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## **PROFESSIONAL EXPERIENCE**

- Professor, August 2014 - Present  
Phillip M. Drayer Department of Electrical Engineering  
Lamar University  
Beaumont, Texas 77710 USA
- Associate Professor, July 2007 – June 2014  
Phillip M. Drayer Department of Electrical Engineering  
Lamar University  
Beaumont, Texas 77710 USA
- Assistant Professor, June 2002 - June 2007  
Phillip M. Drayer Department of Electrical Engineering  
Lamar University  
Beaumont, Texas 77710 USA

## **AREAS OF EXPERTISES AND RESEARCH INTERESTS**

- Computer Networks and Security
- Cyber-Physical Systems and Cybersecurity
- Satellite/Space Networks and Deep-Space Communications
- Delay-/Disruption-Tolerant Networks (DTN)
- Intermittent-Connectivity Networks
- Wireless and Ad Hoc Networks

## **HIGHEST DEGREE EARNED**

- Ph.D. in Electrical/Computer Engineering** August 2001
- New Mexico State University, Las Cruces, New Mexico, USA
  - Advisor: Dr. Stephen Horan (Currently a Principal Investigator at NASA Langley Research Center)

## **HIGHLIGHT OF PROFESSIONAL ACTIVITIES**

- (1) Associate Editor, *IEEE Transactions on Aerospace & Electronics Systems*, 2018-Present
- (2) Associate Editor, *IEEE Aerospace & Electronics Systems Magazine*, January 2012-Present
- (3) Member, The Teaching Board of PhD Program in Science and Technology for Electronic and Telecommunication (STIET), University of Genova, Italy, 2018-Present
- (4) Named as “**Best Associate Editor**” of *IEEE Aerospace & Electronics Systems Magazine*, 2015
- (5) Associate Editor, *Wiley InterScience’s Wireless Communications and Mobile Computing Journal*, Aug.

2006-2010

- (6) Guest Editor, *IEEE Aerospace & Electronics Systems Magazine* Special Issue on “Recent Trends in Interplanetary Communications Systems”, 2010.
- (7) Associate Editor, *Journal of Computer Systems, Networks, and Communications (JCSNC)*, July 2007-July 2011.
- (8) Associate Editor, *Wiley’s Journal of Security and Communication Networks*, July 2007-July 2011.
- (9) TPC co-chair, *IEEE International Conference on Communications (ICC) 2007 Wireless Communications Symposium*, the flagship conference of *IEEE Communications Society*.

## **RESEARCH WORK**

### **Selected Publications and Tutorials Given**

#### Book Chapters and Tutorials

- (1) **R. Wang**, X. Wu, T. Wang, and T. Taleb, “Delay Tolerant Networking (DTN) Protocols for Space Communications,” in *Delay Tolerant Networks: Protocols and Applications*, Auerbach Publications, CRC Press, November 2011.
- (2) Z. Zhang and **R. Wang**, “Disruption/Delay Tolerant Mobile Tactical Ad Hoc Networks: Overview and Challenges,” Tutorial at IEEE Military Communications Conference (IEEE MILCOM 2010), Oct.-Nov., 2010.
- (3) Z. Zhang and **R. Wang**, “Tutorial: Disruption-/Delay-Tolerant Networking (DTN) for Ad Hoc and Space Networks,” *IEEE International Conference on Communications (ICC)*, Kyoto, Japan, June 2011.

#### Peer-reviewed Journal/Magazine Papers Published

- (1) S. Horan and **R. Wang**, “Design of a space channel simulator using virtual instruments software,” *IEEE Transactions on Instrumentation and Measurement*, vol. 51. No. 5, October 2002, pp. 912-916 (<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=1174016&isnumber=26372>)
- (2) **R. Wang** and S. Horan, “The Impact of Van Jacobson Header Compression on TCP/IP throughput performance over lossy space channels,” *IEEE Transactions on Aerospace and Electronic Systems (TAES)*, vol. 41, No. 2, April 2005, pp. 681-692. (<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=1468757&isnumber=31509>)
- (3) Rufa Wang and **R. Wang**, “Experimental study of channel delay impact on throughput performance of TCP and its extensions in space,” *Journal of Zhejiang University SCIENCE*, vol. 6A, No. 10, October 2005, pp. 1015-1020.
- (4) **R. Wang**, B. Gutha, S. Horan, Y. Xiao, and Bo Sun, “Which transmission mechanism is best for space Internet: window-based, rate-based, or a hybrid of the two?” *IEEE Wireless Communications*, vol. 12, No. 6, December 2005, pp. 42-49. (<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=1561944&isnumber=33163>)
- (5) **R. Wang**, “Data transport protocols for space Internet,” *Perspective Article of IEEE Satellite and Space Communications (SSC) Newsletter*, vol. 16, No. 1, June 2006 (invited).
- (6) **R. Wang**, S. Horan, and B. Tian, “Optimal acknowledgement frequency for maximum throughput over asymmetric space-Internet links,” *IEEE Transactions on Aerospace and Electronic Systems*, vol. 42, No. 4, October 2006, pp. 1311-1322. (<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=4108003&isnumber=4107974>)
- (7) **R. Wang**, S. Horan, and R. Chandrasekaran, “An experimental investigation of cross-layer optimal packet size in space Internet,” **special issue** on cross-layer protocols for satellite communication network of *International Journal of Satellite Communications and Networking*, vol. 24, November 2006, pp. 561-577. (<http://onlinelibrary.wiley.com/doi/10.1002/sat.859/abstract>)
- (8) Y. Xiao, H. Chen, B. Sun, **R. Wang**, and S. Sethi, “MAC security and security overhead analysis in the IEEE 802.15.4 wireless sensor networks,” **special issue** on wireless network security of *EURASIP Journal on Wireless Communications and Networking*, vol. 2006, No.2, April 2006, pp.81-95. (<http://downloads.hindawi.com/journals/wcn/2006/093830.pdf>)
- (9) B. Sun, K. Wu, Y. Xiao, and **R. Wang**, “Integration of mobility and intrusion detection for wireless Ad Hoc networks,” (*Wiley*) *International Journal of Communication Systems*, vol. 20, Issue 6, June 2007, pp. 695-721.

- (<http://onlinelibrary.wiley.com/doi/10.1002/dac.853/abstract>)
- (10) G. Giambene, B. Yeo, and **R. Wang**, “Guest Editorial: Special issue on ‘Cross-Layer Design for QoS Support in Wireless and Hybrid Networks’,” Special issue on Cross-Layer Design for QoS Support in Wireless and Hybrid Networks of *Journal of Communications Software and Systems (JCOMSS)*, vol. 3, No. 3, September 2007, pp. 145-147.
  - (11) B. Sun, Y. Xiao, and **R. Wang**, “Detection of fraudulent usage in wireless networks,” *IEEE Transactions on Vehicular Technology*, vol. 56, No.6, Nov. 2007, pp. 3912 - 3923.  
([http://ieeexplore.ieee.org/xpl/freeabs\\_all.jsp?arnumber=4356991](http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=4356991))
  - (12) **R. Wang**, B. Gutha, and Paradesh Kumar Rapet, “Window-based and rate-based transmission control mechanisms over space-Internet links,” *IEEE Transactions on Aerospace and Electronic Systems*, vol. 44, No. 1, January 2008, pp. 157-170.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=04516996>)
  - (13) **R. Wang** and S. Guizani, “A comparative investigation of acknowledgment mechanisms for data transport in space Internet,” *IEEE Wireless Communications*, vol.15, No. 1, February 2008, pp. 82-91.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=4454708&isnumber=4454693>)
  - (14) **R. Wang** and S. Horan, “Protocol testing of SCPS-TP over NASA’s ACTS asymmetric links,” *IEEE Transactions on Aerospace and Electronic Systems*, vol. 45, No. 2, April 2009, pp. 790-798.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5089562&isnumber=5089526>)
  - (15) **R. Wang**, T. Taleb, A. Jamalipour, and B. Sun, “Protocols for reliable data transport in space Internet,” *IEEE Communications Surveys and Tutorials*, vol. 11, No. 2, Second Quarter 2009, pp. 21-32. (Nominated for 2009 IEEE Communications Society Best Tutorial Paper)  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5039581>)
  - (16) **R. Wang**, B. Shrestha, X. Wu, T. Wang, A. Ayyagari, E. Tade, S. Horan, and J. Hou, “Unreliable CCSDS File Delivery Protocol (CFDP) over cislunar communication links,” *IEEE Transactions on Aerospace and Electronic Systems*, vol. 46, No. 1, January 2010, pp. 147-169.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5417153>)
  - (17) **R. Wang**, X. Wu, T. Wang, X. Liu, and L. Zhou, “TCP Convergence Layer-based operation of DTN for long-delay cislunar communications,” *IEEE Systems Journal*, vol. 4, No. 3, September 2010, pp. 385-395.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5483142>)
  - (18) **R. Wang**, X. Wu, Q. Zhang, T. Taleb, Z. Zhang, and J. Hou, “Experimental evaluation of TCP-based DTN for cislunar communications in presence of long link disruption,” **special issue** on opportunistic and delay tolerant networks of *EURASIP Journal on Wireless Communications and Networking*, January 2011.  
(<http://downloads.hindawi.com/journals/wcn/2011/720671.pdf>)
  - (19) M. De Sanctis **R. Wang**, G. Araniti, S. Burleigh, and I. Bisio, “Recent Advances in Interplanetary Communications – An Introduction,” Special issue on Recent Trends in Interplanetary Communications Systems of *IEEE Aerospace & Electronics Systems Magazine*, vol. 26, No. 2, February 2011, p. 4.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5739482>)
  - (20) **R. Wang**, S. Burleigh, P. Parik, C-J Lin, and B. Sun, “Licklider Transmission Protocol (LTP)-based DTN for cislunar communications,” *IEEE/ACM Transactions on Networking*, vol. 19, No. 2, April 2011, pp. 359-368.  
([http://ieeexplore.ieee.org/xpl/freeabs\\_all.jsp?arnumber=5671516](http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=5671516))
  - (21) **R. Wang**, Z. Wei, V. Dave, B. Ren, Q. Zhang, J. Hou, and L. Zhou, “Which DTN CLP is best for long-delay cislunar communications with channel-rate asymmetry?,” *IEEE Wireless Communications*, vol. 18, No. 6, December 2011, pp. 10-16.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6108327>)
  - (22) Q. Yu, **R. Wang**, Z. Wei, X. Sun, and J. Hou, “DTN Licklider Transmission Protocol (LTP) over Asymmetric Space Channels,” *IEEE Aerospace and Electronic Systems Magazine*, vol. 28, No. 5, May 2013, pp. 14-22.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6516145>)
  - (23) X. Sun, Q. Yu, **R. Wang**, Q. Zhang, Z. Wei, J. Hu, and A. Vasilakos, “Performance of DTN Protocols in Space Communications,” *ACM/Springer Wireless Networks (WINET)*, vol. 19, No. 8, November 2013, pp. 2029-2047 (DOI 10.1007/s11276-013-0582-0).  
(<http://www.springerlink.com/openurl.asp?genre=article&id=doi:10.1007/s11276-013-0582-0>)
  - (24) **R. Wang**, Z. Wei, Q. Zhang, and J. Hou, “LTP Aggregation of DTN Bundles in Space Communications,”

- IEEE Transactions on Aerospace and Electronic Systems*, vol. 49, No. 3, July 2013, pp.1677-1691.  
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- (25) J. Hu, **R. Wang**, Q. Zhang, Z. Wei, and Jia Hou, "Aggregation of DTN Bundles for Space Internetworking System," *IEEE Systems Journal*, vol. 7, No. 4, December 2013, pp. 658-668.  
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6423201>)
- (26) Q. Yu, X. Sun, **R. Wang**, Q. Zhang, J. Hu, and Z. Wei, "The effect of DTN custody transfer in deep-space communications", *IEEE Wireless Communications*, vol. 20, No. 5, October 2013, pp.169-176.  
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6664488>)
- (27) J. Hu, **R. Wang**, X. Sun, Q. Yu, Z. Yang, and Q. Zhang, "Memory dynamics for DTN protocol in deep-space communications", *IEEE Aerospace and Electronic Systems Magazine*, vol. 29, No. 2, February 2014, pp.22-30 (Published as a front cover paper).  
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6778537>)
- (28) Z. Yang, **R. Wang**, Q. Yu, X. Sun, M. De Sanctis, Q. Zhang, J. Hu, and K. Zhao "Analytical characterization of Licklider transmission protocol (LTP) in cislunar communications", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 50, No. 3, July 2014, pp. 2019-2031.  
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6965754>)
- (29) Zhihua Yang, Qinyu Zhang, **R. Wang**, Hongbing Li, and A. Vasilakos, "On storage dynamics of space delay/disruption tolerant network node," *ACM/Springer Wireless Networks (WINET)*, Volume 20, Issue 8, August 2014, pp. 2529-2541.  
<http://www.springer.com/home?SGWID=0-0-1003-0-0&qId=2684097&download=1&checkval=377dc492dabd7fd1ff397ae1aed199d2>)
- (30) Z. Yang, H. Li, J. Jiao, Q. Zhang, and **R. Wang**, "CFDP-based two-hop relaying protocol over weather-dependent Ka-band space channel," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 51, No. 2, April 2015, pp. 1357-1374.  
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7126189>)
- (31) C. Feng, **R. Wang**, Z. Bian, T. Doiron, and J. Hu, "Memory Dynamics and Transmission Performance of Bundle Protocol (BP) in Deep-Space Communications," *IEEE Transactions on Wireless Communications*, vol. 14, No. 5, May 2015, pp. 2802-2813. [Online]. Available:  
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- (32) Q. Yu, S. Burleigh, **R. Wang**, and K. Zhao, "Performance Modeling of LTP in Deep-Space Communications," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 51, No. 3, July 2015, pp. 1609-1620.  
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- (33) K. Zhao, **R. Wang**, S. Burleigh, M. Qiu, A. Sabbagh, and J. Hu, "Modeling Memory Variation Dynamics for the Licklider Transmission Protocol in Deep-Space Communications," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 51, No. 4, October 2015, pp. 2510-2524.  
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7376198>)
- (34) M. Qiu, **R. Wang**, K. Zhao, W. Li, and D. Bian, "RTO Timer for Best Transmission Efficiency of Bundle Protocol in Deep-Space Communications", *IEEE Aerospace and Electronic Systems Magazine*, vol. 31, No. 1, January 2016, pp. 14-21 (Appeared as a front cover paper).  
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7395405>)
- (35) Q. Yu, **R. Wang**, K. Zhao, W. Li, X. Sun, J. Hu, and X. Ji, "Modeling RTT for DTN Protocols over Asymmetric Cislunar Space Channels," *IEEE Systems Journal*, vol. 10, No. 2, June 2016, pp. 556-567 (DOI: 10.1109/JSYST.2014.2330422).  
<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6861934>)
- (36) Z. Bian, **R. Wang**, K. Zhao, D. Bian, Z. Xie, and Y. Qian, "Bundle Protocol for Data Delivery over Highly Asymmetric Deep-Space Channels," *IEEE Networks*, vol. 30, No. 5, Sept./Oct. 2016, pp. 68-73.  
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7579029>)
- (37) K. Zhao, **R. Wang**, Scott C. Burleigh, Alaa Sabbagh, Wenwei Wu, and Mauro De Sanctis, "Performance of Bundle Protocol for Deep-Space Communications," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 52, No. 5, October 2016, pp. 2347-2361.  
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- (38) G. Wang, S. Burleigh, **R. Wang**, L. Shi, and Y. Qian, "Scoping Contact Graph Routing Scalability," *IEEE Vehicular Technology Magazine*, vol. 11, No. 4, December 2016, pp. 46-52.  
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- (39) **R. Wang**, M. Qiu, K. Zhao, and Y. Qian, "Optimal RTO Timer for Best Transmission Efficiency of DTN Protocol in Deep-Space Vehicle Communications," *IEEE Transactions on Vehicular Technology*, vol. 66, No. 3, March 2017, pp. 2536-2550.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7478130>)
- (40) A. Sabbagh, **R. Wang**, K. Zhao, and D. Bian, "Bundle Protocol over Highly Asymmetric Deep-Space Channels," *IEEE Transactions on Wireless Communications*, vol. 16, No. 4, April 2017, pp. 2478-2489.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7876871>)
- (41) L. Shi, J. Jiao, A. Sabbagh, **R. Wang**, Q. Yu, J. Hu, H. Wang, S. Burleigh, and K. Zhao, "Integration of Reed-Solomon Codes to Licklider Transmission Protocol (LTP) for Space DTN," *IEEE Aerospace and Electronic Systems Magazine*, vol. 32, No. 4, April 2017, pp. 48-55.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7938263>)
- (42) J. Jiao, **R. Wang**, S. Burleigh, Q. Xie, A. Zhuang, A. Sabbagh, and K. Zhao, "Reliable Deep-Space File Transfers – How Data Transfer Can Be Ensured Within a Single Round-Trip Interval?," *IEEE Vehicular Technology Magazine*, vol. 12, No. 4, December 2017, pp. 86-94.  
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8077760>)
- (43) A. Sabbagh, **R. Wang**, S. Burleigh, and K. Zhao, "Analytical Framework for Effect of Link Disruption on Bundle Protocol in Deep-Space Communications," *IEEE Journal on Selected Areas in Communications* special issue on Advances in Satellite Communications, vol. 36, No. 5, May 2018, pp. 1086-1096.  
(<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8353866>)
- (44) **R. Wang**, A. Sabbagh, S. Burleigh, M. Javed, S. Gu, J. Jiao, and Q. Zhang, "Modeling Disruption Tolerance Mechanisms for a Heterogeneous 5G Network," *IEEE Access* special section on New Waveform Design and Air-Interface for Future Heterogeneous Networks toward 5G, vol. 6, May 2018, pp. 25836-25848.  
(<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8357524>)
- (45) G. Yang, **R. Wang**, A. Sabbagh, K. Zhao, and X. Zhang, "Modeling Optimal Retransmission Timeout Interval for Bundle Protocol," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 54, No. 5, October 2018, pp. 2493-2508.  
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- (46) **R. Wang**, A. Sabbagh, S. Burleigh, K. Zhao, and Y. Qian, "Proactive Retransmission in Delay-/Disruption-tolerant Networking for Reliable Deep-Space Vehicle Communications," *IEEE Transactions on Vehicular Technology*, vol. 67, No. 10, October 2018, pp. 9983-9994.  
(<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8429110>)
- (47) G. Yang, **R. Wang**, K. Zhao, X. Zhang, W. Li, and X. He, "Queueing Analysis of DTN Protocol in Deep-Space Communications," *IEEE Aerospace and Electronic Systems Magazine*, vol. 33, No. 12, December 2018, pp. 40-48. (Appeared as a cover paper).  
(<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8650570>)
- (48) G. Yang, **R. Wang**, S. Burleigh, and K. Zhao, "Analysis of Licklider Transmission Protocol (LTP) for Reliable File Delivery in Space Vehicle Communications with Random Link Interruptions," *IEEE Transactions on Vehicular Technology*, vol. 68, No. 4, April 2019, pp. 3919-3932.  
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- (49) S. Gong, H. Shen, K. Zhao, W. Li, H. Zhou, **R. Wang**, Z. Sun, and X. Zhang, "Towards Optimized Network Capacity in Emerging Integrated Terrestrial-Satellite Networks," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 56, No. 1, February 2020, pp. 263-275.  
(<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8709736>)
- (50) Q. Wu, H. Liu, **R. Wang**, P. Fan, Q. Fan, and Z. Li, "Delay Sensitive Task Offloading in the 802.11p Based Vehicular Fog Computing Systems," *IEEE Internet of Things*, vol. 7, No. 1, January 2020, pp. 773-785.  
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- (51) S. Gong, H. Shen, K. Zhao, **R. Wang**, X. Zhang, T. De Cola, and J. Fraire, "Network Availability Maximization for Free-Space Optical Satellite Communications," *IEEE Wireless Communications Letters*, vol. 9, No. 3, March 2020, pp. 411-415.  
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- (52) Z. Shi, S. Peng, Y. Zhou, L. Yang, **R. Wang**, H. Hu, and K. Zhao, "Study on Checkpoint Timer Optimal Setup of Licklider Transmission Protocol (LTP)," *IEEE Aerospace and Electronic Systems Magazine*, vol. 35, No. 5, May 2020, pp. 4-13.  
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- (53) Y. Zhou, S. Burleigh, **R. Wang**, and K. Zhao, "A Study of Cross-Layer BP/LTP Data Block Size in Space Vehicle Communications over Lossy and Highly Asymmetric Channels," *IEEE Transactions on Vehicular Technology* (under review).

Peer-reviewed Conference Papers Published (incomplete list)

- (54) S. Horan and **R. Wang**, "Performance Comparison Using SCPS-FP and TCP/IP FTP over a Simulated Satellite Channel," In *Proceedings of International Telemetry Conference*, Vol.35, October 1999.
- (55) S. Horan and **R. Wang**, "Effects of Networking Configurations on Channel Throughput in Space," In *Proceedings of 14th AIAA Conference on Small Satellites*, August 2000.
- (56) S. Horan and **R. Wang**, "Internet-Type Protocol Testing in a Simulated Small Satellite Environment," In *Proceedings of IEEE Conference on Aerospace and Electronic Systems*, March 2001.
- (57) **R. Wang** and S. Bonasu, "Analysis of optimal ACK frequency over asymmetric GEO-Space Links," In *Proceedings of IEEE GLOBECOM 2004*, Dallas, TX, 2004.
- (58) **R. Wang**, "Channel delay impact on TCP and SCPS-TP over LEO/GEO-Stationary Space Links," In *Proceedings of IEEE 13<sup>th</sup> International Conference on Computer Communications and Networks (ICCCN)*, Chicago, IL, 2004.
- (59) **R. Wang**, S. Bonasu and S. Bagasrawala, "The Impact of TCP/IP header compression on performance over satellite links," In *Proceedings of IEEE Wireless Communication and Network Conference (WCNC)*, Atlanta, GA, 2004.
- (60) **R. Wang**, B. Gutha and R. Chandrasekaran, "Behavior of Vegas congestion control over satellite channels," In *Proceedings of IEEE Wireless Communication and Network Conference (WCNC)*, Atlanta, GA, 2004.
- (61) **R. Wang**, "An Experimental study of TCP/IP header compression behavior over satellite links," In *Proceedings of IEEE 60<sup>th</sup> Vehicular Technology Conference (VTC)*, Los Angeles, CA, 2004.
- (62) **R. Wang** and S. Bonasu, "Optimal acknowledgement frequency for enhanced throughput over asymmetric Geo-stationary satellite links," In *Proceedings of IEEE 60<sup>th</sup> Vehicular Technology Conference (VTC)*, Los Angeles, CA, 2004.
- (63) **R. Wang**, "A novel acknowledgment scheme for space Internet," In *Proceedings of IEEE 60<sup>th</sup> Vehicular Technology Conference (VTC)*, Los Angeles, CA, 2004.
- (64) **R. Wang**, V. Bandekodige and M. Banerjee, "An Experimental Study of Channel Delay Effects on Throughput Performance of TCP and its Extensions in Space," In *Proceedings of IEEE 60<sup>th</sup> Vehicular Technology Conference (VTC)*, Los Angeles, CA, 2004.
- (65) **R. Wang**, S. Singh, S. Bonasu and G. Fan, "An experimental evaluation of a novel acknowledgment scheme over GEO-satellite links," In *Proc. of IEEE Wireless Communication and Network Conference (WCNC)*, New Orleans, March 2005.
- (66) **R. Wang** and S. Horan, "Performance evaluation of TCP and its extensions over lossy links in a small satellite environment," In *Proc. of IEEE International Conference on Communications (ICC)*, Seoul, Korea, May 2005.
- (67) **R. Wang**, S. Horan, B. Gutha, Bo Sun, and P. Reguri, "An experimental analysis of rate-based and window-based transmission mechanisms over simulated space-Internet links," In *Proc. of IEEE GLOBECOM 2005*, St. Louis, MS.
- (68) **R. Wang** and S. Horan, "Performance of Space Communication Protocol Standards (SCPS) over ACTS satellite links," In *Proc. of IEEE GLOBECOM 2005*, St. Louis, MS.
- (69) **R. Wang**, B. Tian, B. Sun, Y. Xiao, and S. Guizani "Configurable Acknowledgment Delay (CAD) mechanism for asymmetric space-Internet Links," *IEEE GLOBECOM 2006*, San Francisco, CA, November 2006.
- (70) B. Sun, X. Jing, Y. Xiao, and **R. Wang**, "Enhancing security using mobility profile for cellular mobile networks," *IEEE GLOBECOM 2006*, San Francisco, CA, November 2006.
- (71) B. Sun, Z. Chen, **R. Wang**, F. Yu, and V.C.M. Leung, "Towards Adaptive Anomaly Detection in Cellular Mobile Networks", *IEEE Consumer Communications and Networking Conference (CCNC'06)*, Las Vegas, 2006, pp. 666-670.
- (72) **R. Wang** and S. Horan, "Performance evaluation of space communication protocol standards (SCPS) over asymmetric ACTS satellite links," *IEEE GLOBECOM 2006*, San Francisco, CA, November 2006.
- (73) **R. Wang**, S. Horan, S. Kota, and B. Sun, "An experimental evaluation of SCPS-TP over lossy GEO-space links," *IEEE GLOBECOM 2006*, San Francisco, CA, November 2006.
- (74) Y. Xiao, B. Sun, H. Chen, S. Guizani, and **R. Wang**, "Performance Analysis of Advanced Encryption

- Standards (AES),” *IEEE GLOBECOM 2006*, San Francisco, CA, November 2006.
- (75) B. Sun, Y. Xiao, **R. Wang**, and S. Guizani, “Enhancing security using calling activity for wireless networks,” *IEEE GLOBECOM 2006*, San Francisco, CA, November 2006.
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  - (83) Y. Han, X. Wang, Y. Xu, and **R. Wang**, “APS-FeW: the Second Order Enhancement for TCP over Multihop 802.11 Networks,” *IEEE GLOBECOM 2007*, Washington D.C., November 2007.
  - (84) X. Wang, C. Zhuo, Y. Xu, and **R. Wang**, “A New Stochastic Admission Control Scheme for Wireless Networks,” *IEEE GLOBECOM 2007*, Washington D.C., November 2007.
  - (85) **R. Wang**, B. L. Shrestha, X. Wu, E. Tade, T. Wang, and X. Wang, “Experimental Investigation of CCSDS File Delivery Protocol (CFDP) over Cislunar Communications Links with Intermittent Connectivity,” In *Proceedings of IEEE International Conference on Communications (ICC)*, May 2008.
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  - (87) T. Taleb, Z. M. Fadlullah, T. Takahashi, **R. Wang**, Y. Nemoto, and N. Kato, “Tailoring ELB for multi-layered satellite networks,” In *Proc. of IEEE International Conference on Communications (ICC)*, May 2009.
  - (88) **R. Wang**, X. Wu, T. Wang, and T. Taleb, “Experimental evaluation of Delay Tolerant Networking (DTN) protocols for long-delayed cislunar communications,” In *Proc. of IEEE GLOBECOM 2009*, Nov.-Dec., 2009.
  - (89) **R. Wang**, T. Wang and X. Wu, “Bundle Protocol (BP) over Licklider Transmission Protocol (LTP) for cislunar communications,” In *Proc. of IEEE GLOBECOM 2009*, Nov.-Dec., 2009.
  - (90) **R. Wang**, X. Wu, L. Zhou, and J. Hou, “TCP convergence layer (TCPCL)-based DTN over Cislunar Channels in Presence of long link disruption,” In *Proc. of IEEE GLOBECOM 2010*, Nov.-Dec., 2010.
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  - (92) **R. Wang**, V. Dave, B. Ren, R. Bhavanthula, Q. Zhang, J. Hou, and L. Zhou, “Interplanetary Overlay Network (ION) for Long-delay Communications with Asymmetric Channel Rates,” In *Proc. of IEEE International Conference on Communications (ICC)*, June 2011.
  - (93) Y. Wang, L. Zhou, and **R. Wang**, “A Frequency Sense Solution for Cognitive Radiobased on Tracing Localization,” In *Proc. of IEEE International Conference on Communications (ICC)*, June 2011.
  - (94) Yonggang Lu, Li Liao, and **R. Wang**, “A Fast Randomized Clustering Method Based on a Hypothetical Potential Field,” In *Proc. of the 7<sup>th</sup> International Symposium on Multispectral Image Processing & Pattern Recognition*, Guilin, China, November 2011.
  - (95) **R. Wang**, Anand Reshamwala, Qinyu Zhang, Zhensheng Zhang, Qing Guo and Ming-Chuan Yang, “The Effect of 'Window Size' on Throughput Performance of DTN in Lossy Cislunar Communications,” In *Proc.*

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- (96) **R. Wang**, Bhuvan Modi, Qinyu Zhang, Jia Hou, Qing Guo and Ming-Chuan Yang, "Use of a Hybrid of DTN Convergence Layer Adapters (CLAs) in Interplanetary Internet," In *Proc. of IEEE International Conference on Communications (ICC)*, June 2012.
  - (97) Z. Wei, **R. Wang**, Q. Zhang and Jia Hou, "Aggregation of DTN Bundles for Channel Asymmetric Space Communications," In *Proc. of IEEE International Conference on Communications (ICC)*, June 2012.
  - (98) **R. Wang**, Siwei Peng, Alaa Sabbagh, Bin Cao, Kanglian Zhao, and Guannan Yang, "Bundle Protocol for Space Communication Networks in Presence of Intermittent Link Connectivity," In *Proceedings of IEEE Global Communications Conference (GLOBECOM) 2018*, Abu Dhabi, UAE, Dec. 9-13, 2018.
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  - (100) L. Liu, **R. Wang**, Y. Zhou, K. Zhao, W. Li, Y. Jin, and J. Fraire, "Energy Consumption of Bundle Protocol for Reliable File Delivery over Deep-Space Channels," In *Proceedings of the 2019 IEEE International Conference on Space Mission Challenges for Information Technology (SMC-IT)*, Pasadena, CA, USA, July 30-August 1, 2019, pp. 106-111.
  - (101) Y. Zhou, **R. Wang**, L. Liu, K. Zhao, W. Li, X. Lin, and J. Fraire, "Effect of Link Disruption on BP/LTP over a Relay-based Communication Architecture for International Space Station," In *Proceedings of the 2019 IEEE International Conference on Space Mission Challenges for Information Technology (SMC-IT)*, Pasadena, CA, USA, July 30-August 1, 2019, pp. 95-99.

## **THESIS/DISSERTATION SUPERVISION**

- (1) H. Varol, Doctor of Engineering (DE), December 2018  
Title: "Performance Modeling of Licklider Transmission Protocol (LTP) via Proactive Transmission of Signaling Segments in Deep-Space Network"
- (2) A. Sabbagh, Doctor of Engineering (DE), July 2016  
Title: "Modeling Effect of Link Disruption on DTN Protocols"
- (3) X. Wu, Doctor of Engineering (DE), December 2013  
Title: "DTN Protocols for Space Communications"
- (4) M. Ghodsi, MSEE, December 2015  
Title: "Analysis of Optimal RTO Timer for Bundle Protocol (BP)"
- (5) D. Wang, MSEE, December 2012  
Title: "Bundle Protocol/Licklider Transmission Protocol (BP/LTP) for LEO- and Deep-Space Communications in Presence of Long Link Disruptions"
- (6) V. J. Lazar, MSEE, December 2010  
Title: "Licklider Transmission Protocol (LTP) over Cis-Martian channels in presence of long disruption"
- (7) H. Davuluri, MSEE, December 2010  
Title: "Delay Tolerant Networking (DTN) for GEO-Satellite Communications"
- (8) R. Bhavanthula, MSEE, August 2010  
Title: "Establishing a High-Speed Testbed for Simulation of Deep-Space Network and Experiments with Interplanetary Overlay Network (ION)"
- (9) B. Ren, MSEE, August 2010  
Title: "Performance of Licklider Transmission Protocol (LTP) in Long-delay and Noisy Interplanetary Communications"
- (10) V. Gullapalli, MSEE, August 2010  
Title: "Licklider Transmission Protocol (LTP)-based DTN for Cislunar Communications in Presence of Long Link Disruption"
- (11) D. Vivek, MSEE, May 2010  
Title: "Delay Tolerant Networking (DTN) over Asymmetric Cislunar Communication Channels"
- (12) H. Jain, MSEE, December 2009  
Title: "Routing Path Selection of Delay Tolerant Networking (DTN) Protocols for Higher Goodput in Interplanetary Internet"
- (13) P. Parikh, MSEE, December 2009  
Title: "Performance of Interplanetary Overlay Networks (ION) over Cislunar Links"



- (14) A. Reshamwala, MSEE, December 2009  
Title: "Performance of Delay Tolerant Networking (DTN) Protocols with Variation of Window Sizes in Space Internet"
- (15) S. D. Choure, MSEE, December 2009  
Title: "Comparison of Delay Tolerant Networking (DTN) Protocols Implementations for Cislunar Communications"
- (16) B. Modi, MSEE, December 2009  
Title: "Experimental Investigation of Hybrid of Delay Tolerant Networking (DTN) Protocols in Interplanetary Internet"
- (17) X. Wu, MSEE, August 2008  
Title: "Experimental evaluation of Delay Tolerant Networking (DTN) Protocols for Cislunar Communications with Link Disruptions"
- (18) T. Wang, MSEE, August 2008  
Title: "Bundle Protocol (BP) over Licklider Transmission Protocol (LTP) for Cislunar Communications"
- (19) Anil Ayyagari, MSEE, December 2007  
Title: "Reliable CFDP over UDP in a Simulated Space Communication Environment"
- (20) Sujeet Pradhanang, MSEE, December 2007  
Title: "Experimental Study of Unreliable CFDP over LEO- and GEO-satellites Links"
- (21) Bidhya Laxmi Shrestha, MSEE, August 2007.  
Title: "Unreliable CCSDS File Delivery Protocol (CFDP) Over Point-to-Point Cislunar Links"
- (22) Prabin Manadhar, MSEE, August 2007.  
Title: "Delay Tolerant Network (DTN) on Cislunar Domain Environment"
- (23) Paradesk Kumar Venkata Rapet, MSEE, August 2007.  
Title: "Performance Evaluation of Delay Tolerant Networking Protocol over Simulated Cislunar Communication Channel"
- (24) Lakshmi Deepika Rudraraju, MSEE, August 2007.  
Title: "Performance Evaluation of CCSDS File Delivery Protocol (CFDP) over Geo-stationary Earth Orbit (GEO) Satellite Links"
- (25) Naga Chainulu Aryasomayajula, MSEE, August 2007.  
Title: "Space Communication Protocol Standards-Transport Protocol (SCPS-TP) over Cislunar Communication Links and Delay Impact"
- (26) Bingxin Tian, MSEE, May 2006.  
Title: "Modeling Optimal Acknowledgement Frequency for Maximum Throughput over Asymmetric Space Links"
- (27) B. Gutha, MSEE, August 2004.  
Title: "Rate-Controlled Transmission Mechanisms over GEO-Space Channels"
- (28) R. Chandrasekaran, MSEE, August 2004.  
Title: "Optimal Packet Size for Space Internet"
- (29) S. Singh, MSEE, May 2004.  
Title: "Effectiveness Evaluation of a Novel Acknowledgment Scheme for Space Internet"
- (30) Sreelaxmi Bonasu, MSEE, Dec. 2003.  
Title: "Optimization of Congestion Control for Space Internet"

## **PROFESSIONAL SERVICES**

### **Editorships**

- (10) Associate Editor, *IEEE Transactions on Aerospace & Electronics Systems*, 2018-Present
- (11) Associate Editor, *IEEE Aerospace & Electronics Systems Magazine*, January 2012-Present
- (12) Associate Editor, *Wiley InterScience's Wireless Communications and Mobile Computing Journal*, Aug. 2006-2010
- (13) Guest Editor, *IEEE Aerospace & Electronics Systems Magazine* Special Issue on "Recent Trends in Interplanetary Communications Systems", 2010.
- (14) Associate Editor, *Journal of Computer Systems, Networks, and Communications (JCSNC)*, July 2007-July 2011.
- (15) Associate Editor, *Wiley's Journal of Security and Communication Networks*, July 2007-July 2011.

- (16) Guest Editor, *Journal of Communications Software and Systems (JCOMSS)* Special Issue on Cross-layer Design for QoS Support in Wireless and Hybrid Networks, 2007

#### **TPC Chairs for Conferences/Workshops and Other Leaderships**

- (1) The 6<sup>th</sup> International Conference on Personal Satellite Services (PSATS) 2014, July28-29 2014, Genova, Italy, Publicity Chair.
- (2) The *International Workshop on Satellite and Space Communications* in 2008 (IWSSC 2008), Toulouse, France, TPC co-chair.
- (3) *IEEE International Conference on Communications (ICC) 2007 Wireless Communications Symposium*, the flagship conference of *IEEE Communications Society*, TPC co-chair.
- (4) President, IEEE Beaumont Section, 2008
- (5) Vice President, IEEE Beaumont Section, 2009-2011
- (6) *Lamar Students Research Conference*, 2004 (co-chair)

#### **Membership of Professional Societies**

- (1) Senior Member, *IEEE Aerospace and Electronic Systems Society* (AESS), 2017-Present
- (2) Senior Member, *IEEE Communications Society*, 2017-Present

#### **Technical Committee Member (incomplete list)**

- (1) *Technical Committee of Satellite and Space Communications (TCSSC)*
- (2) *Technical Committee of Wireless Communications (TCWC)*
- (3) *Technical Committee of Computer Communications (TCCC)*
- (4) *IEEE GLOBECOM Satellite and Space Communication Symposium 2006-2010, 2012-2014*
- (5) *IEEE GLOBECOM Wireless Communication Symposium 2007-2011, 2013-2014*
- (6) *IEEE ICC Symposiums 2007-2012*
- (7) *3rd International Conference on Wireless and Optical Communications Networks (WOCN) 2006*
- (8) *1st International Symposium on Wireless Pervasive Computing 2006*
- (9) *IEEE International Conference on Computer Communications and Networks (ICCCN) 2004*
- (10) *IEEE Wireless Communications and Networking Conference (WCNC) 2007, 2009*
- (11) *1st First International Workshop on Wireless Soft Switch and Mesh Networks 2006*
- (12) *1st International Symposium on Wireless Pervasive Computing 2006*
- (13) *International Workshop on Satellite and Space Communications (IWSSC) 2005, 2007*
- (14) *Tyrrhenian International Workshop on Digital Communications 2017*

#### **Reviewer (incomplete list)**

- (1) *IEEE Transactions on Aerospace and Electronic Systems*
- (2) *IEEE/ACM Transactions on Networking*
- (3) *IEEE Transactions on Wireless Communications*
- (4) *IEEE Transactions on Vehicular Technology*
- (5) *IEEE Communications Magazine*
- (6) *IEEE Wireless Communications*
- (7) *IEEE Communication Letters*
- (8) *IEEE Proceedings*
- (9) *Computer Networks Journal*
- (10) *International Journal of High Performance Computing and Networking*
- (11) *IEEE International Conference on Communications (ICC) 2005-2012*
- (12) *IEEE GLOBECOM 2004-2011*
- (13) *IEEE WCNC 2004, 2005*
- (14) *The Fifth International IEEE Workshop on Local Networks (WLN) 2005*
- (15) *Mobile Ad-hoc and Sensor Networks 2005 (MSN 2005)*
- (16) *International Workshop on Satellite and Space Communications 2005 (IWSSC2005)*.
- (17) *IEEE International Conference on Computer Communications and Networks (ICCCN) 2004*

### **AWARDS, HONORS AND OTHERS**

- (1) **Best Associate Editor**, *IEEE Aerospace & Electronics Systems Magazine*, 2015
- (2) Lamar University Presidential Faculty Fellowships, 2015.
- (3) Nominee for IEEE Communications Society Best Tutorial Paper, 2009.
- (4) University Merit Award, Lamar University, 2007.