
DAVID TIPPER

Graduate Telecommunications and Networking Program
School of Computing and Information, University of Pittsburgh
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RESEARCH INTERESTS

Communication network design, network performance evaluation and information assurance techniques.

EDUCATION

PhD in Electrical Engineering University of Arizona, Tucson, AZ, USA	August 1988
MS in Systems Engineering University of Arizona, Tucson, AZ, USA	June 1984
BS in Electrical Engineering Virginia Tech, Blacksburg, VA, USA	June 1980

PROFESSIONAL EXPERIENCE

- *Professor, Graduate Telecommunications and Networking Program (7/01/15 – present)*
School of Computing and Information
University of Pittsburgh, Pittsburgh, PA, USA (Associate Professor 7/01/94 – 6/30/15)
 - Teaching courses in communication systems, wireless networks, network performance analysis techniques, network design, computer networks and infrastructure protection.
 - Conducting research and supervising student theses in communication networks, with a focus on network design, network operation (routing, congestion control, etc.), information assurance and performance evaluation.
 - Co-founder of Wireless Information Systems research and teaching lab and developer of associated graduate curriculum.
 - Co-founder of Laboratory for Education and Research on Security Assured Information Systems and associated information assurance graduate curriculum.
- *Director of Graduate Telecommunications and Networking Program*
School of Information Sciences
University of Pittsburgh, Pittsburgh, PA, USA (11/01/07 – 06/30/15)
 - Responsible for administrative duties associated with the Master's and PhD Telecommunications and Networking degree programs and with the undergraduate Network and Security track in the undergraduate BS Information Science degree.
- *Adjunct Professor II, Department of Informatics*
Molde University College, Molde, Norway (<http://www.himolde.no>) (7/01/98-7/01/07)
 - Conducted joint research with Molde faculty, consulted on curriculum development and served as point of contact for University of Pittsburgh - Molde exchange program. Taught short courses on wireless networks.

- *Associate Professor, Electrical and Computer Engineering Department*
Clemson University, Clemson, SC, USA (Associate, 6/93 – 7/94, Assistant, 6/87 – 6/93)
 - Taught courses in the areas of communication networks, signal processing and control theory. Conducted research and supervised student theses in communication networks.
 - Received Outstanding Undergraduate ECE Teacher Award 1989.
- *Associate Director of Center for Computer Communication Systems (CCCS)*
Clemson University, Clemson, SC, USA (11/92 – 7/94)
 - Responsible for fund raising and external affairs of CCCS, a state-funded college of engineering research center, including the development of marketing material, corporate fund raising and organization of annual sponsor's conference.
- *Member of Technical Staff, Networking Technology Center*
MITRE Corporation, Reston, VA, USA (Summer 1992)
 - Conducted protocol evaluation of proposed Naval packet radio network and study of routing in FAA Aeronautical Telecommunication Network
- *Graduate Research Assistant, Electrical and Computer Engineering Department*
University of Arizona, Tucson, AZ, USA (6/84 – 8/87)
 - Conducted research for the following projects: (1) ISDN deployment for US Army base, (2) feasibility of secure communication as a phone company service, and (3) development of real time infrared ship classifier.
- *Graduate Teaching Assistant, Systems and Industrial Engineering Department*
University of Arizona, Tucson, AZ, USA (8/82 – 6/84)
 - Taught Introduction to Programming and Introduction to Numerical Analysis courses.
- *Systems Engineer, Flight Simulation Division*
Singer-Link, Houston, TX, USA (6/80 – 8/82)
 - Responsible for the development of software to simulate various subsystems and payloads of the Space Shuttle for NASA's space shuttle mission simulator
 - Received Outstanding Employee of the Quarter Award, 3rd Quarter, 1981
- *Paid Consultant (partial list) (8/88 – present)*
 - Various networking - related research and development consulting projects with a variety of corporations such as: IBM, BellSouth, Benchmark Photonics and Apple.

RESEARCH GRANTS (TOTAL TO DATE \$4,114,286)

1. J. Joshi, P. Krishnamurthy, D. Tipper, "Towards Insider Threat Assessment and Mitigation," *National Security Agency*, 10/01/15 – 8/30/17, \$284,580.
2. M. Weiss, P. Krishnamurthy, D. Tipper, "Techno-Economic Models of Secondary Spectrum Use," *National Science Foundation EARS Program*, 9/01/12 – 8/30/17, \$484,962.
3. K. Trivedi, D. Medhi and D. Tipper, "MiMANSaS: Metrics, Models and Analysis of Network Security and Survivability" *National Science Foundation CT-ER Program*, 09/01/08 – 08/30/10, \$169,834
4. D. Tipper, J. Joshi, and P. Krishnamurthy, "Dynamic Data Driven Defense Mechanisms for Cybersecurity," *National Science Foundation CSR-SGER Program*, 8/1/07-7/30/09, \$104,000.
5. P. Mohapatra, S. F. Wu, K. Levitt, J.J.Garcia-Luna-Aceves, T. La Porta, G. Cao, S. Krishnamurthy, M. Faloutsos, P. Krishnamurthy, D. Tipper, S. Kasera, L. Swindlehurst, M. Jensen, "ARSENAL: A cross layer Architecture for Secure resilient tactical mobile ad hoc

networks,” *Army Research Office MURI Grant*, 7/01/07 – 11/30/13, \$6,500,000 (PI of University of Pittsburgh portion \$715,000).

6. D. Mosse and D. Tipper, “Advanced Networking for Instrumentation and Control of Nuclear Powered Ships and Submarines,” *Bechtel Bettis Inc.*, 5/01/07-8/30/07, \$50,000.
7. D. Tipper and T. Dahlberg, “Design and Restoration Techniques for Fault Tolerant Wireless Access Networks,” *National Science Foundation ANIR Program*, 9/15/00 - 9/15/04, \$300,000. Supplemented by “NSF Research Experience for Undergraduates,” 6/01/01-12/30/01, \$12,000
8. P. Krishnamurthy, D. Tipper, J. Kabara, “A Survivable and Secure Wireless Information Architecture,” *National Institute of Standards (NIST) Critical Infrastructure Protection Grant*, 08/01 - 08/03, \$432,076.
9. D. Medhi and D. Tipper, “Self-Configuring Multi-Networks for Information Systems Survivability,” *Defense Advanced Research Projects Agency (DARPA)*, 7/1/97 - 6/30/00, \$1,251,241.
10. D. Tipper and D. Medhi, “Network Design and Traffic Recovery Procedures for Survivable Wide Area Networks,” *National Science Foundation CCR Program*, 8/95 - 6/98, \$274,097. Supplemented by “NSF Research Experience for Undergraduates,” 8-12/96, \$5,000.
11. S. Banerjee, D. Tipper, M. Weiss, and T. Znati, “Measurement and Testing Tools for Networking Protocols and Products,” *Strategic Networks Consulting Incorporated (SNCI)*, 1/97 - 8/97, \$19,962.
12. T. Znati and D. Tipper, “Network Design and Evolution for Integration of Mobility Management into Broadband Public Network Infrastructure,” *Bellcore*, 9/96 - 12/96, \$10,700.
13. S. Banerjee, D. Tipper, and M. Weiss, “Wide Area ATM Traffic Measurement and Modeling on the vBNS,” *MCI*, 8/95 - 12/96, \$78,073.
14. D. Tipper, “Development of Methods for Studying the Transient/Nonstationary Behavior of Communication Networks,” *IBM*, 7/93 - 12/94, \$70,000.
15. D. Tipper, “A Novel Scheme for Buffer Management in an ATM Switch,” *Clemson University Technology Transfer Fund*, 1/93 - 6/93, \$13,500
16. D. Tipper and J. Hammond, “A Study of Network Recovery from Link and Node Failure With Emphasis on Transient Behavior of Routing Algorithms,” *IBM*, 1/91 - 5/92, \$100,000.
17. D. Tipper, “Modeling the Nonstationary Behavior of Communication Networks,” *State of South Carolina*, 5/90 - 12/90, \$23,841.

CURRICULUM, EQUIPMENT AND SCHOLARSHIP GRANTS (TOTAL TO DATE \$4,804,715)

1. M. Spring, J. Joshi, P. Krishnamurthy, D. Tipper and M. Weiss, “Standards: People, Process, Products and Productivity Focus on Information Technology Standards,” *National Institute of Standards and Technology*, 12/01/13 – 12/01/14, \$100,000.
2. J. Joshi, P. Krishnamurthy, M. Spring, D. Tipper, “A Scholarship Program for Security Assured Information Systems Track,” *National Science Foundation Federal Cyberservice Program*, 8/11/11 – 8/11/16, \$2,055,553.
3. J. Joshi, P. Krishnamurthy, M. Spring, D. Tipper, “A Scholarship Program for Security Assured Information Systems Track,” *National Science Foundation Federal Cyberservice Program*, 8/11/06 – 8/11/10, \$1,055,553.
4. M. Spring, J. Joshi, P. Krishnamurthy, and D. Tipper, “A Curriculum for Security Assured Information Systems,” *National Science Foundation Federal Cyberservice program*, 09/01/04 – 09/01/06, \$286,700.
5. J. Joshi, P. Krishnamurthy, D. W. Tipper, M. B. Spring, “Capacity Building (Research + Equipment) and IRMC Partnership”, *DoD LASP*, 8/01/06 – 7/31/07, \$55,000.

6. D. Tipper and P. Krishnamurthy, "Educational Materials Development for a Mobile Information Systems Course," *National Science Foundation CCLI-Educational Materials Development Program*, 01/04/04 – 12/30/05, \$50,000.
7. P. Krishnamurthy, J. Kabara, and D. Tipper, "Educating a Wireless Information Systems Workforce," *National Science Foundation ITR Program*, 9/01/00 - 9/01/03, \$394,000. "Research Experience for Undergraduates," supplement, 6/02 - 6/03, \$12,000, "Research Experience for Teachers," supplement, 7/02 - 7/03, \$25,000.
8. P. Krishnamurthy, D. Tipper, and J. Kabara, "Proposal to Educate a Wireless Information Systems Workforce," *Commonwealth of Pennsylvania Information Technology Workforce Development Grant* 5/00 – 4/02, \$470,000.
9. J. Kabara, M. Weiss, D. Tipper, and P. Krishnamurthy, "Continuing Development of the Wireless Curriculum at the University of Pittsburgh," *AT&T Foundation*, 7/1/00 - 6/30/01, \$100,000.
10. D. Tipper, "NASA Earth Science Fellowship," *NASA*, 7/96 - 7/98, \$44,000
11. W. Ligon, D. Tipper, Dawson, C. Butler, W. Pearson, "CISE Research Instrumentation," *National Science Foundation*, 1/94 - 1/95, \$156,897 for research lab equipment.

Grants where I was listed as Sr. Personnel or received support (Total to date \$2,547,055)

1. J. Joshi, K. Pelechris, B. Palanisamy, B. Parmanto, P. Krishnamurthy, "A Curriculum for Security Assured Health Informatics," *NSF DGE*, 09/01/14 – 08/31/17, \$897,055.
2. R. Hayden, M. Weiss, "Kosovo Telecommunications Education Project," *USAID Higher Education Development Grant*, 7/01/08- 6/30/11, \$450,000.
3. H. Karami, S. Hirtle, "Geoinformatics Curriculum," *Commonwealth of Pennsylvania Information Technology Workforce Development Grant*, 5/00 - 4/02, \$1,200,000.

Publications (Citations according to Google Scholar: 4520, h-index 30, i10-index 83)

Books

1. Yi Qian, James Joshi, David Tipper, and Prashant Krishnamurthy, *Information Assurance: Dependability and Security in Networked Systems*, Morgan Kaufmann, 2008.
2. R. Thompson, D. Tipper, J. Kabara and P. Krishnamurthy, *The Physical Layer of Communication Systems*, Artech House, 2006.

Book Chapters

1. T. Dahlberg, D. Tipper, B. Cao, and C. Charnsripinyo, "Survivability in Wireless Mobile Networks," pp. 81-114 in *Reliability, Survivability, and Quality of Large Scale Telecommunication Systems*, Ed. P. Stavroulakis, John Wiley & Sons, London, England, 2003.
2. D. Tipper and D. Dawson, "A Bound on the Settling Time of Finite Markov Processes," pp. 159-170 in *Probability Models and Statistics*, Eds. A. C. Borthakur and H Choudhury, New Age International Publishers, London, England, 1996.
3. D. Tipper, S. Pappu, A. Collins, and J. George, "Space Priority Buffer Management for ATM Networks," pp. 157-166 in *ATM Networks*, Eds. H. Perros and I. Viniotis, Plenum Press, New York, NY, 1993.

Edited Proceedings

1. J. Rak, D. Tipper and K. Walkowiak (Eds.), *Proceedings of Second International Workshop on Reliable Networks Design and Modeling (RNDM 2010)*, Moscow, Russia, October 19-20, 2010. IEEE Press, ISBN 978-1-4244-7283-3, 2010.

2. D. Medhi, J. Doucette and D. Tipper, *Proceedings of Seventh International Workshop on Design of Reliable Communication Networks (DRCN 2009)*, Washington, DC, USA, Oct 25-29, 2009, IEEE Press, ISBN 978-1-4244-5048-0, 2009.

Journal Articles

1. A. Alashaikh, D. Tipper and T. Gomes, "Exploring the Logical Layer to Support Differentiated Resilience Classes in Multilayer Networks," *Annals of Telecommunications*, Vol. 73, No 1-2, pp. 63-79, Feb., 2018
2. L. Martins, T. Gomes and D. Tipper, "Efficient Heuristics for Determining Node-Disjoint Path Pairs Visiting Specified Nodes," *Networks*, Vol. 70, No 4, pp. 292-307, Dec., 2017
3. B. Bhattarai, M. Levesque, B. Bak-Jensen, J. Pillai, M. Maier, D. Tipper and K. Myers, "Design and Co-simulation of Hierarchical Architecture for Demand Response Control and Coordination," *IEEE Transactions on Industrial Informatics*, Vol. 13, No. 4, pp. 1806-1816, August, 2017.
4. L. Cui, M Weiss, B. Morel, and D. Tipper, "Risk and Decision Analysis of Dynamic Spectrum Access," *Telecommunications Policy*, Vol. 41, Issues 5-6, pp. 405-421, June, 2017.
5. H. Beyranvand, M. Levesque, M. Maier, J. Salehi, C. Verikoukis, and D. Tipper, "Toward 5G: FiWi Enhanced LTE-A HetNets With Low-Latency Fiber Backhaul and WiFi Offloading," *IEEE/ACM Transactions on Networking*, Vol. 25, No. 2, pp. 690-707, April, 2017.
6. T. Gomes, L. Martins, S. Ferreira, M. Pascoal, and D. Tipper, "Algorithms for determining a node-disjoint path pair visiting specified nodes," *Optical Switching and Networking*, Vol. 23, Part 2, pp. 189-204, Jan, 2017. DOI: 10.1016/j.osn.2016.05.002
7. M. Levesque and D. Tipper, "A Survey of Clock Synchronization Over Packet-Switched Networks," *IEEE Communications Surveys and Tutorials*, Vol. 18, No. 4, pp. 2926-2947, Fourth Quarter, 2016. DOI: 10.1109/COMST.2016.2590438
8. X. Long, D. Tipper and Y. Qian, "A Key Management Architecture and Protocols for Secure Smart Grid Communications," *Security and Communication Networks*, Vol. 9, No. 16, pp. 3602-3617, Nov., 2016.
9. K. Xu, D. Tipper, Y. Qian, and P. Krishnamurthy, "Time Dependent Performance Analysis of IEEE 802.11p Vehicular Networks," *IEEE Transactions on Vehicular Technology*, Vol. 65, No. 7, pp. 5637-5651, July, 2016.
10. V. Kounev, M. Levesque, D. Tipper, and T. Gomes, "Reliable Communication Networks for Smart Grid Transmission Systems," *Journal of Network and Systems Management*, (Special Issue on Survivable and Resilient Communication Networks and Services), Vol. 24, No. 3, pp. 629-652, July, 2016.
11. X. Wang, P. Krishnamurthy and D. Tipper, "On Configuring Radio Resources in Virtualized Fractional Frequency Reuse Cellular Networks," *Computer Communications*, Vol. 79, pp. 78-91, April, 2016.
12. J. Silva, T. Gomes, D. Tipper, L. Martins and V. Kounev, "An Effective Algorithm for Computing All-terminal Reliability Bounds," *Networks*, Vol. 66, No. 4, pp. 282-295, Dec., 2015.
13. V. Kounev, D. Tipper, A. Yavuz, B. Grainger and G. Reed, "A Secure Communication Architecture for Distributed Microgrid Control," *IEEE Transactions on Smart Grid*, Vol. 6, No. 5, pp. 2484-2492, Sept., 2015.
14. A. Alashaikh, T. Gomes and D. Tipper, "The Spine Concept for Improving Network Availability," *Computer Networks*, Vol. 82, pp. 4-19, May, 2015.

15. T.-H. Kim, D. Tipper and P. Krishnamurthy, "Improving the Performance of Multi-Hop Wireless Networks by Selective Transmission Power Control," *Journal of Information Communication Convergence Engineering*, Vol 13. No. 1, pp. 7-14, March, 2015.
16. K. Xu, D. Tipper, Y. Qian, P. Krishnamurthy and S. Tipmongkonsilp, "Time Varying Performance Analysis of Multihop Wireless Networks with CBR Traffic," *IEEE Transactions on Vehicular Technology*, Vol 63, No. 7, pp. 3397-3409, Sept., 2014.
17. X. Long, D. Tipper and T. Gomes, "Measuring the Survivability of Networks to Geographic Correlated Failures," *Optical Switching and Networking*, Vol. 14, Part 2, pp. 117-133, August, 2014.
18. D. Tipper, "Resilient Network Design: Challenges and Future Directions," *Telecommunication Systems*, Vol. 56, No. 1., pp. 5-16, May, 2014
19. D. Schupke, O. Gonzalez De Dios and D. Tipper, "Advances in Network Planning – Part II: Wireless Networks and Traffic Uncertainty [Guest Editorial]," *IEEE Communications Magazine*, Vol. 52, No. 2, pp. 146, 2014.
20. D. Schupke, O. Gonzalez De Dios and D. Tipper, "Advances in Network Planning – Part I: Fixed Networks and Clouds [Guest Editorial]," *IEEE Communications Magazine*, Vol. 52, No. 1, pp. 24-25, 2014.
21. S. T. Zargar, J. Joshi, and D. Tipper, "A Survey of Defense Mechanisms Against Distributed Denial of Service (DDoS) Flooding Attacks," *IEEE Communications Surveys and Tutorials*, Vol. 15, No. 4, pp. 2046-2069, Fourth Quarter, 2013.
22. T.-H. Kim, D. Tipper and P. Krishnamurthy, "Localized Algorithm to Improve Connectivity and Topological Resilience of Multi-Hop Wireless Networks," *Journal of Information Communication Convergence Engineering*, Vol 11. No. 2, pp. 69-81, June, 2013.
23. X. Wang, P. Krishnamurthy, and D. Tipper, "Wireless Network Virtualization," *Journal of Communications*, Vol. 8, No. 5, pp. 337-344, May, 2013.
24. M. Weiss, D. Tipper and R. Hayden, "Developing a Telecommunications Program for the Republic of Kosovo", *University of Pittsburgh Law Review*, Vol. 74, No. 3, pp. 665-667, Spring 2013.
25. V. Y. Liu and D. Tipper, "Spare capacity allocation using shared backup path protection for dual link failures," *Computer Communications*, Vol. 36, No. 6, pp. 666-677, March, 2013.
26. Y. Yan, Y. Qian, H. Sharif and D. Tipper, "A Survey on Smart Grid Communications Infrastructures: Motivations, Requirements and Challenges," *IEEE Communications Surveys and Tutorials*, Vol. 15, No. 1, pp. 5-20, First Quarter, 2013.
27. K. Vajanapoom, D. Tipper and S. Akavipat, "Risk Based Resilient Network Design," *Telecommunication Systems*, Vol. 52, No. 2, pp. 799-811, Feb., 2013.
28. J. Rak, D. Tipper and K. Walkowiak "Reliable Networks Design and Modeling," forward to Special Issue of *Telecommunication Systems*, Vol. 52., No. 2., pp. 701-703, Feb., 2013.
29. Y. Yan, Y. Qian, H. Sharif and D. Tipper, "A Survey on Cyber Security for Smart Grid Communications," *IEEE Communications Surveys and Tutorials*, Vol. 14, No. 4, pp. 998-1010, Fourth Quarter, 2012.
30. A. Aksu, P. Krishnamurthy, D. Tipper and O. Ercetin, "On Security and Reliability using Cooperative Transmissions in Sensor Networks," *Mobile Networks and Applications*, Vol. 17, No. 4, pp. 526-542, August, 2012.
31. T. Hayajneh, P. Krishnamurthy, D. Tipper and T. Le, "Secure Neighborhood Creation in Wireless Ad Hoc Networks using Hop Count Discrepancies," *Mobile Networks and Applications*, Vol. 17, No. 3, pp. 415-430, June, 2012.

32. T. Hayajneh, R. Doomun, P. Krishnamurthy and D. Tipper, "Source-Destination Obfuscation in Wireless Ad hoc Networks," *Security and Communication Networks*, Vol. 4, No. 8, August, 2011.
33. Y. Qian, K. Lu, B. Rong and D. Tipper, "Design of an optimal key management scheme for secure and survivable wireless sensor network," *Security and Communication Networks*, Vol. 1, No. 1, Jan./Feb., 2008.
34. Y. Qian, K. Lu and D. Tipper, "A Design for Secure and Survivable Wireless Sensor Networks," *IEEE Wireless Communications*, Vol. 14, No. 5, October, 2007.
35. Y. Liu, D. Tipper, and K. Vajanapoom, "Spare Capacity Allocation in Two-Layer Networks," *IEEE Journal on Selected Areas in Communications (JSAC)*, Vol. 25, No. 5, pp. 974-986, June, 2007.
36. X. Hou, D. Tipper and S. Wu, "Gossip-based Energy Conservation in Wireless Ad Hoc and Sensor Networks," *Journal of Network and Systems Management*, special issue on *Management of Wireless Ad Hoc Networks and Wireless Sensor Network*, Vol. 14, No. 3, 2006.
37. X. Hou, D. Tipper and S. Wu, "A Traffic Aware Power Management Protocol for Wireless Ad Hoc Networks," *Journal of Communications*, Vol. 1, No. 2, pp. 38-47, May, 2006.
38. P. Siripongwutikorn, S. Banerjee and D. Tipper, "Fuzzy Based Adaptive Bandwidth Control for Loss Guarantees," (Special Issue on Adaptive Learning Systems in Communication Networks) *IEEE Transactions on Neural Networks*, Vol. 16, No. 5, pp. 1147-1162, Sept., 2005.
39. W. Grover and D. Tipper, "Design and Operation of Survivable Networks," *Journal of Network and Systems Management*, Special Issue on Designing and Managing Optical Networks and Services for High Reliability, Vol. 13, No. 1, pp. 7-11, March, 2005.
40. Yu Liu, D. Tipper, and P. Siripongwutikorn, "Approximating Optimal Spare Capacity Allocation by Successive Survivable Routing," *ACM/IEEE Transactions on Networking*, Vol. 13, No. 1, pp. 198-211, Feb., 2005.
41. B. Jager and D. Tipper, "Prioritized Traffic Restoration in Connection Oriented QoS Based Networks," *Computer Communications*, Vol. 26, No. 18, pp. 2025-2036, Dec., 2003.
42. P. Siripongwutikorn, S. Banerjee, and D. Tipper, "A Survey of Adaptive Bandwidth Control Algorithms," *IEEE Communications Surveys and Tutorials*, Vol. 5, No. 1, pp. 2-14, Third Quarter, 2003.
43. D. Tipper, T. Dahlberg, H. Shin, and C. Charnsripinyo, "Providing Fault Tolerance in Wireless Access Networks," *IEEE Communications Magazine*, Vol. 40, No. 1, pp. 58-64, Jan, 2002.
44. B. Gronkinsky, D. Medhi, and D. Tipper, "An Investigation of Adaptive Capacity Control Schemes in a Dynamic Traffic Environment," *IEICE Transactions on Communication*, Vol. E84-B, No. 2, pp. 262-274, Feb., 2001.
45. D. Medhi and D. Tipper, "Approaches to Solving a Multi-Hour Broadband Network Capacity Design Problem with Single Path Routing," *Telecommunications Systems*, pp. 269-291, Vol. 13, No. 2, 2000.
46. S. Banerjee, D. Tipper, M. Weiss, and A. Khalil, "Traffic Experiments on the VBNS Wide Area ATM Network," *IEEE Communications Magazine*, Vol. 35, No. 8, pp. 126-133, August, 1997.
47. D. Medhi and D. Tipper, "Towards Fault Recovery and Management in Communication Networks," *Journal of Network and Systems Management*, Vol. 5, No. 2, pp. 101-103, June, 1997.
48. A. Pitsillides, J. Lambert, and D. Tipper, "A Multilevel Optimal Control Approach to Dynamic Bandwidth Allocation in Broadband ISDN," *Telecommunication Systems*, Vol. 4, No. 1, pp. 71-96, 1995

49. W. Yeh, J. L. Hammond, and D. Tipper, "Design and Evaluation of a Method for Admission Control for Broadband Packet Networks," *Computer Networks and ISDN Systems*, Vol. 27, No. 8, pp. 1349-1366, 1995.
50. D. Tipper, J. Hammond, S. Sharma, A. Khetan, K. Balakrishnan, and S. Menon, "An Analysis of the Congestion Effects of Link Failures in Wide Area Networks," *IEEE Journal on Selected Areas in Communications*, Vol. 12, No. 1, pp. 179-192, Jan., 1994.
51. R. Lackman, J. Spragins, and D. Tipper, "Scheduling Real Time and Non-Real Time Traffic Under Nonstationary Conditions," *Annals of Operations Research*, Vol. 36, pp. 193-224, 1992
52. D. Tipper and M. K. Sundareshan, "Numerical Methods for Modeling Computer Networks Under Nonstationary Conditions," *IEEE Journal on Selected Areas in Communication*, Vol. 8, No. 9, pp. 1682-1695, Dec., 1990.
53. W. Lovegrove, J. L. Hammond, and D. Tipper, "Simulation Methods for Studying Nonstationary Behavior of Computer Networks," *IEEE Journal on Selected Areas in Communication*, Vol. 8, No. 9, pp. 1696-1708, Dec., 1990.

Refereed Conference Proceedings Papers (ACCEPTANCE BASED ON FULL PAPER REVIEW)

1. A. Alqahtani, R. Abhishek, D. Tipper and D. Medhi, "Disaster Recovery Power and Communications for Smart Critical Infrastructures" *Proceedings IEEE International Conference on Communications (ICC 2018)*, Kansas City, MO, May, 2018.
2. X. Liu, M. Abdelhakim, P. Krishnamurthy, D. Tipper, "Identifying Malicious Nodes in Multihop IoT Networks using Diversity and Unsupervised Learning," *Proceedings IEEE International Conference on Communications (ICC 2018)*, Kansas City, MO, May, 2018.
3. A. Alashaikh, D. Tipper and T. Gomes, "Designing a High Availability Subnetwork to Support Availability Differentiation," *Proceedings 14th IEEE Design of Reliable Communication Networks (DRCN 2016)*, Paris, France, Feb. 19 , 2018.
4. M. Karimi, P. Krishnamurthy, J. Joshi and D. Tipper, "Mining Historical Data Towards Interference Management in Wireless SDNs," *Proceedings 13th ACM Symposium on QoS and Security for Wireless and Mobile Networks*, Miami, FL, Nov., 21-25, 2017.
5. R. Abhishek, S. Zhao, D. Tipper and D. Medhi, "SeSAmE: Software Defined Smart Home Alert Management System for Smart Communities," *Proceedings of IEEE International Symposium on Local and Metropolitan Area Networks*, Osaka, Japan, June 12-14, 2017.
6. R. Xu, J. Joshi, P. Krishnamurthy and D. Tipper, "Insider Threat Mitigation in Attribute Based Encryption," *Proceedings of 9th National Cyber Security Summit*, Huntsville, AL, June 6-8, 2017.
7. L. Martins, T. Gomes and D. Tipper, "An Efficient Heuristic for Calculating a Protected Path with Specified Nodes," *Proceedings 8th International Workshop on Reliable Networks Design and Modeling (RNDM 2016)*, Sweden, September 13-15, 2016.
8. A. Alashaikh, D. Tipper and T. Gomes, "Supporting Differentiated Resilience Classes in Multilayer Networks," *Proceedings 12th IEEE Design of Reliable Communication Networks (DRCN 2016)*, Paris, France, March 15-17, 2016.
9. X. Wang, P. Krishnamurthy, and D. Tipper, "A Collaborative Spectrum-Sharing Framework for LTE Virtualization," *Proceedings 2015 IEEE Conference on Collaboration and Internet Computing (CIC)*, Hangzhou, China, Oct. 27-30, 2015.
10. M. Levesque and D. Tipper, "Improving PTP Synchronization Accuracy Under Asymmetric Delay Conditions," *Proceedings of International IEEE Symposium on Precision Clock Synchronization for Measurement and Communication (ISPCS 2015)*, Beijing, China, Oct., 11-16, 2015.

11. T. Gomes, S. Marques, L. Martins, M. Pascoal and D. Tipper, "Protected Shortest Path Visiting Specified Nodes," *Proceedings 7th International Workshop on Reliable Networks Design and Modeling (RNDM 2015)*, Munich, Germany, October 5-7, 2015.
12. A. Abdel-Hamid, P. Krishnamurthy and D. Tipper, "Resource Scheduling for Heterogeneous Traffic in LTE Virtual Networks," *Proceedings 16th IEEE Conference on Mobile Data Management*, Pittsburgh, PA, June 15-18, 2015.
13. V. Kounev, D. Tipper, M. Levesque, B. Grainger, T. McDermott and G. Reed, "A Microgrid Co-simulation Framework," *Proceedings 2015 IEEE Workshop on Modeling and Simulation of Cyber-Physical Energy Systems (part of CPSWeek 2015)*, Seattle, WA, April 13-17, 2015.
14. V. Kounev, M. Levesque, D. Tipper and T. Gomes, "On Smart Grid Communications Reliability," *Proceedings 11th IEEE Design of Reliable Communication Networks (DRCN 2015)*, Kansas City, MO, March 25-27, 2015. (Best Paper Award Winner).
15. J. Silva, T. Gomes, D. Tipper, L. Martins, and V. Kounev "An Algorithm for Computing All-terminal Reliability Bounds," *Proceedings 6th International Workshop on Reliable Networks Design and Modeling (RNDM 2014)*, Barcelona, Spain, Nov. 17-19, 2014.
16. B. Grainger, G. Reed, T. McDermott, Z.-H. Mao, V. Kounev and D. Tipper, "Analysis of an Offshore Medium Voltage DC Microgrid Environment – Part I: Power Sharing Controller Design," *IEEE PES Transmission & Distribution Conference*, Chicago, IL., April, 14-17, 2014.
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Keynote Presentations

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Workshop and Conference Presentations and Posters

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2. K. Xu, D. Tipper, P. Krishnamurthy and Y. Qian, "A Framework of Efficient Hybrid Model and Optimal Control for Multihop Wireless Networks," refereed poster and two page abstract in proceedings, *ACM Sigmetrics/Performance 2012*, London, England, June 11-15, 2012.
3. Y. Liu, D. Tipper and Z. Sui, "Spare Capacity Sharing using Partially Disjoint Backup Paths for Dual Fiber-Cut Protection," *INFORMS Telecommunications Conference*, Boca Raton, FL, March, 14-16, 2012.
4. D. Tipper, P. Krishnamurthy, "A Mobile Information Systems Course," *Poster at NSF Engineering and Computing Education Grantee PI Meeting*, Washington, DC, Feb.16-18, 2005.
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6. A. Srikitja and D. Tipper, "Virtual Private Network Design for the Next Generation Internet," *MPLS World Congress*, Paris, France, Feb., 2001.
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12. D. Medhi and D. Tipper, "Configurable Survivable Multi-Networks: Cosmos," *DARPA/ITO Adaptive Architecture Workshop*, Palo Alto, CA May, 1998.
13. D. Tipper and D. Medhi, "Self Configuring Survivable Multi-Networks," *DARPA/ITO Network Management Workshop*, Princeton, NJ, Oct., 1997.
14. B. Jager and D. Tipper, "Priorities for Fault Recovery in ATM Networks," *12th IEEE Computer Communications Workshop*, Phoenix, AZ, Sept., 1997.
15. D. Tipper, "Wide Area ATM Traffic Measurements," invited talk at *1996 DARPA Workshop on Wide-Area ATM Performance*, University of Kansas, Lawrence, June 19-20, 1996.
16. D. Tipper, W. P. Wang, D. Medhi, and R. Cotter, "Fault Recovery Routing Strategies for ATM Networks," presented at *INFORMS Spring 1996 Meeting*, Washington, D. C., May, 1996.
17. A. Srikitja, M. Stover, T. Zhang, E. Zhong, S. Banerjee, D. Tipper, M. Weiss, and A. Khalil, "End-to-End Traffic Measurements on a Wide Area ATM Network," *Gigabit Networking Workshop GBN-96*, San Francisco, March, 1996.
18. D. Tipper, W. Wang, Y. Qian, X. Zhang, and K. Balakrishnan, "Performance Modeling of Transient Network Behavior," presented at *Gigabit Networks: Key to the Information Superhighway*, Clemson, SC, Nov., 1994.

19. D. Tipper, J. Hammond, S. Sharma, A. Khetan, K. Balakrishnan, and S. Menon, "A Numerical Analysis of the Effects of Link Failures in Wide Area Networks," presented at *4th International IEEE Workshop on Computer Aided Modeling, Analysis and Design of Communications Links and Networks*, Montebello, Canada, Sept. 29 - Oct. 2, 1992.
20. S. Pappu, D. Tipper, and G. Meempat, "Analysis of Buffer Management Space Priority Mechanisms for ATM Networks," presented at *Second ORSA Telecommunications Conference*, Boca Raton, FL, March, 1992.
21. D. Tipper, W. Lovegrove, and J. Hammond, "Buffer Allocation Strategies for Tandem Queues," presented at *TIMS/ORSA Joint National Meeting*, Nashville, Tennessee, May 12-15, 1991.
22. D. Tipper, W. P. Lyui, T. Y. Thiak, and S. Pingali, "Modeling the Nonstationary Behavior Window Flow Control in Data Networks," presented at *CORS/TIMS/ORSA Joint National Meeting*, Vancouver, Canada, May 8-10, 1989.
23. D. Tipper and M. K. Sundareshan, "Optimal Threshold Routing of Virtual Circuits in Data Networks," presented at *TIMS/ORSA Joint National Meeting*, Washington, D. C., April 25-27, 1988.

Have given over a dozen seminars on my research at corporate research centers (e.g., OCATE, AT&T Bell Labs, MITRE, GTE Labs, Motorola, Alcatel) and universities (e.g., CMU, Portland State, UC Davis, etc.).

BOOK REVIEWS

1. D. Tipper, "Control and Performance in Packet, Circuit and ATM Networks, by X. Gu, K. Sohrawy, and D. Vamen, Kluwer, 1995" *IEEE Communications Magazine*, Feb, 1996.

CONFERENCE REPORTS

1. Montgomery, W., Mc Quaide, C., Rak, J., Tipper, D., Walkowiak, K., Zivalj, D., Kalamujic, K., Xinwan Li, Yikai Su, Manzanarez-Lopez, P., Malgosa-Sanahuja, J., Vishnevsky, V., Samouylov, K., Koucheryavy, Y., Vinel, A., Tkachenko, D., "Global Communications Newsletter," *IEEE Communications Magazine*, Vol. 49., No. 3., March, 2011.

PATENTS

1. Y. Liu and D. Tipper, "Apparatus and Method for Spare Capacity Allocation," U.S. Patent 6,744,727 B2, June 1, 2004.

TEACHING EXPERIENCE

Courses Taught and Developed

University of Pittsburgh (four courses per academic year)

- Queueing Theory (graduate course) – developed course
- Network Performance (graduate course) – developed course
- Network Design (graduate course) – revised course
- Doctoral Seminar (graduate course)
- Foundations of Wireless Communications (graduate course)
- Introduction to Wireless Networks (undergraduate/graduate course) – co-developed course (funded by NSF ITR grant)
- Wireless Networks II – developed course (graduate course)
- Information System and Network Infrastructure Protection (graduate course) – developed course (funded by NSF Federal Cybersecurity grant)

- Cellular Radio and Personal Communication Systems (no longer offered) (graduate course) – developed course
- Telecommunications Seminar
- Mobile Application Development – developed course (funded by NSF CCLI grant)
- Wireless Communications (no longer offered) – developed course
- Communication Devices (no longer offered) (undergrad/grad course)
- Electronic Communications II (no longer offered) (graduate course)
- Modeling of Information Systems and Processes (no longer offered) (graduate course)
- Simulation Methodologies (no longer offered) (undergraduate course)
- Statistical Analysis of Data (no longer offered) (undergraduate course)

Clemson University (four courses per academic year)

- Advanced Topics in Communication Networks (graduate course)
- Control of Large Scale Systems (graduate course) – developed course
- Queueing Theory (graduate course)
- Simulation Modeling and Analysis (graduate course) – developed course
- Linear Systems Theory (graduate course)
- Control Systems (undergraduate course)
- Signals and Systems Analysis (undergraduate course)

Have taught a variety of short courses and tutorials related to my research and the university courses above at various colleges, universities, conferences and workshops. For example, David Tipper and Yi Qian, “Security and Dependability of Networked Information Systems,” Tutorial at IEEE ICC 2008, Beijing, China, 2:00 – 6:00 pm, May 19, 2008.

Student Advising

PhD Dissertations Supervised

1. Abdulaziz Alashaikh, “Supporting Differentiated Classes of Resilience in Multilayer Networks,” *PhD Telecommunications*, University of Pittsburgh, August, 2017.
2. Velin Kounev, “Secure Real-Time Smart Communications: A Microgrid Perspective,” *PhD Telecommunications*, University of Pittsburgh, August, 2015. Current Position: Member of Technical Staff, AT&T Labs, Bedminster, NJ.
3. Kunjie Xu, “Time Dependent Performance Analysis of Wireless Networks,” *PhD Telecommunications*, University of Pittsburgh, August, 2014. Current Position: System Engineer, Ericsson, San Jose, CA.
4. Saman T. Zargar, “Towards Coordinated Network-Wide Traffic Monitoring for Early Detection of DDoS Flooding Attacks,” (co-advisor with James Joshi), *PhD Telecommunications*, University of Pittsburgh, June, 2014. Current Position: Cybersecurity Engineer, Cisco. San Jose, CA.
5. Tae-Hoon Kim, “Cross Layer Resilience on Critical Points in Mobile Ad Hoc Networks,” *PhD Telecommunications*, University of Pittsburgh, December, 2010. Current Position: Assistant Professor, Department of Computer Information Technology, Purdue University, Calumet, IN.
6. Peera Pacharintanakul, “Crosslayer Survivability in Overlay-IP-WDM Networks,” *PhD Telecommunications*, University of Pittsburgh, August, 2010. Current Position: Network Designer, TOT Public Company Ltd, Bangkok, Thailand.
7. Siriluck Tipmongkonsilp, “Hybrid Modeling of the Dynamic Behavior of Mobile Ad-Hoc Networks,” *PhD Telecommunications*, University of Pittsburgh, August, 2009. Current Position: Senior Network Engineer, CAT Telecom, Bangkok, Thailand.

8. Saowaphak Sasanus, "Signaling Overload Control for Cellular Networks," *PhD Telecommunications*, University of Pittsburgh, December, 2008. Current Position: Senior Network Engineer, TOT Public Company Ltd, Bangkok, Thailand.
9. Korn Vajanapoom, "Risk-Based Survivable Network Design," *PhD Telecommunications*, University of Pittsburgh, August, 2008. Current Position: Senior Consultant, Engineering Consultant Division, Samart Comtech Co, Bangkok, Thailand.
10. Koonlachat Meesublak, "Network Design Under Demand Uncertainty," *PhD Telecommunications*, University of Pittsburgh, December, 2007. Current Position: Research Scientist, National Electronics and Computer Technology Center, Prathumthani, Thailand.
11. Xiaobing Hou, "Energy Conservation in Wireless Ad Hoc Routing," *PhD Telecommunications*, University of Pittsburgh, May, 2006. Current Position: Assistant Professor of Computer Science, Central Connecticut State University, New Britain, CT.
12. Hesham Bin-Abbas, "Adaptive Capacity Allocation in MPLS Networks," *PhD Electrical Engineering*, Dec. 2004. Current Position: Research Scientist KAIST, King Abdulaziz City for Science and Technology, Saudi Arabia.
13. Anotai Srikitja, "Topological Design of Multiple Virtual Private Networks Utilizing Sink Tree Paths," *PhD Telecommunications*, University of Pittsburgh, August, 2004. Current Position: Vice President Data Communications, CAT Telecom Public Company Ltd, Bangkok, Thailand.
14. Chutima Prommak, "Demand Based Network Planning for WLANs," *PhD Telecommunications*, University of Pittsburgh, May, 2004. Current Position: Assistant Professor, School of Telecommunications Engineering, Suranaree University of Technology, Nakhon Ratchasima, Thailand.
15. Chalernpol Charnsripinyo, "Design of Survivable Wireless Access Networks," *PhD Telecommunications*, University of Pittsburgh, Sept., 2003. Current Position: Research Director, National Electronics and Computer Technology Center, Prathumthani, Thailand.
16. Peerapon Siripongwutikorn, "Adaptive Bandwidth Control for Efficient Aggregate QoS Provisioning," *PhD Telecommunications*, University of Pittsburgh, Sept., 2003. Current Position: Associate Professor, Department of Computer Engineering, King Mongkut University of Technology, Thonburi, Thailand.
17. Yu Liu, "Spare Capacity Allocation: Model, Analysis and Algorithms," *PhD Telecommunications*, University of Pittsburgh, Dec. 2001. Current Position: Senior Research Engineer, Huawei Technologies, San Jose, CA.
18. Bjorn Jager, "Traffic Restoration in Survivable Wide Area Communication Networks," *PhD Informatics*, University of Bergen, Bergen, Norway (external-advisor), Sept., 2000. Current Position: Associate Professor, Department of Informatics, Molde College, Molde, Norway.
19. Adel Al-Rumaih, "A Spare Capacity Planning Methodology for Wide Area Survivable Networks," *PhD Information Science*, University of Pittsburgh, May, 1999. Current Position: Senior Computer Scientist, Saudi Arabian Supercomputer Center, King Abdulaziz City for Science and Technology, Saudi Arabia.
20. Yi Qian, "Analysis and Design of Dynamic Bandwidth Access Control Schemes for B-ISDN Communication Systems," (co-advisor with John Spragins) *PhD Electrical Engineering*, Clemson University, May, 1996. Current Position: Associate Professor ECE, University of Nebraska, Lincoln, NE.

Master's Theses Supervised

1. C. Ovon, "Models for Greenfield and Incremental Cellular Network Planning," *MS Telecommunications*, University of Pittsburgh, May, 2012.
2. H. Shin, "PCS Network Survivability," *MS Telecommunications*, University of Pittsburgh, Aug., 1999.
3. A. Srikitja, "Comparative Evaluation of CBR ATM Traffic Queuing Models", *MS Telecommunications*, University of Pittsburgh, June, 1997.
4. S. Ramaswamy, "A Framework for Survivability in Mobile Cellular and PCS," *MS Telecommunications*, University of Pittsburgh, June, 1997.
5. X. Zhang, "Numerical Methods for Nonstationary Communication Network Analysis," *MS Computer Engineering*, Clemson University, May, 1995.
6. W. Wang, "Fluid Flow Models for Analyzing the Nonstationary Behavior of High Speed Communication Networks," *MS Computer Engineering*, Clemson University, Aug., 1994.
7. H. Natarajan, "Buffer Management in ATM Networks," *MS Computer Engineering*, Clemson University, Aug., 1994.
8. R. Palazzo, "A Lyapunov Approach to Dynamic Bandwidth Allocation in B-ISDN," *MS Electrical Engineering*, Clemson University, Aug., 1994.
9. S. Suri, "A Comparative Analysis of Space Priority Strategies for ATM Networks," *MS Electrical Engineering*, Clemson University, Aug., 1993.
10. J. George, "Hardware Implementation of a Pushout Scheme for ATM Output Buffer Management," *MS Computer Engineering*, Clemson University, May, 1993.
11. K. Balakrishnan, "An Analysis of Routing Strategies for Traffic Restoration in Wide Area Communication Networks," *MS Computer Engineering*, Clemson University, Dec., 1992.
12. S. Sharma, "Approximate Models of Nonstationary Queues and Their Application to Communication Networks," *MS Electrical Engineering*, Clemson University, Dec., 1992.
13. S. Sokhi, "Nonstationary Analysis of Prioritized Polling With Bursty Traffic," *MS Electrical Engineering*, Clemson University, Dec., 1992.
14. S. Pappu, "Analysis of Space Priority Buffer Management Mechanisms in Broadband ISDNs," *MS Electrical Engineering*, Clemson University, May, 1992.
15. A. Mahapatra, "Analysis of Output Buffer Management Strategies in Broadband Integrated Services Digital Networks," *MS Electrical Engineering*, Clemson University, May, 1992.
16. S. Pingali, "Adaptive Window Flow Control in ISDN Frame Relay Networks," *MS Electrical Engineering*, Clemson University, Dec., 1989.

SERVICE

University, School/College and Department/Program Committees

University of Pittsburgh

- School of Information Science (SIS) Council, 9/08 - present
- Chair Faculty Search Committee, 2008 - 2009
- University Research Council, 7/00- 8/04

University wide, provost level, committee to foster research, set strategic research directions for the university, administer internal Pitt grant program, review patent and copyright policies, sponsors annual science/technology fair, etc.

- University Senate Community Relations Committee, 7/96 – 7/98

University wide faculty senate committee to facilitate relations between the university and the local public and government – met with community organizers/ leaders, mayor, city council, etc.

- University Faculty Senate (Senate Council) 7/97 – 6/99
- SIS Faculty Search Committee (three faculty positions), 2002-2003

- SIS Planning and Budget Committee, 7/99 – 6/01, 7/05-6/06
- Chair Faculty Search Committee, Spring 1998
- Telecommunications Program Committee, 7/94 – present

Clemson University

- ECE Department Strategic Planning Committee, 1993-1994
- Chair, Computer Communications Focus Area Committee, 1989-1993
- Undergraduate Curriculum Committee, 1991-1993
- Faculty Search Committee, 1989-1992

Professional Service

Editorial Activities

- Co-Guest Editor (with D. Schupke and O. Gonzalez De Dios), Special Issue on Advances in Network Planning, (two parts) in *IEEE Communications Magazine*, Vol. 52, No. 1, and No. 2, 2014.
- Co-Guest Editor (with J. Rak, and K. Walkowiak), Special Issue on “Reliable Networks Design and Modeling,” *Telecommunication Systems*, Vol. 52, No. 2, February, 2013.
- Co-Guest Editor (with D. Medhi, J. Doucette), Special Section “Design of Reliable Communication Networks (Best Papers from DRCN 2009),” *Computer Communication*, Vol. 34, No. 12, August 2, 2011.
- Member Editorial Board: *Journal of Network and Systems Management*, Jan. 2000 – Dec., 2005.
- Co-Guest Editor (with W. Grover), Special Issue on “Designing and Managing Optical Networks and Services for High Reliability,” *Journal of Network and Systems Management*, Vol. 13, No. 1, March, 2005.
- Co-Guest Editor (with D. Medhi), Special Issue on “Fault Management in Communication Networks,” *Journal of Network and Systems Management*, Vol. 5, No. 2, June, 1997.

Organizational Activities (partial list)

- Steering Committee, *IEEE Design of Reliable Communications Networks* (DRCN), (2003 – present).
- Symposium Chair, Network Algorithms and Performance Evaluation, IEEE International Conference on Computing Networking and Communications (ICNC), Honolulu, Hawaii, Feb. 3-6, 2014
- Tutorials Chair, 25th International Teletraffic Congress (ITC), Shanghai, China, Sept. 10-12, 2013
- General Chair, *Seventh International IEEE Design of Reliable Communication Networks Workshop* (DRCN), Washington, D. C., Oct., 2009.
- General Chair, *IEEE Workshop on Information Assurance* (WIA07, WIA06, WIA04) in conjunction with the *IEEE International Performance Computing and Communications Conference (IPCCC)*, New Orleans, April, 2007; Phoenix, AZ, April, 2006; Phoenix, AZ, April, 2004.
- Organizer and Moderator of Panel Session, “Providing Information Assurance in Next Generation Networked Information Systems,” *IEEE International Performance Computing and Communications Conference (IPCCC)*, Phoenix, AZ, April, 2006.
- Organizer and Moderator of Panel Session, “Reliable Networks for Reliable Services,” *Fifth IEEE International Workshop on the Design of Reliable Communication Networks (DRCN 2005)*, Oct. 17-19, 2005, Ischia, Italy.
- Technical Program Chair, *Fourth International IEEE Design of Reliable Communication Networks (DRCN) Workshop*, Banff, Canada, Oct., 2003.

- Executive Committee Member, *IEEE INFOCOM Conference 1997* (Chair of Panels: selected panel topics and identified panel moderators and organizers).
- Session Organizer, *12th IEEE Computer Communications Workshop*, Phoenix, AZ, 1997.
- Organizer and Moderator of Panel Session, “Simulation Modeling of High Speed Networks: State of the Art and Challenges,” *IEEE INFOCOM 1996*, San Francisco, CA.
- Session Organizer and Session Chair, *1996 IEEE Workshop on Computer-Aided Modeling, Analysis and Design of Communication Links*, Washington, DC.

Technical Program Committee Memberships

Have participated as a TPC member in over 60 conferences – a partial list is below

- *IEEE International Conference on Smart Grid Communications (SmartGridComm) 2012-2015*
- *IEEE International Conference on Computing Networking and Communications (ICNC) 2011-2014*
- *International Teletraffic Congress (ITC) 2009-2014*
- *IEEE International Workshop on Reliable Networks Design and Modeling (RNDM) 2009 - 2017*
- *ACM/IEEE International Workshop on Modeling Analysis and Simulation of Wireless and Mobile Systems (MSWiM) 2002-2008*
- *IEEE Symposium on Computers and Communications (ISCC) 2005-2011*
- *IEEE International Performance Computing and Communications Conference (IPCCC) 2005-2010*
- *IEEE Next Generation Internet Conference (NGI) 2007-2011*
- *ACM International Workshop on Mobility Management and Wireless Access Protocols (MobiWac) 2004 – 2006*
- *IEEE INFOCOM Conference, 1990, 1992-1998, 2003*

Reviewer (partial list)

- Most of the major journals in my research area: *IEEE Transactions on Networking*, *IEEE Communication Magazine*, *Operations Research*, *IEEE Journal on Selected Areas in Communications*, *IEEE Transactions on Reliability*, *Computer Networks*, *ACM Computer Communication Review*, *IEEE Transactions on Dependability and Security*, *Telecommunication Systems*, *IEEE Transactions on Smart Grid*, *Computer Communications*
- Numerous conferences: *ICC*, *INFOCOM*, *Globecom*, *Collaboratecom*
- Book publishers: *Addison Wesley* and *John Wiley*
- Various funding agencies: *National Science Foundation*, *State of Missouri Research Board*, *Norwegian Research Council*, *National Sciences and Engineering Research Council of Canada*, *Alberta Ingenuity Fund*.

PROFESSIONAL ORGANIZATIONS

- Senior Member of IEEE
- Member of Sigma Xi