, Sep. 2007

134. N. Shenoy*, **X. Cao**, Y. Nozaki, S. Hild, and P. Chou, "Neighbor Turn Taking MAC – A Loosely Scheduled Access Protocol for Wireless Networks," in Proc. of IEEE 18th International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC) 2007, pp. 1-5

135. **X. Cao**, S. Liu, L. Pan, and H. Wu, "Enhanced Synchronized Medium Access Control Protocol for Wireless Ad Hoc Networks," in Proc. of IEEE International Conference on Computer Communications and Networks (ICCCN), Honolulu, HI, Aug. 2007, pp. 278-283

136. F. Hu*, C. May, and **X. Cao**, "Data Aggregation in Distributed Sensor Networks: Towards An Adaptive Timing Control," in Proc. of ITNG 2006, pp. 256-261

137. F. Hu*, **X. Cao** and S. Kumar, "Trustworthiness in Wireless Sensor and Actuator Networks: Towards Low-complexity Reliability and Security," in Proc. of IEEE Global Communications Conference (GLOBECOM), St. Louis, Dec. 2005, pp. 1696-1700

138. C. Xin, J. Li, **X. Cao** and B. Wang, "Computing Loss Probability for Dynamic Traffic Grooming in Optical Networks with Wavelength Conversion," in Proc. of IEEE Global Communications Conference (GLOBECOM), St. Louis, Dec. 2005, pp. 291-295

139. C. Xin*, B. Wang, **X. Cao** and J. Li, "A heuristic logical topology design algorithm for multi-hop dynamic traffic grooming in WDM optical networks," in Proc. of IEEE Global Communications Conference (GLOBECOM), St. Louis, Dec. 2005, pp. 2102-2106

140. C. Xin*, **X. Cao**, J. Li and B. Wang, "A Route Segment Technique for Blocking Analysis of Dynamic Traffic Grooming," in Proc. of 2nd IEEE/Create-Net International Workshop on Traffic Grooming, Co-located with IEEE/Create-Net BroadNets, Boston, Oct. 2005

141. C. Xin*, B. Wang, **X. Cao** and J. Li, "Formulation of Multi-Hop Dynamic Traffic Grooming in WDM Optical Networks," in Proc. of 2nd IEEE/Create-Net International Conference on Broadband Networks (BROADNETS), Boston, Oct. 2005, pp. 1203-1208

142. V. Anand* and **X. Cao**, "Waveband Switching: A Scalable and Cost Efficient Technique for Optical Network Design," in Proc. of International Conference on Internet Computing (ICOMP), 2005, PP. 225-230

143. F. Hu* and **X. Cao**, "Security in Wireless Actor & Sensor Networks (WASN): Towards A Hierarchical Re-Keying Design," in Proc. of International Conference on Information Technology Coding and Computing (ITCC), Las Vegas, NV, Apr. 2005. pp. 528-533

144. F. Hu*, **X. Cao**, and C. May, "Optimized Scheduling for Data Aggregation in Wireless Sensor Networks," in Proc. of International Conference on Information Technology Coding and Computing (ITCC), Las Vegas, NV, Apr. 2005. pp. 557-561

145. J. Li*, **X. Cao** and C. Xin, "Dual Reservation in Optical Burst Switching Networks," in Proc. of IEEE Sarnoff Symposium, Princeton, Apr. 2005, pp. 180-183

146. **X. Cao**, C. Qiao, V. Anand and J. Li, "Wavelength Assignment in Waveband Switching Networks with Wavelength Conversion," in Proc. of IEEE Global Communications Conference (GLOBECOM), Dallas, TX, Dec. 2004, pp.1943-1947

147. **X. Cao**, V. Anand and C. Qiao, "Multi-Layer versus Single-Layer Optical Cross-connect Architectures for Waveband Switching," in Proc. of 23rd IEEE International Conference on Computer Communications (INFOCOM), Hong Kong, Apr. 2004, pp. 1830-1840

148. **X. Cao**, V. Anand, Y. Xiong and C. Qiao, "Performance Evaluation of Wavelength Band Switching in Multi-fiber All-Optical Networks," in Proc. of 22nd IEEE International Conference on Computer Communications (INFOCOM), San Francisco, CA, Apr. 2003, pp. 2251 -2261

149. **X. Cao**, Y. Xiong, V. Anand and C. Qiao, "Wavelength Band Switching in Multi-granular All-Optical Networks," in Proc. of SPIE Optical Networking & Conference (OPTICOMM), Vol. 4874, Boston, MA, Aug. 2002. pp. 198-210

150. **X. Cao**, J. Li, Y. Chen and C. Qiao, "Assembling TCP/IP Packets in Optical Burst Switched Networks," in Proc. of IEEE Global Communications Conference (GLOBECOM), Taiwan, Nov. 2002. pp. 2808 -2812

F. *Workshop/Poster Papers*

151. C. Kong and **X. Cao**, "Disseminating Content in Interest-centric Opportunistic Social Networks," poster in MobiHoc, Hangzhou, China 2015

152. Y. Wang, **X. Cao**, A. Caciula and Q. Hu, "On-line Batch Scheduling in Distributed Optical Networks", in Proc. of 14th Workshop on Advances on Parallel and Distributed Processing Symposium (APDCM 2012), joint with IEEE IPDPS, May 2012

153. **X. Cao**, "An Integer Linear Programming Approach to Topology Design in Optical Wireless Communication Networks," in Proc. of EHF-AEROCOMM 2008, joint with IEEE GLOBECOM'08

154. Erik F. Golen, Nirmala Shenoy, and **X. Cao** "A Low Latency Protocol for Bulk RFID Tag Reading," in Proc. of IEEE Upstate NY Workshop on Communications, Sensors, and Networking '07, Nov. 2007

155. N. Shenoy*, J. Schull and **X. Cao** "A Design for a Secure Sensor Communications Network," in Proc. of Workshop on Research & Development Partnerships in Homeland Security, Boston, MA, Apr. 26, 2005

156. F. Hu*, S. Kumar, and **X. Cao** "Trustworthiness in Wireless Sensor and Actuator Networks: Towards Low-complexity Reliability and Security," in Proc. of Fourth IEEE Upstate New York Workshop on Sensor Networks, 2005

157. J. Schull*, N. Shenoy, **X. Cao**, and D. Johnson, "KarmaNets – A Robust Wireless Mesh Sensor and Communications Network," in Proc. of 1st IEEE Upstate NY Communications and Networking Workshop, 2004. pp. 34 – 38

158. **X. Cao** and V. Anand, "Routing and Wavelength Assignment in Waveband Switching Networks," in Proc. of 1st IEEE Upstate NY Communications and Networking Workshop, 2004. pp. 137 -141

159. J. Li*, **X. Cao**, and V. Anand, "Burst Scheduling in Optical Burst Switching Networks," 1st IEEE Upstate NY Communications and Networking Workshop, 2004. pp. 29 – 33

160. **X. Cao**, H. Suen, and L. Troell, "Topology Management in Optical Wireless Communication Networks," in Proc. of RIT GCCIS conference, Dec. 2004

G. Patent

161. **X. Cao**, C. Qiao, V. Anand and Y. Xiong, "Efficient Optical Network Design using Multi-granular Optical Cross-connects with Wavelength Band Switching," US. Patents # 7162632, licensed to Gilead Science Institute

H. Invited Talks and Professional Presentations

1. "Off-site Service Function Protection for Type-oriented Forwarder Failures," IEEE International Conference on Communications (ICC), Rome, Italy, May 2023

2. "Embedding Service Function Chains with Dedicated Protection in Edge Networks," IEEE International Conference on Communications (ICC), Rome, Italy, May 2023

3. "Towards Deterministic Fault-Tolerant Service Function Slicing in Edge Networks", IEEE International Conference on Computer Communications and Networks (ICCCN), Jul. 2022 (**Invited**)

4. "Applications and Challenges in Network Virtualization", IEEE Distinguished Lecture, IEEE Peru Chapter, Sep. 2021 (**Invited**)

5. "Applications and Challenges in Network Virtualization", IEEE Distinguished Lecture, IEEE Comsoc Baltimore Chapter, Nov. 2020 (**Invited**)

6. "Service Function Chaining and Embedding", Asia Communications and Photonics Conference (ACP 2020), Oct. 24-27, 2020, Beijing, China (**Invited**)

7. "Applications and Challenges in Network Virtualization", IEEE Distinguished Lecture, IEEE Comsoc North Macedonia Chapter, Oct. 2020 (**Invited**)

8. "Introduction to Network Virtualization", Xidian University, School of Telecommunications Engineering, Jun. 2020 (**Invited**)

9. "Network Function Virtualization", School of Telecommunications Engineering, Xidian University, May 2019 (**Invited**)

10. "Techniques in Future Optical/Electrical Transport Networks", School of Communication & Information Engineering, University of Electronic Science and Technology of China, Jun. 2015 (**Invited**)
11. "Introduction to Big Data for Network Computing and Applications," School of Computer Science and Engineering, University of Electronic Science and Technology of China, June 2015 (**Invited**)
12. "Modulation-aware Multipath Routing and Spectrum Allocation in Elastic Optical Networks," IEEE International Conference on Advanced Networks and Telecommunication Systems (ANTS), Dec. 2014 (**Invited**)
13. "Connectivity as a Service: Towards Optical-based Network Virtualization", IEEE International Conference on Computing, Networking and Communications (ICNC), Feb. 2014 (**Invited**)
14. "Spectral Defragmentation in Elastic Optical Path Networks using Independent Sets," in Proc. of Optical Fiber Communication Conference and Exposition (OFC/NFOEC), Anaheim, CA 2013 (**Invited**)
15. "The Agile Optical Network," ACM Georgia State University Student Chapter meeting, Atlanta, GA, USA, Aug. 30, 2007 (**Invited**)
16. "Multi-granular Waveband Switching in Optical Networks," School of Computing and Information Sciences, Florida International University, Mar. 2007 (**Invited**)
17. "Multi-granular Waveband Switching in Optical Networks," Department of Computer Science, University of Massachusetts Boston, Mar. 2007 (**Invited**)
18. "Multi-granular Waveband Switching in Optical Networks," IEEE Joint Chapter for Communications and Aerospace technical meeting, Rochester, NY, USA, Feb. 7, 2007 (**Invited**)
19. "Integrated Optical and Wireless Technologies for Broadband Access and Metro Networks Optical Networks" (along with S. Dixit of Nokia Research Center, and T. Wang of NEC Laboratories America, and C. Qiao of SUNY at Buffalo), IEEE WoWMoM, Niagara Fall, NY, Jun. 2006 (**Invited**)
20. "Getting Started – Research & Proposal Preparation," RIT Career Proposal Workshop, Rochester, NY, USA, Nov. 2006 (**Invited**)
21. "Ph.D. Study and Research," 18th Annual UB CSE Graduate Research Conference, Amherst, NY, USA, Feb. 2005 (**Invited**)
22. "Waveband Switching in Optical WDM Networks, University of Louisiana at Lafayette, Lafayette, LA, USA," Dec. 3, 2004 (**Invited**)

IV. Teaching Experiences

- 08/2007 – Present, Teaching graduate and undergraduate courses, Department of Computer Science, Georgia State University, Atlanta, GA
- 12/2005 – 08/2007, Teaching graduate and undergraduate courses, Department of Networking, Security, and Systems Administration (NSSA, a new department created/separated from the IT department), College of Computing and Information Sciences, Rochester Institute of Technology, Rochester, NY
- 07/2004 - 12/2005, Teaching graduate and undergraduate courses, IT Department, College of Computing and Information Sciences, Rochester Institute of Technology, Rochester, NY

- 09/1999 – 05/2001, Teaching Assistant for graduate and undergraduate courses, Department of Computer Science & Engineering, The State University of New York at Buffalo, Buffalo, NY

V. Instructional Activities

- 2022, Faculty sponsor for "Ethical Security and Malware Analysis Guild Club"
- 2011, developed *new* course: "CSC 8250 Advanced Network Architectures and Protocols"
- 2008, designed and implemented the teaching lab (with Mr. Shaochieh Ou)
- 2008, drafted the proposal for the teaching lab, with Dr. Beyah, Dr. Harrison, and Dr. Pan
- 2008, proposed a *new* course: "CSC 8250 Advanced Network Architectures and Protocols," developed brand new materials for the course CSC 8220 (which is not offered by the department for years); made significant revisions to the course CSC 4220/6220
- 2/2005- 07/2007 developed *new* course "Wireless Ad-Hoc/Sensor Networks," Revised course "Data Communications and Computer Networks"; Revised course "OS Scripting"

A. Courses Taught

Year	Semester	Course	Size	Course Name
2023	Fall	CSC8221	31	Optical/Wireless Networks
		CSC8930	3	M.S. Project
2023	Summer	CSC8222	15	Advanced Network Security
2023	Spring	CSC8220	34	Advanced Computer Networks
		CSC8930	3	M.S. Project
2022	Fall	CSC 4222/6222	94	Fundamentals of Cybersecurity
		CSC8930	4	M.S. Project
2022	Summer	CSC 1302	35	Principles of Computer Programming II
2022	Spring	CSC 4222/6222	54	Fundamentals of Cybersecurity
		CSC8220	30	Advanced Computer Networks
		CSC8930	4	M.S. Project
2021	Fall	CSC 4222/6222	53	Fundamentals of Cybersecurity
		CSC8930	6	M.S. Project
2021	Summer	CSC 1302	53	Principles of Computer Programming II
2021	Spring	CSC 4220/6220	53	Computer Networks
		CSC 1302	78	Principles of Computer Programming II
2020	Fall	CSC8220	30	Advanced Computer Networks
2020	Summer	CSC 1302	66	Principles of Computer Programming II
2020	Spring	CSC 4220/6220	41	Computer Networks
		CSC 1302	85	Principles of Computer Programming II
2019	Fall	CSC 8221	12	Optical/Wireless Networks
		CSC 8930	1	M.S. Project
		CSC 9999	1	Dissertation Research
2019	Summer	CSC 1302	37	Principles of Computer Programming II
2019	Spring	CSC 8220	29	Advanced Computer Networks
		CSC 9999	1	Dissertation Research

2018	Fall	CSC 4222/6222	45	Introduction to Cyber Security
		CSC 8930	2	M.S. Project
		CSC 9999	3	Dissertation Research
2018	Summer	CSC 1302	24	Principles of Computer Programming II
2018	Spring	CSC 8220	17	Advanced Computer Networks
		CSC 9999	2	Dissertation Research
2017	Fall	CSC 8221	11	Optical/Wireless Networks
		CSC 8930	6	M.S. Project
		CSC 9999	2	Dissertation Research
2017	Summer	CSC 1302	34	Principles of Computer Programming II
2017	Spring	CSC 8250	26	Advanced Network Architectures and Protocols
		CSC 8900/9900	23	Seminar in Computer Science
		CSC 8930	4	M.S. Project
		CSC9999	2	Dissertation Research
2016	Fall	CSC 8900/9900	51	Seminar in Computer Science
		CSC 8930	2	M.S. Project
		CSC 9999	2	Dissertation Research
2016	Summer	CSC 2310	57	Principles of Computer Programming II
2016	Spring	CSC 8220	22	Advanced Computer Networks
		CSC 8900/9900	27	Seminar in Computer Science
		CSC 8930	2	M.S. Project
		CSC9999	2	Dissertation Research
2015	Fall	CSC 8221	20	Optical/Wireless Networks
		CSC 8900/9900	40	Seminar in Computer Science
		CSC 8930	2	M.S. Project
2015	Summer	CSC 2310	24	Principles of Computer Programming
2015	Spring	CSC 8250	29	Advanced Network Architectures and Protocols
		CSC 8900/9900	28	Seminar in Computer Science
		CSC9999	4	Dissertation Research
2014	Fall	CSC 2310	72	Principles of Computer Programming
		CSC 8900/9900	37	Seminar in Computer Science
		CSC 8930	2	M.S. Project
		CSC 9999	4	Dissertation Research
2014	Summer	CSC 2310	38	Principles of Computer Programming
2014	Spring	CSC 8220	28	Advanced Computer Networks
		CSC 8900/9900	17	Seminar in Computer Science
		CSC 8930	3	M.S. Project
		CSC9999	3	Dissertation Research
2013	Fall	CSC 2310	53	Principles of Computer Programming
		CSC 8221	26	Optical/Wireless Networks
		CSC 9999	3	Dissertation Research
		CSC 4220	1	HON Computer Networks
2013	Summer	CSC 2310	40	Principles of Computer Programming
2013	Spring	CSC 8250	10	Advanced Network Architectures

		CSC 9999	3	Dissertation Research
2012	Fall	CSC 2310 - 005	46	Principles of Computer Programming
		CSC 2310 - 015	42	Principles of Computer Programming
		CSC 8930	1	M.S. Project
		CSC 9999	2	Dissertation Research
2012	Spring	CSC 8220	13	Advanced Computer Networks
		CSC 8910	5	Computer Science Topics Seminar
		CSC 9999	4	Dissertation Research
2011	Fall	CSC 8221	9	Optical/Wireless Networks
		CSC 9999	4	Dissertation Research
2011	Spring	CSC 8250	7	Advanced Network Architectures and Protocols
		CSC 8910	5	Computer Science Topics Seminar
		CSC 8999	1	Thesis Research
		CSC 9999	3	Dissertation Research
2010	Fall	CSC 2310	32	Principles of Computer Programming
		CSC 9999	4	Dissertation Research
2010	Spring	CSC 8220	7	Advanced Computer Networks
		CSC 8910	9	Computer Science Topics Seminar
		CSC 8930	1	M.S. Project
		CSC 8999	1	Thesis Research
		CSC 9999	2	Dissertation Research
		CSC 4999	1	Directed Readings
2009	Fall	CSC 4220/6220	17	Computer Networks
		CSC 8999	2	Thesis Research
		CSC 9999	1	Dissertation Research
2009	Spring	CSC 8220	8	Advanced Computer Networks
		CSC 8910	6	Computer Science Topics Seminar-Network Analysis
		CSC 8930	1	M.S. PROJECT
		CSC 8999	1	Thesis Research
		CSC 9999	1	Dissertation Research
2008	Fall	CSC 4220/6220	15	Computer Networks
		CSC 8930	2	M.S. PROJECT
		CSC 8950	1	Direct Research in CS
		CSC 9999	1	Dissertation Research
2008	Spring	CSC 8220	14	Advanced Computer Networks
		CSC 8910	3	Computer Science Topics Seminar
2007	Fall	CSC 4220/6220	11	Computer Networks
2007	Spring	4050-402	29	OS Scripting
		4002-897	2	Thesis Guidance
2006	Winter	4050-402	30	OS Scripting
2006	Fall	4050-341	31	Data Communications and Computer Networks
2006	Spring	4050-582/782	11	Wireless Ad-Hoc/Sensor Networks
		4050-599	2	Independent Study
2005	Winter	4050-582/782	16	Wireless Ad-Hoc/Sensor Networks

		4050-342	16	Principles of Networking
2005	Fall	4002-341	24	Data Communications and Computer Networks
		4002-342	17	Principles of Networking
		4002-519	6	Network Troubleshooting
2005	Spring	4002-522/822	5	Introduction to Network Programming
		4002-421	20	Systems Administration I
		4002-342	21	Internetworking Lab
2004	Winter	4002-402	25	OS Scripting
		4002-340	12	Computer Concepts and Software Systems
		4002-342	14	Internetworking Lab
2004	Fall	4002-341	11	Data Communications and Computer Networks
		4002-342	34	Internetworking Lab

B. *Student Supervision*

Ph.D. students supervised

(1) Yang Wang (2012), Dissertation: "Resource Management in Survivable Multi-Granular Optical Networks," Assistant Professor, La Salle University, Philadelphia, PA (was with Internap Corp. upon graduation).

(2) Qian Hu (2015), Dissertation: "Towards a Virtualized Next Generation Internet."

(3) Kebina Manandhar (2015), Dissertation: "Enhancing Security in the Future Cyber Physical Systems," Department of Computer Science, GSU

(4) Sunny Shakya (2015), Dissertation: "Management of Spectral Resources in Elastic Optical Networks," Ciena Corporation, Alpharetta, GA

(5) Chenguang Kong (2016), Dissertation: "Content Dissemination in Mobile Social Networks," FICO, San Diego, CA

(6) Maryamsadat Jalalitabar (2018), Dissertation: "Service Function Graph Design and Embedding in Next Generation Internet," Boston College

(7) Evrim Guler (2019), Dissertation: "Multicast Aware Virtual Network Embedding In Software Defined Networks"

(8) Danyang Zheng (2021), Dissertation: "Network Function Virtualization Service Delivery for Future Internet"

(9) Xueting Liao (co-advise with Dr. Yubao Wu) (2021), Dissertation: "Graph Mining and its Applications in Online Social Networks"

(10) Chengzong Peng (2022), Dissertation: "Service Function Protection in Network Function Virtualization"

(11) Yihan Zhong

(12) Anubha Mittal

Ph.D. thesis committee member

- 2024: (1) Alireza Marefatvayghani
- 2023: (1) Khadija Ashraf, (2) Brendan B. Camp
- 2022: (1) MD Rashed Rahman, (2) Ramya Tekumalla, (3) Jaya Krishna Mandivarapu
- 2021: (1) Christopher Freas, (2) Sudha Tushara Sadasivuni
- 2016: (1) Goutham Kamath; (2) Guoliang Liu; (3) Lei Shi

- 2013: Shouling Ji
- 2009: Vu Trung Chinh

M.S. thesis/project committee chair
- 2024: (1) Divya Sri Chakravaram, (2) Chandana Movva, (3) Dattu Reddy Maddur
- 2023: Bhargav Muppalla
- 2022: (1) Davidson Fleurantin, (2) Sowjanya Chintala, (3) Manichandan Valgot, (4) Surya Teja Yellutla, (5) Sonal Chavan, (6) Pavan Shivalingaiah
- 2021: (1) Amrita Biswas, (2) Saidarao Chirumamilla, (3) Rohan Kodangal Varala, (4) Krishna Mani Teja Katragadda, (5) Venus Pagidimarri
- 2020: (1) Veera Venkata Subramanya Aditya Bhamidipati, (2) Aishwarya Rajuladevi Manikyam
- 2019: Sheng Li
- 2018: (1) Chien Tung Chen; (2) Shubin Wu; (3) Swaroop Devaraju
- 2017: (1) Dileep Gunda; (2) Swetha Gatty; (3) Akshita Maradapu Vera Venkata Sai; (4) Siddarth Shekhar; (5) Brendan B. Camp; (6) Yung Tseng
- 2016: (1) Megan Smith; (2) Divya Aluvala; (3) Sri Shravya Basavaraju; (4) Kaushik Koneru
- 2015: Chyeeka Brown
- 2014: (1) Nabina Pradhan; (2) Hari Uday; (3) Jyoti Kumari; (4) Neha Kadu; (5) Stephen Mathew; (6) Quintin Ash
- 2012: (1) Barnali Chakrabarty; (2) Yufan Wang
- 2011: Vijetha Shivarudraiah
- 2010: Rahul Mallampati
- 2009: (1) Ranjitha Shivarudraiah; (2) Yichuan Wang
- 2007: Frank Suen
- 2006: Shenbo Liu

M.S. thesis/project committee member
- 2024: (1) Weizhen Liu
- 2023: (1) Ishu Goyal; (2) Sai Krishna Reddy Kandhadi
- 2022: (1) Varchaleswari Ganugapati; (2) Harsha Duddu
- 2021: (1) AbdulHaseeb Ahmed; (2) Kiruthiga Sekar; (3) Xinyu Hu; (4) Hsiu Yuan Fan
- 2019: (1) Huafu Hu; (2) Carlos Enrique Hearn
- 2016: (1) Tri Cao Hoang; (2) Valli Srilakshmi Devalla
- 2015: (1) Paritosh P. Ramanan; (2) Monjur Alam
- 2014: (1) Sri Vidya Yechuri; (2) Syambabu Pothini; (3) Srinivasa Satya Pradeep Nekkalapudi; (4) Kiran Sagar Kuruba; (5) Sree Vidya Naraharasetti; (6) Naga Manojna Chintapalli
- 2013: (1) Pridhvi Raj Ramanujula; (2) Xuhong Zhang; (3) Ben Adcock
- 2012: Syed Haque
- 2009: (1) Marco Valero; (2) Telvis Calhoun
- 2008: (1) Aravind Venkataraman; (2) James Reed Newman
- 2007: Daisuke Oka
- 2006: (1) Meng Jiang; (2) Bhushan Mehendale; (3) Thomas J. Lantier; (4) Justin J. Madigan

Visiting scholars under supervision

- Yu Chen — 2019-2020
- Shufen Niu — 2018-2019
- Jie Duan — 2018-2019
- Yuanyuan Zhang — 2018-2019
- Yu Hu — 2016-2016
- Bangju Wang — 2014-2015
- Sung-Woon Lee — 2014-2015
- Qifei Zhang — 2014-2015
- Min Mao — 2014-2015
- Huawei Zhang — 2013-2014
- Yuan Zhang — 2013-2014
- Ling Tian — 2013-2014
- Yimin Zhou — 2013-2013
- Ming Liu — 2012-2013
- Caifen Wang — 2010-2011
- Chaoyang Li — 2009-2010

VI.   Department and College Service

2024-present	University Senate Committee
	University Committee on Admissions & Standards
	University Committee on Academic Programs
2023-present	College Graduate Council
2022-2023	University Review Committee for the Stamps and Presidential Scholarships
	Ad-hoc School of Computing Plan Committee
	Strategic Planning Committee
	Academic Professional Search Committee
2021-2023	University Senate Committee
	University Committee on Research
	University Committee on Planning and Development
	Executive Committee, Chair
2021-2022	Academic Professional Search Committee, Chair
	Ad hoc Curriculum Committee
2019-2021	University Senate Committee
	Committee on Academic Programs
	CAP Subcommittee: Graduate Council
	Committee on Planning and Development
2016-present	Promotion & Tenure Committee
2020-2022	Faculty Search Committee
2020-2021	Bylaws Committee, Chair
2019-2020	Faculty Search Committee
2017-2019	Director of Graduate Studies
2014-2019	College Graduate Council
2014-2019	Graduate Committee, chair

2017-2018	College P&T Area Committee
2017-2018	College Strategic Planning Working Group
2016-2017	Faculty Search Committee, Chair
2014-2017	Acting Director of Graduate Studies
2016-2017	Academic Program Review Committee
2014-2015	Bylaws Committee, Chair
2011-2015	GSU Internal Grants Review Committee
2011-2012	Triennial Chair Evaluation Committee
2010-2014	Executive Committee
	Promotion & Tenure Committee
2010-2011	Faculty Search Committee
2007-2014	Curriculum Committee
	Library Committee
	Graduate Committee
	Ph.D. Qualifying Examination Committee
2006-2007	College Ph.D. Committee
	Assessment Committee
2005-2007	Curriculum Committee
2005-2007	Faculty Search Committee
2004-2006	College Ph.D. Program Preparation Committee
2004-2005	IT Department Facilities Committee
	ANSA Assessment Committee

VII.   Professional Services/Activities

- Senior Member of IEEE and its Communications Society, ACM
- IEEE ComSoc TC Restructure Sub-Committee (2022-2024)
- IEEE Distinguished Lecture (2020-2022)
- Nomination and Election (N&E) Subcommittee, IEEE Optical Networking Technical Committee (ONTC) (2021)
- Chair of the IEEE Optical Networking Technical Committee (ONTC) (2017-2019)
- Vice Chair of the IEEE Optical Networking Technical Committee (ONTC) (2015-2017)
- Elected Secretary of the IEEE Optical Networking Technical Committee (ONTC) (2013-2015)

Review Panels
- Canada NSERC Discovery (2018-2019, 2020, 2021)
- NASA Postdoctoral Program Review (2011, 2012)
- National Science Foundation (NSF) (2007, 2013, 2017)
- NSF Global Environment for Network Innovations (GENI) (2008, 2009, 2010, 2013,2022, 2024-05)
- US Department of Energy (2008, 2009, 2010, 2012, 2015)
- **Proposal Reviewing,** for Rochester New York WXXI Public Broadcasting Council, 2006

Editorships

- **Guest Editor**, IEEE Wireless Communications (2022 – 2023)
- **Editor**, Elsevier Computer Networks (since 2019)
- **Associate Editor,** Springer Photonic Network Communications Journal (since 2013)
- **Associate Editor**, Elsevier Computer Communications (since 2013)
- **Associate Technical Editor**, IEEE Communications Magazine (2017 - 2022)
- **Associate Editor,** IEEE Communications Letters 2009-2014
- **Guest Editor,** Tsinghua Science and Technology, 2012

Conference/Workshop Organizing Committee

- IEEE HPSR'20, Technical Program Co-Chair
- ICNC'20 OGC, Symposium Co-Chair
- IEEE ICC'19, ONS Symposium Co-Chair
- IEEE BDCloud 2016, Technical Program Co-Chair
- IEEE GLOBECOM'16 NGN Symposium Co-Chair
- Publicity Chair, PICom 2014
- Local Chair, 2nd International IBM Cloud Academy Conference ICA CON 2014
- Workshop Chair, iWON'13, December, Atlanta, GA USA
- Selection Committee of 2013 IEEE ComSoc Student Competition "Communications Technology Changing the World"
- Workshop Co-chair, CSA-13, Dec. 18-21, 2013, Danang, Vietnam
- Symposium Co-Chair, International Conference on Computing, Networking and Communications (ICNC) 2013
- Program Co-Chair, The 4th FTRA International Conference on Computer Science and its Applications 2012
- Program Co-Chair, International Conference on Algorithms and Architectures for Parallel Processing 2010
- Track Co-Chair, AMCIS 2011
- Organizing Committee, RIT-VoIP workshop 2006, IEEE Upstate NY Workshop on Communications and Networking 2005; RIT VoIP Mini-Summit 2005; 1st and 2nd International Workshop on Optical Burst Switching
- Vice-chair, IEEE Joint chapter on Communications and Aerospace, Rochester, 2005-2006

Session Chair, for conferences and workshops

- INFOCOM'20, HPSR'20, ICC 2019, ICC 2018, INFOCOM 2017, GLOBECOM 2016, GLOBECOM 2014, ICCCN 2014/2015, ICCCN 2013

Technical Program Committee, for dozens of conferences and workshops, including

- **2022**, IEEE INFOCOM'23
- **2021**, CRC Book Review, IEEE INFOCOM'22
- **2020**: IEEE INFOCOM'21, HPSR'21
- **2019**: IEEE INFOCOM'20, HPSR'20
- **2018**: IEEE ICC'19, GLOBECOM'19
- **2017**: IEEE INFOCOM'18, UB ETC'17, IEEE ICC'18

- **2016**: IEEE INFOCOM'17, TECON'17, IEEE ICC'17
- **2015**: IEEE ICC'16, NaNA2016, IEEE INFOCOM'16
- **2014**: IEEE INFOCOM'15, IEEE INFOCOM'14,
- **2013**: IEEE INFOCOM'13, IEEE GLOBECOM'13
- **2012**: IEEE INFOCOM'12, IEEE ICC'12, IEEE GLOBECOM'12
- **2011:** IEEE ICC'11, IEEE GLOBECOM'11, COIN/PS 2011, IEEE HSN'11, iCOST'11, ISPA'2011
- **2010:** IEEE GLOBECOM'10, I EEE ICCCN'10, LOCALGOS'10, ACP 2010
- **2009:** IEEE ICC'09, ICA3PP 2009, APOC'09
- **2008:** IEEE ICC'08, IEEE GLOBECOM'08, IPDPS'08, LCN'08, ICA3PP'08, PDCAT'08,
- **2007:** IEEE ICC'07, IEEE GLOBECOM'07, IEEE WLN'07, IEEE ICCCN'07, IEEE BROADNETS'07,
- **2006:** IEEE ICC'06, IEEE GLOBECOM'06, BROADNETS'06, CAMPS'06, SensorWare'06, IEE Mobility Conference'06
- **2005:** IEEE GLOBECOM'05, ICETE2005, IEEE WirelessCOM 2005, IWOBS'05

Panel Speaker, Panel on Integrated Optical and Wireless Technologies for Broadband Access and Metro Networks Optical Networks (along with S. Dixit of Nokia Research Center, and T. Wang of NEC Laboratories America, and C. Qiao of SUNY at Buffalo), IEEE WoWMoM, Niagara Fall, NY, Jun. 2006

Ad Hoc Referee for: Books from Springer Publisher, John Wiley & Sons, CRC, many journals/magazines and conferences/workshops including: IEEE/ACM Transactions on Networking, IEEE Transactions on Human-Machine Systems, IEEE Transactions on Computers, ACM, Transactions on Privacy and Security, IEEE Internet of Things Journal, IEEE Transactions on Network Science and Engineering, IEEE Journal on Selected Areas in Communications (JSAC), IEEE Transactions on Parallel and Distributed Systems(TPDS), Journal of High-Speed Networks, ACM/Kluwer Mobile Networks and Applications (MONET), OSA Journal of Optical Communications and Networking (JOCN), Journal of Computer Science and Technology(JCST), Elsevier Journal of Optical Switching and Networking (OSN), Journal of Network and Systems Management(JNSM), IEEE/OSA Journal of Lightwave, Journal of Computer Network, International Journal of Computers and Applications, Optics Express Journal, Journal of Supercomputing, Journal of the Network and Systems Management (JONS), Journal of Network and Computer Applications (JNCA), IEEE Computer Networks, IEEE Transactions on Computers, IEEE Photonics Technology Letters, IEEE Communication Magazine, IEEE Communication Letter, Wiley Wireless Communications and Mobile Computing, Elsevier Computer Networks, IEEE IPDPS08, IEEE Infocom04, IEEE Infocom05, IEEE Globecom05, IEEE Globecom06, IEEE ICC05, IEEE ICC06, IEEE BroadNets05, IEEE BroadNets06, ONDM05, ITCC05, ITRE05, ICETE05, IPSI2005, ADCOM 05, WOBS 2005, WOBS2006 ISWPC 2006, IEEE CHINACOM-Comm'2006, MILCOM'10

VIII. Awards and Honors

- Excellent Paper Award, Big Data Mining and Analytics Journal, 2020

- NSF CAREER Award, 2006–2011
- New York State Professional Development Award, 2003
- IEEE Communications Society Grants for attending INFOCOM, 2003
- Teaching/research assistantship and full tuition scholarship from CSE department, State University of New York at Buffalo, fall 1999 - spring 2004
- Student Travel Award, CSE Graduate Student Association, SUNY at Buffalo, 2002 & 2003
- SPIE Student Travel Award for attending OptiComm Conference, 2002
- Student Travel Award, UB Graduate Student Association, SUNY at Buffalo, 2002
- Excellent Master's thesis award from DSP Center, Institute of Acoustics, Chinese Academy of Sciences, 1999
- Awarded Excellent Student Scholarship by Tsinghua University for four school years, 1991–1996