Liang Dong, Ph.D.

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Education

Ph.D. Electrical and Computer Engineering, University of Texas at Austin, 2002
M.S. Electrical and Computer Engineering, University of Texas at Austin, 1998
B.S. Applied Physics with minor in Computer Engineering, Shanghai Jiao Tong University, 1996

Professional Appointment

2010 – Present *Associate Professor*, Electrical and Computer Engineering, Western Michigan University
2004 – 2010 *Assistant Professor*, Electrical and Computer Engineering, Western Michigan University
2002 – 2004 *Research Associate*, Electrical Engineering, University of Notre Dame

Grants and Awards

DENSO North America Foundation Grant, P.I., 07.2009 – 06.2010

The US Army Tank-Automotive Research, Development and Engineering Center (TARDEC), Co-P.I., 05.2008 – 12.2010

Michigan Space Grant Consortium, P.I., 06.2008 – 05.2009

Research Development Award, Western Michigan University, 07.2008 – 01.2010

Faculty Research and Creative Activities Award, Western Michigan University, 07.2008 – 06.2009

International Education Faculty Development Fund, Western Michigan University, 05.2008

Michigan Department of Transportation Grant, Co-P.I., 09.2005 – 08.2006

National Instrument, Inc. Support, P.I., 09.2005

Xilinx, Inc. Support, P.I., 09.2004

Graduate Fellowship, University of Texas at Austin, 1999 – 2000

Hua-Xin Scholarship, Shanghai Jiao Tong University, 1994

Professional Memberships

Senior Member of Institute of Electrical and Electronics Engineers (IEEE)
Faculty Advisor of Electrical and Computer Engineering Honor Society IEEE-Eta Kappa Nu (IEEE-HKN) Kappa Omega Chapter
Member of American Society for Engineering Education (ASEE)
Member of Sigma Xi, Tau Beta Pi, Phi Kappa Phi

Professional Activities

Served as *Referee*:

IEEE Transactions on Communications (2005 – Present)
IEEE Transactions on Signal Processing (2007 – Present)
IEEE Transactions on Wireless Communications (2005 – Present)
IEEE Transactions on Vehicular Technology (2003 – Present)
IEEE Transactions on Mobile Computing (2006 – Present)
IEEE Communications Letters (2005 – Present)
IET Communications (IEE Proceedings – Communications) (2006 – Present)
Wiley: Wireless Communications and Mobile Computing (2003 – Present)
Wiley: International Journal of Communication Systems (2006 – Present)
IEEE Int. Conf. on Communications
IEEE Wireless Communications & Networking Conf.
IEEE Vehicular Technology Conf.
IEEE Global Telecommunications Conf.
IEEE Int. Conf. on Acoustics, Speech, and Signal Processing

Served as *Executive Board Member*:

IEEE West Michigan Section (Fall 2006 – Present)
ASEE North Central Section (Summer 2007 – Spring 2008)

Served as *Committee Member*:

Progress in Electromagnetics Research Symposium (PIERS), *Session Chair*, Sept. 2011, Suzhou, China
IEEE Topical Conference on Wireless Sensors and Sensor Networks, Technical Program Committee, Jan. 2011, Phoenix, USA
ECE Department Undergraduate Curriculum Committee (Fall 2004 – Present, Chair since 2007)
ECE Department Assessment Committee (Spring 2005 – Spring 2007)
ECE Department Scholarship Committee (Fall 2007 – Present)
ECE Department Lab/Safety and Security Committee (Fall 2007 – Present)
ECE Department Doctoral Qualifying Exam Sub-Committee (Fall 2007, Fall 2008)
Engineering College Assessment Committee (Spring 2006)
ECE Department *Graduate Advisor* (2008 – Present)

Courses Taught

Regular Courses:

ECE 1000: Fundamentals of Circuits and Electronics
ECE 2210: Electronics I (Course coordinator)
ECE 3200: Electronics II (Course coordinator)
ECE 3510: Engineering for Real-Time Systems
ECE 3570: Computer Architecture
ECE 4550: Digital Signal Processing
ECE 5150: Real-Time Computing
ECE 5510: Application-Specific Integrated Circuits Design
ECE 5550: Advanced Digital Signal Processing

ECE 7250: Doctoral Research Seminar

Graduate Supervision Courses:

ECE 6970: Problems Electrical/Computer Engineering
ECE 7100: Independent Research
ECE 7000: Master Thesis
ECE 7300: Doctoral Dissertation

Participated Courses:

ECE 4810: Electrical/Computer Engineering Design I
ECE 4810: Electrical/Computer Engineering Design II
ECE 6900: Computer Engineering Seminar

Publications

Book Chapter

[1] L. J. Brown, L. Dong, and A. G. Cerullo, "The evaluation of wireless communication devices: To improve in-flight security on-board commercial aircraft," in *Technology Engineering and Management in Aviation: Advancements and Discoveries*, IGI Global, 2010.

Journal Articles

[1] L. Dong, "Mobility-aware opportunistic media access control and routing for mobile ad hoc networks," *Wiley International Journal of Communication Systems*, Accepted for publication.

[2] J. Wang, L. Dong, and Y. Fu, "Modeling of UHF voltage multiplier for radio-triggered wake-up circuits," *Wiley International Journal of Circuits Theory and Application*, DOI 10.1002/cta.692, July 2010.

[3] L. Dong, "Turbo equalization with prediction and iterative estimation of time-varying frequency-selective channels," *Springer Wireless Personal Communications*, vol. 55, no. 4, pp. 631-644, DOI 10.1007/ s11277-009-9824-y, Sept. 2009.

[4] L. Dong, "Open-loop beamforming for frequency-division duplex mobile wireless access," *IEEE Trans. Veh. Technol.*, vol. 56, no. 4, pp. 1845-1849, July 2007.

[5] L. Dong, H. Choo, R. W. Heath, and H. Ling, "Simulation of MIMO channel capacity with antenna polarization diversity," *IEEE Trans. Wireless Commun.*, vol 4, no. 4, pp. 1869-1873, July 2005.

[6] L. Dong, G. Xu, and H. Ling, "Predictive downlink beamforming for wideband CDMA over Rayleigh fading channels," *IEEE Trans. Wireless Commun.*, vol. 4, no. 2, pp. 410-421, Mar. 2005.

[7] A. Alja'afreh and L. Dong, "Multiple target classification and fuzzy logic decision fusion in wireless sensor networks," *Springer Journal of Signal Processing Systems*, Submitted Mar. 2010.

[8] L. Dong, "Cooperative localization and tracking of mobile ad hoc networks," *IEEE Trans. Signal Processing*, Revised Feb. 2010.

[9] A. Alshbatat and L. Dong, "Directional optimized link state routing protocol for unmanned aerial vehicle ad hoc networks," *IEEE Trans. Veh. Technol.*, Submitted Feb. 2010.

[10] L. Dong, "Opportunistic media access control and routing for delay-tolerant mobile ad hoc networks," *IEEE Trans. Wireless Commun.*, Submitted Jan. 2010.

[11] A. Alja'afreh and L. Dong, "Multi-target classification using acoustic signature in wireless sensor networks," *IEEE Trans. Veh. Technol.*, Submitted Jan. 2010.

[12] Y. Zhao, L. Dong, and S. Xi, "Iterative MMSE cooperative localization in wireless networks," *IEEE Trans. Veh. Technol.,* Submitted July 2009, Revised Jan. 2010.

Conference Proceedings

[1] J. Grantner, B. Bazuin, L. Dong, J. Al-shawawreh, R. Hathaway, C. Fajardo, M. P. Castanier, and S. Hussain, "Condition based maintenance for light trucks," In *Proc. IEEE International Conference on Systems, Man, and Cybernetics*, Oct 2010.

[2] A. Alja'afreh and L. Dong, "Ground vehicle classification based on hierarchical hidden Markov model and Gaussian mixture model using wireless sensor networks," In *Proc. IEEE International Conference on Electro/Information Technology (EIT)*, May 2010.

[3] S. Xi, M. D. Zoltowski, and L. Dong, "Iterative MMSE cooperative localization with incomplete pair-wise range measurements," in *Proc. SPIE Defense, Security, and Sensing*, April 2010.

[4] A. Alshbatat and L. Dong, "Cross layer design for mobile ad-hoc unmanned aerial vehicle communication networks," in *Proc. IEEE International Conference on Networking, Sensing and Control*, Apr. 2010.

[5] A. Alshbatat and L. Dong, "Adaptive MAC Protocol for UAV Communication Networks Using Directional Antennas," in *Proc. IEEE International Conference on Networking, Sensing and Control*, Apr. 2010.

[6] A. Alja'afreh and L. Dong, "Hidden Markov model based classification approach for multiple dynamic vehicles in wireless sensor networks," in *Proc. IEEE International Conference on Networking, Sensing and Control*, Apr. 2010.

[7] A. Alja'afreh and L. Dong, "Cooperative detection of moving targets in wireless sensor network based on fuzzy dynamic weighted majority voting decision fusion," in *Proc. IEEE International Conference on Networking, Sensing and Control*, Apr. 2010.

[8] A. Alja'afreh and L. Dong, "An Evaluation of feature extraction methods for vehicle classification based on acoustic signals," in *Proc. IEEE International Conference on Networking, Sensing and Control*, Apr. 2010.

[9] M. S. Salen and L. Dong, "Comparing FCFS & EDF scheduling algorithms for real-time packet switching networks," in *Proc. IEEE International Conference on Networking, Sensing and Control*, Apr. 2010.

[10] Y. Yang, Y. Fu, and L. Dong, "Adaptive IEEE 802.11 MAC protocol based on moving average of effective backoff," in *Proc. The 15th Asia-Pacific Conference on Communications*, Oct. 2009.

[11] L. Wu, Y. Fu, and L. Dong, "End-to-end throughput optimization in multi-hop wireless ad hoc networks," in *Proc. The 15th Asia-Pacific Conference on Communications*, Oct. 2009.

[12] L. Dong, "Turbo equalization with channel prediction and iterative channel estimation," in *Proc. IEEE Wireless Communications and Networking Conference (WCNC)*, Apr. 2009.

[13] L. Dong, "Cooperative network localization via velocity estimation," in *Proc. IEEE Wireless Communications and Networking Conference (WCNC)*, Apr. 2009.

[14] Y. Zhao, L. Dong, J. Wang, B. Hu, and Y. Fu, "Implementing indoor positioning system via ZigBee devices," in *Proc. 42nd Asilomar Conference on Signals, Systems, and Computers*, Oct. 2008.

[15] L. Dong, "Dopper measurements rendering random routing," in *Proc. 42nd Asilomar Conference on Signals, Systems, and Computers*, Oct. 2008.

[16] S. H. Mousavinezhad and L. Dong, "Digital signal processing: theory and practical considerations," in *Proc. ASEE Annual Conference & Exposition*, June 2007.

[17] N. V. Khambekar, L. Dong, and V. Chaudhary, "Utilizing OFDM guard interval for spectrum sensing," in *Proc. IEEE Wireless Communications and Networking Conference (WCNC)*, Mar 2007, pp. 38-42.

[18] L. Dong and F. L. Severance, "Position estimation with moving beacons in wireless sensor networks," in *Proc. IEEE Wireless Communications and Networking Conference (WCNC)*, Mar 2007, pp. 2317-2321.

[19] Y. M. Chen, L. Dong, and J.-S. Oh, "Real-time video relay for UAV traffic surveillance systems through available communication networks," in *Proc. IEEE Wireless Communications and Networking Conference (WCNC)*, Mar 2007, pp. 2608-2612.

[20] K. Ro, J.-S. Oh, and L. Dong, "Lessons learned: application of small UAV for urban highway traffic monitoring," in *Proc. 45th AIAA Aerospace Sciences Meeting and Exhibit*, Jan. 2007.

[21] L. Dong and Y. Zhao, "Frequency-domain Turbo equalization for single carrier mobile broadband systems," in *Proc. IEEE Military Communications Conference (MILCOM)*, Oct. 2006.

[22] L. Dong, "Robust Beamforming for FDD Mobile Systems Over Rayleigh Fading Channels," in *Proc. IEEE International Conference on Electro/Information Technology (EIT)*, May 2005.

[23] L. Dong and M. Atashbar, "An FPGA experience in ASIC design," in *Proc. ASEE North Central Section Spring Conference*, Apr. 2005.

[24] L. Dong, T. Li, and Y.-F. Huang, "Opportunistic transmission scheduling for multiuser MIMO systems," in *Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Apr. 2003, vol. 5, pp. 65-68.

[25] L. Dong, H. Ling, and R. W. Heath, "Multiple-input multiple-output wireless communication systems using antenna pattern diversity," in *Proc. IEEE Global Telecommunications Conference (GLOBECOM)*, Nov. 2002, pp. 997-1001.

[26] L. Dong, G. Xu, and H. Ling, "Prediction of fast fading mobile radio channels in wideband communication systems," in Proc. *IEEE Global Telecommunications Conference* (*GLOBECOM)*, Nov. 2001, pp. 3287-3291.

[27] L. Dong, G. Xu, and H. Ling, "Subspace-based channel estimation for wideband CDMA communication systems," in Proc. *IEEE Military Communications Conference (MILCOM)*, Oct. 2001, pp. 1205-1209.

[28] L. Dong and G. Xu, "Dynamic uplink power control for cellular radio systems over fast fading channel," in *Proc. IEEE Vehicular Technology Conference (VTC)*, May 2001, pp. 2849-2853.

M.S. and Ph.D. Thesis Supervision

Chair of Thesis/Dissertation Committee:

1. Ma'en Saleh Saleh, Ph.D., "Opportunistic routing for delay-tolerant mobile ad hoc network," Current.
2. Adel M. Alturki, M.S., "Optimization of network localization," Current.

3. Ahmad F. Alja'afreh, Ph.D., "Collaborative classification of multiple ground vehicles in wireless sensor networks based on acoustic signals," Doctoral dissertation defense on April 15, 2010.
4. Abdel Ilah N. Alshbatat, Ph.D., "Cross-layer design for mobile ad hoc unmanned aerial vehicle communication networks," Doctoral dissertation defense on April 14, 2010.
5. Yao Zhao, Ph.D., "Communications and positioning in wireless networks," Doctoral dissertation defense on May 20, 2009.
6. Yu Ming Chen, M.S., "Design and simulation of radio-frequency integrated circuits for communications," Graduated in July 2007.
7. Valliammai Murugesan, M.S., "Implementation of indoor wireless multiple-input multiple-output (MIMO) communication system," graduated in May 2007.

Member of Thesis/Dissertation Committee:

1. Imad Mohammad Zyout, Ph.D., "Toward automated detection and diagnosis of mammographic microcalcifications," Doctoral dissertation defense on Sept. 15, 2010.
2. Jumana Ali Al-Shawawreh, Ph.D., "Multi-scale optimization using a genetic approach," Proposal presentation on Mar. 17, 2010.
3. Hanyi Dai, Ph.D., "Design of adaptive collective foraging in swarm robotics system," Doctoral dissertation defense on Mar. 16, 2010.
4. Jing Zhang, Ph.D., "Reinforcement learning in multiagent systems and its application on cognitive radio networks," CS Dept., Proposal presentation on Oct. 30, 2009.
5. Bujanovic, Tomislav, Ph.D., "Spatial frequency localization in mammograms using wavelets," Doctoral dissertation defense on Oct. 15, 2009.
6. Fadi F. Abu-Amara, Ph.D., "Detection of defects in bridges and roads using ground penetrating radar data," Expected to graduate in 2011.
7. Memuna Sarfraz, M.S., "An integrated PCA-FLD classification system for mammography images", Master thesis defense on Nov. 5, 2009.
8. Yinyang Zhai, M.S., "Tilt-rotor aircraft flight control design with PID, H_2, H_∞ and μ synthesis approach," Graduated in June 2005.
9. Paolo A. Tamayo, M.S., "Design of a reconfigurable state transition algorithm for fuzzy automata," Graduated in July 2005.
10. Vincent A. Krause, M.S., "Ground penetrating radar" Graduated in June 2007.

Undergraduate Senior Design Advising

1. Justin Andrews, Kasey Harden, and Jeff Ross, "Vehicle data transceiver," Fall 2009, Spring 2010.
2. Andy Erdman, Andrew Walter, and Kevin Whyte "Smart vehicle: Vehicle ad hoc network," Fall 2009, Spring 2010.
3. Mark Johum, Michael McCabe, Aaron Rose, and Russell Schoenbeck, "Solar car LED traffic safety light system with CAN interface," Fall 2007, Spring 2008.
4. Chintan V. Dagli, Michelle L. Guthaus, and Nathan A. Short, "Wireless multimode motion detection system," Fall 2006, Spring 2007.

5. Shawn A. Brier, Patrick A. Johnson, and Aravind Mathsyaraja, "Wireless battery data acquisition system," Spring 2006, Fall 2006.
6. Nicholas Czarnecki, "Wireless data transmission system," Fall 2005, Spring 2006.
7. Yu Ming Chen, Nari Lee, and Anthony M. Wichey, "Integration of heterogeneous wireless communications systems," Fall 2004, Spring 2005.

Invited Talks and Seminars

1. "Dedicated short-range communication for intelligent transportation systems," Western Michigan University, Sept. 28, 2009, Kalamazoo Michigan.
2. "Wireless sensor networks with energy harvesting technology – A green revolution," Shanghai Jiao Tong University, July 10, 2009, Shanghai China.
3. "Pervasive communication and computing: Fusing the digital and physical worlds," Shanghai Jiao Tong University, July 18, 2008, Shanghai China.
4. "Cognitive radio: Versatile wireless communication systems," Western Michigan University, Oct. 15, 2007, Kalamazoo Michigan.
5. "Mobile broadband wireless access from a cross-layer perspective," Wayne State University, Nov. 28, 2006, Detroit Michigan.
6. "Software defined radio: Reconfigurable wireless technology," Western Michigan University, Sept. 8, 2005, Kalamazoo Michigan.