Curriculum Vitae

Zhi-Hong Mao

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A Education

Ph.D. in Electrical and Medical Engineering, Massachusetts Institute of Technology, Cambridge, MA, September 2005

S.M. in Aeronautics and Astronautics, Massachusetts Institute of Technology, Cambridge, MA, September 2000

M.Eng. with Honors in Pattern Recognition and Intelligent Control, Tsinghua University, Beijing, China, June 1998

Dual Bachelor's Degrees with Honors in Automatic Control and Applied Mathematics, Tsinghua University, Beijing, China, July 1995

B Professional Positions Held

Associate Professor, Department of Electrical and Computer Engineering and Department of Bioengineering (secondary appointment), Swanson School of Engineering, University of Pittsburgh, 9/2011−present; William Kepler Whiteford Faculty Fellow, 9/2012−8/2019

Assistant Professor, Department of Electrical and Computer Engineering and Department of Bioengineering (secondary appointment), Swanson School of Engineering, University of Pittsburgh, 9/2005−8/2011

C Publications

C.1 Refereed Publications

(i) Refereed Journal Papers

[J1] S. Mao, H. Wang, C. Zhu, Z.-H. Mao, and M. Sun. Simultaneous wireless power transfer and data communication using synchronous pulse-controlled load modulation. Measurement, accepted for publication, 2017.

[J2] P. M. Vasandani, B. Gattu, J. Wu, Z.-H. Mao, W. Jia, and M. Sun. Triboelectric nanogenerator using microdome-patterned PDMS as a wearable respiratory energy harvester. Advanced Materials Technologies, accepted for publication, 2017.

[J3] J. Xie, P. K. Meher, M. Sun, Y. Li, B. Zeng, and Z.-H. Mao. Efficient FPGA implementation of low-complexity systolic Karatsuba multiplier over $GF(2^m)$ based on NIST polynomials. IEEE Transactions on Circuits and Systems I: Regular Papers, accepted for publication, 2017.

[J4] R. Xia, A. Muthumani, Z.-H. Mao, and D. Powell. Quantification of neural reflex and muscular intrinsic contributions to parkinsonian rigidity. Experimental Brain Research 234(12), 3587-3595, December 2016.

[J5] P. M. Vasandani, Z.-H. Mao, W. Jia, and M. Sun. Design of simulation experiments to predict triboelectric generator output using structural parameters. Simulation Modeling Practice and Theory 68, 95-107, November 2016.

[J6] R. Khanna, A. Barchowsky, A. A. Amrhein, W. E. Stanchina, G. F. Reed, and Z.-H. Mao. A linear model for characterizing transient behavior in wide bandgap semiconductor-based switching circuits. International Journal of Automation and Power Engineering 5, 1-16, doi: 10.14355/ijape.2016.05.001, 2016.

[J7] V. Patel, M. Burns, Z.-H Mao, N. Crone, and R. Vinjamuri. Linear and nonlinear synergies in grasping hand. Journal of Bioengineering and Biomedical Science 5(3), Article No. 163, doi: 10.4172/2155-9538.1000163 (8 pages), August 2015.

[J8] J. Xie, P. K. Meher, and Z.-H. Mao. High-throughput digit-level systolic multiplier over $GF(2^m)$ based on irreducible trinomials. IEEE Transactions on Circuits and Systems II: Express Briefs 62(5), 481-485, May 2015.

[J9] J. Xie, P. K. Meher, and Z.-H. Mao. Low-latency high-throughput systolic multipliers over $GF(2^m)$ for NIST recommended pentanomials. IEEE Transactions on Circuits and Systems I: Regular Papers 62(3), 881-890, March 2015.

[J10] M. Sun, L. E. Burke, T. Baranowski, J. D. Fernstrom, H. Zhang, H.-C. Chen, Y. Bai, Y. Li, C. Li, Y. Yue, R. J. Sclabassi, Z.-H. Mao, and W. Jia. An exploratory study on a chest-worn computer for evaluation of diet, physical activity and lifestyle. Journal of Healthcare Engineering 6(1), 1-22, March 2015.

[J11] J. Xie, P. K. Meher, and Z.-H. Mao. High-throughput finite field multipliers using redundant basis for FPGA and ASIC implementations. IEEE Transactions on Circuits and Systems I: Regular Papers 62(1), 110-119, January 2015.

[J12] M. F. Lupu, M. Sun, F.-Y. Wang, and Z.-H. Mao. Information-transmission rates in manual control of unstable systems with time delays. IEEE Transactions on Biomedical Engineering 62(1), 342-351, January 2015.

[J13] F. Zhu, S. Chen, Z.-H. Mao, and Q. Miao. Parallel public transportation system and its application in evaluating evacuation plans for large-scale activities. IEEE Transactions on Intelligent Transportation Systems 15(4), 1728-1733, August 2014.

[J14] R. Vinjamuri, V. Patel, M. Powell, Z.-H. Mao, and N. Crone. Candidates for synergies: linear discriminants vs. principal components. Computational Intelligence and Neuroscience, vol. 2014, Article ID 373957, doi: 10.1155/2014/373957 (10 pages), July 2014.

[J15] S. Huang, E. Feron, G. F. Reed, and Z.-H. Mao. Compact configuration of aircraft flows at intersections. IEEE Transactions on Intelligent Transportation Systems 15(2), 771-783, April 2014.

[J16] R. Khanna, Q. Zhang, W. E. Stanchina, G. F. Reed, and Z.-H. Mao. Maximum power point tracking using model reference adaptive control. IEEE Transactions on Power Electronics 29(3), 1490-1499, March 2014.

[J17] Q. Xu, H. Wang, Z. Gao, Z.-H. Mao, J. He, and M. Sun. A novel mat-based system for position-varying wireless power transfer to biomedical implants. IEEE Transactions on Magnetics 49(8), 4774-4779, August 2013.

[J18] Q. Xu, Z. Gao, H. Wang, J. He, Z.-H. Mao, and M. Sun. Batteries not included: a mat-based wireless power transfer system for implantable medical devices as a moving target. IEEE Microwave Magazine 14(2), 63-72, March/April 2013.

[J19] M. F. Lupu, M. Sun, R. Xia, and Z.-H. Mao. Rate of information transmission in human manual control of an unstable system. IEEE Transactions on Human-Machine Systems 43(2), 259-263, March 2013.

[J20] G. F. Reed, B. M. Grainger, A. R. Sparacino, E. Taylor, and Z.-H. Mao. Ship to grid: medium-voltage DC concepts in theory and practice. IEEE Power and Energy Magazine 10(6), 70-79, November/December 2012.

[J21] H. Kim, D. S. Har, Z.-H. Mao, M. Sun, and H.-N. Lee. Efficient joint source-channel decoding of multi-state Markov sequences. IET Communications 6(9), 1038-1044, June 2012.

[J22] C.-C. Chang, T.-Y. Kuo, Y.-C. Lo, H.-N. Lee, D. Askey, and Z.-H. Mao. User-satisfaction based bandwidth allocation for transmission of multiple sources of human perceptual data. Journal of the Franklin Institute 349(3), 879-890, April 2012.

[J23] F. Zhang, J. Liu, Z.-H. Mao, and M. Sun. Mid-range wireless power transfer and its application to body sensor networks. Open Journal of Applied Sciences 2(1), 35-46, March 2012.

[J24] R. Xia and Z.-H. Mao. Progression of motor symptoms in Parkinson's disease. Neuroscience Bulletin 28(1), 39-48, February 2012.

[J25] Y. Ma, J. Yang, L. Hui, Y. Li, Z.-H. Mao, and M. Sun. Novel hand motion tracking system. Journal of Xidian University 39(1), 79-85, 2012. (in Chinese)

[J26] M. F. Lupu, E. Feron, and Z.-H. Mao. Influence of aircraft maneuver preference variability on airspace usage. IEEE Transactions on Intelligent Transportation Systems 12(4), 1446-1461, December 2011.

[J27] Y. Sun, P. J. Hawrylak, Z.-H. Mao, and M. H. Mickle. A novel software radio defined passive RFID reading system with real-time collision resolution. International Journal of Ad Hoc and Ubiquitous Computing 8(4), 261-270, 2011.

[J28] R. Vinjamuri, D. J. Weber, Z.-H. Mao, J. L. Collinger, A. D. Degenhart, J. W. Kelly, M. L. Boninger, E. C. Tyler-Kabara, and W. Wang. Towards synergy based brain machine interfaces. IEEE Transactions on Information Technology in Biomedicine 15(5), 726-736, September 2011.

[J29] H. Zhang, L. Li, W. Jia, J. D. Fernstrom, R. J. Sclabassi, Z.-H. Mao, and M. Sun. Physical activity recognition based on motion in images acquired by a wearable camera. Neurocomputing 74(12-13), 2184-2192, June 2011.

[J30] F. Zhang, S. A. Hackworth, W. Fu, C. Li, Z.-H. Mao, and M. Sun. Relay effect of wireless power transfer using strongly coupled magnetic resonances. IEEE Transactions on Magnetics 47(5), 1478-1481, May 2011.

[J31] Y. Ma, Z.-H. Mao, W. Jia, C. Li, J. Yang, and M. Sun. Magnetic hand tracking for human-computer interface. IEEE Transactions on Magnetics 47(5), 970-973, May 2011.

[J32] H.-N. Lee, S.-Y. Chung, C. Fragouli, and Z.-H. Mao. Network coding for wireless networks. EURASIP Journal on Wireless Communications and Networking, vol. 2010, Article ID 359475, doi: 10.1155/2010/359475 (2 pages), 2010. (Special Issue Editorial)

[J33] L.-J. Zhang, Z. Shan, and Z.-H. Mao. An optimal-control based decision-making model and consulting methodology for services enterprises. IEEE Transactions on Engineering Management 57(4), 607-619, November 2010.

[J34] M. H. Mahmood, C.-C. Chang, D. Jung, Z.-H. Mao, H. Lim, and H.-N. Lee. Throughput behavior of link adaptive 802.11 DCF with MUD capable access node. AEU International Journal of Electronics and Communications 64(11), 1031-1041, November 2010.

[J35] C.-C. Chang, Z.-H. Mao, and H.-N. Lee. A fast BER evaluation method for LDGM codes. Journal of the Franklin Institute 347(7), 1368-1373, September 2010.

[J36] R. Vinjamuri, M. Sun, C.-C. Chang, H.-N. Lee, R. J. Sclabassi, and Z.-H. Mao. Temporal postural synergies of the hand in rapid grasping tasks. IEEE Transactions on Information Technology in Biomedicine 14(4), 986-994, July 2010.

[J37] Y. Ma, W. Jia, C. Li, J. Yang, Z.-H. Mao, and M. Sun. Magnetic hand motion tracking system for human-machine interaction. Electronics Letters 46(9), 621-623, April 2010.

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[J39] R. Vinjamuri, M. Sun, C.-C. Chang, H.-N. Lee, R. J. Sclabassi, and Z.-H. Mao. Dimensionality reduction in control and coordination of the human hand. IEEE Transactions on Biomedical Engineering 57(2), 284-295, February 2010.

[J40] C.-C. Chang, Z.-H. Mao, and H.-N. Lee. MB iterative decoding algorithm on systematic LDGM codes: performance evaluation. Signal Processing 90(1), 373-377, January 2010.

[J41] J. H. Yang, Z.-H. Mao, L. Tijerina, T. Pilutti, J. Coughlin, and E. Feron. Detection of driver fatigue caused by sleep deprivation. IEEE Transactions on Systems, Man, and Cybernetics–Part A 39(4), 694-705, July 2009. (IEEE SMC Society Andrew P. Sage Best Transactions Paper Award, 2010)

[J42] Z.-H. Mao, H.-N. Lee, R. J. Sclabassi, and M. Sun. Information capacity of the thumb and the index finger in communication. IEEE Transactions on Biomedical Engineering 56(5), 1535-1545, May 2009.

[J43] R. Vinjamuri, D. J. Crammond, D. Kondziolka, H.-N. Lee, and Z.-H. Mao. Extraction of sources of tremor in hand movements of patients with movement disorders. IEEE Transactions on Information Technology in Biomedicine 13(1), 49-56, January 2009.

[J44] K. Treleaven and Z.-H. Mao. Conflict resolution and traffic complexity of multiple intersecting flows of aircraft. IEEE Transactions on Intelligent Transportation Systems 9(4), 633-643, December 2008.

[J45] Z.-H. Mao, D. Dugail, and E. Feron. Space partition for conflict resolution of intersecting flows of mobile agents. IEEE Transactions on Intelligent Transportation Systems 8(3), 512-527, September 2007.

[J46] Z.-H. Mao and S. G. Massaquoi. Dynamics of winner-take-all competition in recurrent neural networks with lateral inhibition. IEEE Transactions on Neural Networks 18(1), 55-69, January 2007.

[J47] Z.-H. Mao, D. Dugail, E. Feron, and K. Bilimoria. Stability of intersecting aircraft flows using heading change maneuvers for conflict avoidance. IEEE Transactions on Intelligent Transportation Systems 6(4), 357-369, December 2005.

[J48] S. Jo, J. Yin, and Z.-H. Mao. Random neural networks with state-dependent firing neurons. IEEE Transactions on Neural Networks 16(4), 980-983, July 2005.

[J49] E. Gelenbe, Z.-H. Mao, and Y.-D. Li. Function approximation by random neural networks with a bounded number of layers. Differential Equations and Dynamical Systems 12(1 and 2), 143-170, 2004.

[J50] Z.-H. Mao, E. Feron, and K. Bilimoria. Stability and performance of intersecting aircraft flows under decentralized conflict avoidance rules. IEEE Transactions on Intelligent Transportation Systems 2(2), 101-109, June 2001.

[J51] E. Frazzoli, Z.-H. Mao, J.-H. Oh, and E. Feron. Resolution of conflicts involving many aircraft via semidefinite programming. Journal of Guidance, Control and Dynamics 24(1), 79-86, February 2001.

[J52] E. Gelenbe, Z.-H. Mao, and Y.-D. Li. Function approximation by spiked random networks. IEEE Transactions on Neural Networks 10(1), 3-9, January 1999.

[J53] Z.-H. Mao, Y.-D. Li, and Z. Sun. Comments on fuzzy systems approximation by frames (SISO case). Fuzzy Sets and Systems 100, 373-375, November 1998.

[J54] Z.-H. Mao, Y.-D. Li, and X. Zhang. Approximation capability of fuzzy systems using translations and dilations of one fixed function as membership functions. IEEE Transactions on Fuzzy Systems 5(3), 468-473, August 1997.

[J55] Z.-H. Mao, X. Zhang, and Y.-D. Li. On universal approximation capability of fuzzy systems. Science in China (Series E, English version) 41(1), 6-12, February 1998.

[J56] Z.-H. Mao and Y. Lin. Extended random neural network model and its probability structure features. Journal of Tsinghua University 38(3), 100-103, 1998. (in Chinese)

[J57] T. Zhang, Z.-H. Mao, and S. Xia. A method to extract numeral string overlapping borders. Chinese Information Journal 12(2), 25-30, 1998. (in Chinese)

[J58] L.-J. Zhang, Z.-H. Mao, and Y.-D. Li. Mathematical analysis of mutation operator in genetic algorithms and its improved strategy. Journal of Electronics 14(2), 154-158, April 1997.

(ii) Chapters in Edited Books

[B1] K. Nixon, Y. Chen, Z.-H. Mao, and K. Li. User classification and authentication for MOBILE device based on gesture recognition. Network Science and Cybersecurity (Editor: R. E. Pino), Springer, 125-135, 2014.

[B2] R. Vinjamuri, W. Wang, M. Sun, and Z.-H. Mao. Application of linear and nonlinear dimensionality reduction methods. Principal Component Analysis (Editor: P. Sanguansat), InTech–Open Access Publisher, Chapter 6, 107-128, 2012.

[B3] E. Gelenbe, Z.-H. Mao, and Y.-D. Li. Deterministic computation with random G-networks. Fundamental Concepts in Computer Science (Editors: E. Gelenbe and J.-P. Kahane), Imperial College Press, Chapter 4, 71-96, 2009.

[B4] S. Jo and Z.-H. Mao. Basal ganglionic learning applied to control of an underactuated system. Neurocomputing Research Developments (Editor: H. A. Svensson), Nova Science Publisher, Chapter 7, 181-200, 2008.

(iii) Papers in Refereed Conference Proceedings

[C1] K.-J. Wang, L. Zhang, B. Luan, H.-W. Tung, Q. Liu, J. Wei, M. Sun, and Z.-H. Mao. Brain-computer interface combining eye saccade two-electrode EEG signals and voice cues to improve the maneuverability of wheelchair. Proceedings of the 15th IEEE/RAS-EMBS International Conference on Rehabilitation Robotics (ICORR 2017), London, UK, accepted for publication, July 2017.

[C2] A. Barchowsky, J. P. Kozak, M. R. Hontz, W. E. Stanchina, G. F. Reed, Z.-H. Mao, and R. Khanna. Analytical and experimental optimization of external gate resistance for safe rapid turn on of normally off GaN HFETs. Proceedings of the IEEE Applied Power Electronics Conference (APEC 2017), Tampa, FL, USA, 1958-1963, March 2017.

[C3] L. Zhang, H. Chen, K.-J. Wang, and Z.-H. Mao. Internet of brain: decoding human intention and coupling EEG signals with Internet services. Proceedings of the 9th International Conference on Services Science (ICSS 2016), Chongqing, China, accepted for publication, October 2016.

[C4] K.-J. Wang, M. Sun, and Z.-H. Mao. Human-robot mutual force borrowing and seamless leader-follower role switching by learning and coordination of interactive impedance. Proceedings of the 2016 International Symposium on Wearable Robotics (WeRob 2016), La Granja, Segovia, Spain, published in Wearable Robotics: Challenges and Trends, vol. 16 of the Series Biosystems and Biorobotics, 427-432, October 2016.

[C5] A. H. Dallal, Y. Chen, D. J. Weber, and Z.-H. Mao. Dictionary learning for sparse representation and classification of neural spikes. Proceedings of the 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2016), Orlando, FL, USA, 3486-3489, August 2016.

[C6] X. Xie, M. Sun, W. Jia, G. Yang, Z.-H. Mao, and H. Xu. Reuse of WiFi information for indoor monitoring of the elderly. Proceedings of the IEEE 17th International Conference on Information Reuse and Integration (IRI 2016), Pittsburgh, PA, USA, 261-264, July 2016.

[C7] B. M. Grainger, Q. Zhang, G. F. Reed, and Z.-H. Mao. Modern controller approaches for stabilizing constant power loads within a DC microgrid while considering system delays. Proceedings of the 7th IEEE International Symposium on Power Electronics for Distributed Generation Systems (PEDG 2016), Vancouver, Canada, doi: 10.1109/PEDG.2016.7527001 (6 pages), June 2016.

[C8] K.-J. Wang, M. Sun, R. Xia, and Z.-H. Mao. Human-robot symbiosis framework for exoskeleton devices. Proceedings of 2016 IEEE International Conference on Industrial Technology (ICIT 2016), Taipei, Taiwan, 1500-1506, March 2016.

[C9] K. Nixon, X. Chen, Z.-H. Mao, and Y. Chen. SlowMo—enhancing mobile gesture-based authentication schemes via sampling rate optimization. Proceedings of the 21st Asia and South Pacific Design Automation Conference (ASP-DAC 2016), Macau, China, 462-467, January 2016.

[C10] W. Jia, Y. Li, Y. Bai, Z.-H. Mao, M. Sun, and Q. Zhao. Estimation of heart rate from a chest-worn inertial measurement unit. Proceedings of 2015 International Symposium on Bioelectronics and Bioinformatics (ISBB 2015), Beijing, China, 148-151, October 2015.

[C11] K.-J. Wang, M. Sun, L. Zhang, and Z.-H. Mao. Mastering human-robot interaction control techniques using Chinese Tai Chi Chuan: mutual learning, intention detection, impedance adaptation, and force borrowing. Proceedings of the 5th International Conference on Development and Learning and on Epigenetic Robotics (ICDL-EpiRob), Providence, RI, USA, 104-105, August 2015.

[C12] B. M. Grainger, G. F. Reed, and Z.-H. Mao. Model reference controller design for stabilizing constant power loads in an offshore medium voltage DC microgrid. Proceedings of the 16th IEEE Workshop on Control and Modeling for Power Electronics (COMPEL 2015), Vancouver, Canada, doi: 10.1109/COMPEL.2015.7236495 (8 pages), July 2015.

[C13] P. Vasandani, H. Wang, Z.-H. Mao, and M. Sun. Preliminary study on triboelectric generator harvesting energy from breathing motion. Proceedings of the IEEE 41st Annual Northeast Bioengineering Conference (NEBEC 2015), Troy, NY, USA, doi: 10.1109/NEBEC.2015.7117132 (2 pages), April 2015.

[C14] Y. Li, W. Jia, B. Luan, Z.-H. Mao, H. Zhang, and M. Sun. A FPGA implementation of JPEG baseline encoder for wearable devices. Proceedings of the IEEE 41st Annual Northeast Bioengineering Conference (NEBEC 2015), Troy, NY, USA, doi: 10.1109/NEBEC.2015.7117173 (2 pages), April 2015.

[C15] Y. Li, W. Jia, T. Yu, B. Luan, Z.-H. Mao, H. Zhang, and M. Sun. A low power, parallel wearable multi-sensor system for human activity evaluation. Proceedings of the IEEE 41st Annual Northeast Bioengineering Conference (NEBEC 2015), Troy, NY, USA, doi: 10.1109/NEBEC.2015.7117174 (2 pages), April 2015.

[C16] K.-J. Wang, M. Sun, R. Xia, and Z.-H. Mao. Co-adaptive optimal control framework for human-robot physical symbiosis. Proceedings of the 10th Annual ACM/IEEE International Conference on Human-Robot Interaction (HRI 2015) Extended Abstracts, Portland, OR, USA, 241-242, March 2015.

[C17] Y. Bai, W. Jia, H. Zhang, Z.-H. Mao, and M. Sun. Landmark-based indoor positioning for visually impaired individuals. Proceedings of the 12th IEEE International Conference on Signal Processing (ICSP 2014), Hangzhou, China, 668-671, October 2014.

[C18] R. Wang, W. Jia, Z.-H. Mao, R. J. Sclabassi, and M. Sun. Cuff-free blood pressure estimation using pulse transit time and heart rate. Proceedings of the 12th IEEE International Conference on Signal Processing (ICSP 2014), Hangzhou, China, 115-118, October 2014.

[C19] M. Sun, L. E. Burke, Z.-H. Mao, Y. Chen, H.-C. Chen, Y. Bai, Y. Li, C. Li, and W. Jia. eButton: A wearable computer for health monitoring and personal assistance. Proceedings of the 51th Design Automation Conference (DAC 2014), San Francisco, CA, USA, doi: 10.1145/2593069.2596678 (6 pages), June 2014. (Invited Paper)

[C20] Y. Bai, W. Jia, Z.-H. Mao, and M. Sun. Automatic eating detection using a proximity sensor. Proceedings of the IEEE 40th Annual Northeast Bioengineering Conference (NEBEC 2014), Boston, MA, USA, doi: 10.1109/NEBEC.2014.6972716 (2 pages), April 2014.

[C21] Y. Bai, L. Krishnamurti, W. Jia, Z.-H. Mao, and M. Sun. An electronic six-minute walk test platform for clinical applications. Proceedings of the IEEE 40th Annual Northeast Bioengineering Conference (NEBEC 2014), Boston, MA, USA, doi: 10.1109/NEBEC.2014.6972715 (2 pages), April 2014.

[C22] B. M. Grainger, G. F. Reed, T. E. McDermott, Z.-H. Mao, V. Kounev, and D. Tipper. Analysis of an offshore medium voltage DC microgrid environment—Part I: Power sharing controller design. Proceedings of the 2014 IEEE PES Transmission and Distribution (T&D) Conference and Exposition, Chicago, IL, USA, doi: 10.1109/TDC.2014.6863405 (5 pages), April 2014.

[C23] Z. Li, W. Jia, Z.-H. Mao, J. Li, H.-C. Chen, W. Zuo, K. Wang, and M. Sun. Anthropometric body measurements based on multi-view stereo image reconstruction. Proceedings of the 35th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2013), Osaka, Japan, 366-369, July 2013.

[C24] Y. Bai, W. Jia, H. Zhang, Z.-H. Mao, and M. Sun. Helping the blind to find the floor of destination in multistory buildings using a barometer. Proceedings of the 35th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2013), Osaka, Japan, 4738-4741, July 2013.

[C25] B. Liu, M. Hu, T. Huang, H. Li, Z.-H. Mao, W. Zhang, and Y. Chen. Digital-assisted noise-eliminating training for memristor crossbar-based analog neuromorphic computing engine. Proceedings of the 50th Design Automation Conference (DAC 2013), Austin, TX, USA, Article No. 7 (6 pages), June 2013.

[C26] R. Khanna, A. Amrhein, W. E. Stanchina, G. F. Reed, and Z.-H. Mao. An analytical model for evaluating the influence of device parasitics on Cdv/dt induced false turn-on in SiC MOSFETs. Proceedings of the IEEE Applied Power Electronics Conference (APEC 2013), Long Beach, CA, USA, 518-525, March 2013. (APEC Technical Presentation Award)

[C27] K. Nixon, X. Chen, Z.-H. Mao, K. Li, and Y. Chen. Mobile user classification and authorization based on gesture usage recognition. Proceedings of the 18th Asia and South Pacific Design Automation Conference (ASP-DAC 2013), Yokohama, Japan, 384-389, January 2013. (Invited Paper)

[C28] G. F. Reed, B. M. Grainger, A. R. Sparacino, E. J. Taylor, M. J. Korytowski, and Z.-H. Mao. Medium voltage DC technology developments, applications, and trends. CIGRE US National Committee (USNC) 2012 Grid of the Future Symposium, Kansas City, MO, USA, October 2012.

[C29] S. Huang, E. Feron, and Z.-H. Mao. Optimal configuration for intersecting flows of aircraft. Proceedings of the 15th International IEEE Conference on Intelligent Transportation Systems (ITSC 2012), Anchorage, Alaska, USA, 1447-1452, September 2012.

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[C31] H. Wang, Z.-H. Mao, Q. Xu, and M. Sun. Relay effect on wireless power transfer using resonant coupling. Proceedings of the IEEE 38th Annual Northeast Bioengineering Conference (NEBEC 2012), Philadelphia, PA, USA, 428-429, March 2012.

[C32] Y. Bai, C. Li, Y. Yue, W. Jia, J. Li, Z.-H. Mao, and M. Sun. Designing a wearable computer for lifestyle evaluation. Proceedings of the IEEE 38th Annual Northeast Bioengineering Conference (NEBEC 2012), Philadelphia, PA, USA, 93-94, March 2012.

[C33] M. F. Lupu, M. Sun, and Z.-H. Mao. Bandwidth limitations in human control tasks. Proceedings of the 2nd IASTED (International Association of Science and Technology for Development) International Conference on Robotics (Robo 2011), Pittsburgh, PA, USA, doi: 10.2316/P.2011.752-031 (6 pages), November 2011.

[C34] L. Li, H. Zhang, W. Jia, Z.-H. Mao, Y. You, and M. Sun. Indirect activity recognition using a target-mounted camera. Proceedings of the 4th International Congress on Image and Signal Processing (CISP 2011), Shanghai, China, 487-491, October 2011.

[C35] T. Hand, Z.-H. Mao, and E. Feron. Stability of spatially distributed, intersecting aircraft flows under sequential conflict resolution schemes. Proceedings of 2011 American Control Conference (ACC 2011), San Francisco, CA, USA, 2168-2173, June-July 2011.

[C36] H. Xu, I. Umez-Eronini, Z.-H. Mao, and A. K. Jones. Towards improving renewable resource utilization with plug-in electric vehicles. Proceedings of 2011 IEEE PES Innovative Smart Grid Technologies (ISGT) Conference, Anaheim, CA, USA, doi: 10.1109/ISGT.2011.5759189 (6 pages), January 2011.

[C37] M. F. Lupu, E. Feron, and Z.-H. Mao. Traffic complexity of intersecting flows of aircraft under variations of pilot preferences in maneuver choice. Proceedings of the 49th IEEE Conference on Decision and Control (CDC 2010), Atlanta, GA, USA, 1189-1194, December 2010. (Invited Paper)

[C38] M. F. Lupu, M. Sun, D. Askey, R. Xia, and Z.-H. Mao. Human strategies in balancing an inverted pendulum with time delay. Proceedings of the 32nd International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2010), Buenos Aires, Argentina, 5246-5249, August-September 2010.

[C39] R. O'Connor, G. Reed, Z.-H. Mao, and A. K. Jones. Improving renewable resource utilization through integrated generation management. Proceedings of 2010 IEEE PES General Meeting, Minneapolis, MN, USA, doi: 10.1109/PES.2010.5589530 (6 pages), July 2010.

[C40] R. Xia, M. Radovic, A. J. Threlkeld, and Z.-H. Mao. System identification and modeling approach to characterizing rigidity in Parkinson's disease: neural and non-neural contributions. Proceedings of the 4th International Conference on Bioinformatics and Biomedical Engineering (iCBBE 2010), Chengdu, China, Paper No. 40046 (4 pages), doi: 10.1109/ICBBE.2010.5514861, June 2010.

[C41] Y. Ma, Z.-H. Mao, W. Jia, C. Li, J. Yang, and M. Sun. Magnetic hand tracking for human-computer interface. Proceedings of the 14th Biennial IEEE Conference on Electromagnetic Field Computation (CEFC), Chicago, IL, USA, Paper No. CEFC2010-1745 (1 page), doi: 10.1109/CEFC.2010.5481499, May 2010.

[C42] G. F. Reed, B. M. Grainger, H. Bassi, E. Taylor, Z.-H. Mao, A. K. Jones. Analysis of high capacity power electronic technologies for integration of green energy management. Proceedings of IEEE PES Transmission and Distribution Conference and Exposition, New Orleans, LA, USA, Paper No. 2010TD0379 (10 pages), doi: 10.1109/TDC.2010.5484374, April 2010.

[C43] J. Nie, J. D. Fernstrom, R. J. Sclabassi, M. H. Fernstrom, Z. Wei, L. Li, W. Zhang, W. Jia, Z.-H. Mao, and M. Sun. Automatic detection of dining plates in digital video. Proceedings of the IEEE 36th Annual Northeast Bioengineering Conference, New York City, NY, USA, Paper No. ABS-095 (2 pages), doi: 10.1109/NEBC.2010.5458190, March 2010.

[C44] R. Vinjamuri, M. Sun, D. J. Weber, W. Wang, D. Crammond, and Z.-H. Mao. Quantizing and characterizing the variance of hand postures in a novel transformation task. Proceedings of the 31st International Conference of the IEEE Engineering in Medicine and Biology Society, Minneapolis, MN, USA, 5312-5315, September 2009.

[C45] L.-J. Zhang, Z.-H. Mao, and N. Zhou. Design quality analytics of traceability enablement in service-oriented solution design environment. Proceedings of the 7th IEEE International Conference on Web Services (ICWS 2009), Los Angeles, CA, USA, 944-951, July 2009.

[C46] R. Vinjamuri, M. Sun, D. Crammond, R. Sclabassi, and Z.-H. Mao. Inherent bimanual postural synergies in hands. Proceedings of the 30th International Conference of the IEEE Engineering in Medicine and Biology Society, Vancouver, British Columbia, Canada, 5093-5096, August 2008.

[C47] R. Vinjamuri, Z.-H. Mao, R. Sclabassi, and M. Sun. Time-varying synergies in velocity profiles of finger joints of the hand during reach and grasp. Proceedings of the 29th International Conference of the IEEE Engineering in Medicine and Biology Society, Lyon, France, 4846-4849, August 2007.

[C48] R. Vinjamuri, Z.-H. Mao, R. Sclabassi, and M. Sun. Limitations of surface EMG signals of extrinsic muscles in predicting postures of human hand. Proceedings of the 28th International Conference of the IEEE Engineering in Medicine and Biology Society, New York City, NY, USA, 5491-5494, September 2006.

[C49] R. Vinjamuri, Z.-H. Mao, R. Sclabassi, and M. Sun. A novel architecture for the design of prosthetic and robotic hands. Proceedings of the IEEE 32nd Annual Northeast Bioengineering Conference, Easton, PA, USA, 163-164, April 2006.

[C50] E. Gelenbe, Z.-H. Mao, and Y.-D. Li. Function approximation by random neural networks with a bounded number of layers. Proceedings of the 17th European Simulation Multiconference, Nottingham, UK, 5-24, June 2003.

[C51] D. Dugail, Z.-H. Mao, and E. Feron. Stability of intersecting aircraft flows under centralized and decentralized conflict avoidance rules. Proceedings of AIAA Guidance, Navigation, and Control Conference, Montreal, Canada, Paper No. AIAA-2001-4296 (7 pages), August 2001.

[C52] Z.-H. Mao and E. Feron. Stability and performance of intersecting aircraft flows under sequential conflict resolution. Proceedings of 2001 American Control Conference, Arlington, VA, USA, vol. 2, 722-729, June 2001.

[C53] Z.-H. Mao, E. Feron, and K. Bilimoria. Stability of intersecting aircraft flows under decentralized conflict avoidance rules. Proceedings of AIAA Guidance, Navigation and Control Conference, Denver, CO, USA, Paper No. AIAA-2000-4271 (11 pages), August 2000.

[C54] K. Bilimoria, H. Q. Lee, Z.-H. Mao, and E. Feron. Comparison of centralized and decentralized conflict resolution strategies for multiple-aircraft problems. Proceedings of AIAA Guidance, Navigation, and Control Conference, Denver, CO, USA, Paper No. AIAA-2000-4268 (10 pages), August 2000.

[C55] E. Gelenbe, Z.-H. Mao, and Y.-D. Li. Approximation by random networks with bounded number of layers. Proceedings of IEEE Workshop on Neural Networks for Signal Processing, Madison, WI, USA, 166-175, August 1999.

[C56] E. Gelenbe, Z.-H. Mao, and Y.-D. Li. Approximation with spiked random networks. Proceedings of the 37th IEEE Conference on Decision and Control, Tampa, FL, USA, vol. 1, 523-528, December 1998.

[C57] L.-J. Zhang, Z.-H. Mao, and Y.-D. Li. Mathematical analysis of crossover operator in genetic algorithm and its improved strategy. Proceedings of IEEE International Conference on Evolutionary Computing, Australia, 412-417, November-December 1995.

[C58] L.-J. Zhang, Z.-H. Mao, and Y.-D. Li. Mathematical analysis of mutation operator in genetic algorithms and its improved strategy. Proceedings of International Conference on Neural Information Processing, China, vol. 1, 267-270, 1995.

[C59] L.-J. Zhang, Z.-H. Mao, and Y.-D. Li. An improved genetic algorithm based on combinatorial theory and fuzzy reasoning and its applications. Proceedings of International Conference on Neural Information Processing, Korea, 180-185, 1994.

C.2 Non-Refereed Publications

(i) Papers in Non-Refereed Conference Proceedings

[N1] M. Sun, L. E. Burke, T. Baranowski, Z.-H. Mao, and W. Jia. Lifestyle-logging with the eButton—results from dietary and physical activity assessment studies. International

Society of Behavioral Nutrition and Physical Activity (ISBNPA) Annual Meeting, Cape Town, South Africa, June 2016. (Abstract)

[N2] K.-J. Wang, L. Zhang, M. Sun, and Z.-H. Mao. Awakening the force: decoding human intention through the coupling of EEG signal and saccade movement to control wearable devices. The 11th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2016) Workshop on Intention Recognition in Human-Robot Interaction, March 2016.

[N3] R. Xia, A. Muthumani, Z.-H. Mao, and D. Powell. Natural history of rigidity in Parkinson's disease. Society for Neuroscience Annual Meeting, Chicago, IL, USA, October 2015. (Abstract)

[N4] R. Xia, D. Powell, and Z.-H. Mao. Comparison of progression rate between neural and non-neural rigidity components in Parkinson's disease. Society for Neuroscience Annual Meeting, Washington, DC, USA, November 2014. (Abstract)

[N5] Y. Bai, N. Marco, W. Jia, H. Zhang, Z.-H. Mao, J. Zgibor, L. Burke, S. Albert, A. Newman, and M. Sun. Electronic platform for automatic short performance physical battery (SPPB) test. Biomedical Engineering Society (BMES) Annual Meeting, San Antonio, TX, USA, October 2014. (Abstract)

[N6] Z.-H. Mao. Information-transmission rates in neural control of unstable systems. The 5th Annual World Congress of NeuroTalk, Nanjing, China, May 2014. (Abstract)

[N7] Z.-H. Mao. Control theoretic methods in computational neuroscience. The 5th Annual World Congress of NeuroTalk, Nanjing, China, May 2014. (Abstract, in Chinese)

[N8] K. Nixon, X. Chen, Z.-H. Mao, K. Li, and Y. Chen. The invisible shield: user classification and authentication for mobile device based on gesture recognition. Design Automation Conference (DAC 2013), Austin, TX, USA, June 2013. (Work-in-progress abstract)

[N9] C.-C. Chang, H.-N. Lee, D. Askey, and Z.-H. Mao. User-satisfaction based bandwidth allocation for transmission of multiple sources of human perceptual data. The 1st International Conference on Engineering and Technology Innovation, Kenting, Taiwan, November 2011. (Abstract)

[N10] M. F. Lupu, M. Sun, and Z.-H. Mao. Information capacity of human manual control of unstable systems. NSF Engineering Research and Innovation Conference, Atlanta, GA, USA, January 2011.

[N11] R. Vinjamuri, D. Weber, J. Collinger, A. Degenhart, J. Kelly, E. Tyler-Kabara, M. Boninger, Z.-H. Mao, and W. Wang. Towards synergy based brain machine interfaces. Society for Neuroscience Annual Meeting, San Diego, CA, USA, November 2010. (Abstract)

[N12] Y. Ma, W. Jia, C. Li, J. Yang, Z.-H. Mao, and M. Sun. A magnetic hand motion tracking system for human-machine interaction. The 11th Joint MMM (Magnetism and Magnetic Materials)-Intermag Conference, Washington, DC, USA, January 2010. (Digest)

[N13] R. Vinjamuri, M. Sun, and Z.-H. Mao. A framework for extracting kinematic synergies of hand movement. NSF Engineering Research and Innovation Conference, Honolulu, HI, USA, June 2009.

[N14] R. Vinjamuri, M. Sun, R. Sclabassi, and Z.-H. Mao. Temporal variation of postural synergies of the human hand during grasping. The 16th International Conference on Mechanics in Medicine and Biology, Pittsburgh, PA, USA, July 2008.

[N15] R. Vinjamuri, D. Crammond, D. Kondziolka, and Z.-H. Mao. Extraction of neural sources from kinematic profiles of hand movement. NSF Engineering Research and Innovation Conference, Knoxville, TN, USA, January 2008.

[N16] J. H. Yang, Z.-H. Mao, T. Pilutti, L. Tijerina, and E. Feron. Detection of human drowsiness in simulated driving: experimental design and preliminary results. The 4th Annual STISIM Drive User Group Meeting, Cambridge, MA, USA, October 2006. (Abstract)

[N17] T. M. Ngo, Z.-H. Mao, and S. G. Massaquoi. Procedural learning of fourth order sequential dependencies. Society for Neuroscience Annual Meeting, Atlanta, GA, USA, November 2006. (Abstract)

[N18] Z.-H. Mao and S. G. Massaquoi. Dynamics of winner-take-all competition in striatal networks and their role in Parkinsonian rest tremor and rigidity. Society for Neuroscience Annual Meeting, Washington DC, USA, November 2005. (Abstract)

[N19] Z.-H. Mao and S. G. Massaquoi. A multi-input multi-output adaptive switching (MIMOAS) model of frontocortical and basal ganglionic interaction in procedural learning. Society for Neural Control of Movement Annual Meeting, Key Biscayne, FL, USA, April 2005. (Abstract)

[N20] Z.-H. Mao, E. J. Lim, and S. G. Massaquoi. A model of “lower” cortico-basal ganglia-thalamocortical circuit function and dysfunction. Society for Neuroscience Annual Meeting, Orlando, FL, USA, November 2002. (Abstract)

(ii) Patents Granted or Pending

[P1] Q. Xu, M. Sun, H. Wang, Z.-H. Mao, and J. He. Resonance-based wireless power transfer system. US Patent No. 9,368,274 B2, 6/14/2016.

[P2] R. Vinjamuri, W. Wang, Z.-H. Mao, and D. Weber. Human-machine interface based on task-specific temporal postural synergies. US Patent No. 9,034,055 B2, 5/19/2015.

[P3] Y. Chen, Z.-H. Mao, and K. W. Nixon. Usage modeling (the invisible shield: user classification and authentication for mobile device based on continuous gesture recognition), Application No. 14/767,485 (International Application No. PCT/US2014/024211), filed on 8/12/2015.

(iii) Invited Presentations

Information transmission and learning in human-machine interaction, Tsinghua University, Beijing, China, 10/15/2016

Adaptive control with random G-networks, Imperial College, London, UK, 9/22/2015

Information-transmission rates in neural control of unstable systems, Carnegie Mellon University, Pittsburgh, PA, USA, 2/11/2015

Information-transmission rates in neural control of unstable systems, the 5th Annual World Congress of NeuroTalk, Nanjing, China, 5/17/2014

Control theoretic methods in computational neuroscience, the 5th Annual World Congress of NeuroTalk, Nanjing, China, 5/17/2014

Tutorial: entropy and information theory, Department of Neurological Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA, 6/12/2012

Control-theoretic approaches for the study of neural control of movement, Department of Neurological Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA, 5/25/2012

The neural system for motor control, Carnegie Mellon University, Pittsburgh, PA, USA, 11/10/2011

Dimensionality reduction in control and coordination of the human hand, Rutgers, State University of New Jersey, USA, 3/9/2011

Traffic complexity of intersecting flows of aircraft under variations of pilot preferences in maneuver choice, Invited Session on Air Traffic Control Systems Theory, the 49th IEEE Conference on Decision and Control, Atlanta, GA, USA, 12/15/2010

Dimensionality reduction in control and coordination of the human hand, Biomedical Circuits and Systems Workshop, San Jose, CA, USA, 11/11/2010

Dimensionality reduction in control and coordination of the human hand, Stony Brook University, Stony Brook, NY, USA, 7/16/2010

Dimensionality reduction in control and coordination of the human hand, Georgia Institute of Technology, Atlanta, GA, USA, 4/24/2009

Conflict resolution and traffic complexity of intersecting flows of aircraft, Department of Civil and Environmental Engineering, University of Pittsburgh, PA, 10/26/2007

Minimizing the impact of network latency in telesurgery, Energid Technologies Corporation, Cambridge, MA, USA, 10/2/2007

The l_1-magic, Department of Neurological Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA, 3/12/2007

Neural control of hand movement, IEEE Research Workshop, Pittsburgh, PA, USA, 11/10/2006

Basic concepts and principles of automatic control and neurocontrol, IEEE Engineering in Medicine and Biology Society, Pittsburgh, PA, USA, 11/9/2006

Modeling the role of the basal ganglia in motor control and learning, University of California, Los Angeles, CA, USA, 6/5/2006

D Externally Funded Research Proposals

D.1 Peer-Reviewed Proposals

1) Biomimetic self-adhesive dry EEG electrodes
   - Agency: NIH, subcontract with UPMC Department of Neurological Surgery
   - Grant number: NIH R01 EB013174-03
   - Level of support: $16K for subcontract
   - Period of support: 1/2016–7/2016
   - Role: Subcontract PI
   - PI: Mingui Sun
   - Summary: This project aims to develop a novel skin-surface electroencephalogram (EEG) electrode, which is able to penetrate scalp hair easily during electrode placement and self-adhere to the scalp without glue or tape.
2) CPS: Synergy: Collaborative Research: Design and control of high-performance provably-safe autonomy-enabled dynamic transportation networks
   - Agency: NSF
   - Grant number: NSF CNS-1544578
   - Level of support: $213K (Pitt)
   - Period of support: 9/2015–8/2018
   - Role: PI
   - Collaborator: Sertac Karaman (PI of Massachusetts Institute of Technology)
   - Summary: This project aims to develop a foundational understanding of how automated vehicles can interact in hubs to maximize their performance, while guaranteeing safety

at all times, and to develop rigorous bounds on performance with respect to the network variables.

3) CSR: Small: OREO: Tri-layer optimization for power efficient OLED display
   - Agency: NSF
   - Grant number: NSF CNS-1422057
   - Level of support: $250K
   - Period of support: 9/2014–8/2018
   - Role: PI
   - Former PI: Yiran Chen (9/2014–4/2017)
   - Summary: This project aims to develop new models for representing mixed-criticality systems, new metrics for quantifying the effectiveness of techniques for designing such systems (particularly from a SWaP perspective), and new methods for performing resource allocation and scheduling in integrated architectures that support mixed-criticality systems.

4) Wearable eButton for evaluation of energy balance with environmental context and behavior
   - Agency: NIH, subcontract with UPMC Department of Neurological Surgery
   - Grant number: NIH R01 CA165255-01
   - Level of support: $203K for subcontract
   - Period of support: 9/2012–8/2016
   - Role: Subcontract PI
   - PI: Mingui Sun
   - Summary: This project aims to develop an advanced, button-like electronic device (eButton) that contains a powerful microprocessor, a novel eating detector, a digital camera, and a variety of electronic sensors to automatically, jointly and objectively measure energy intake and expenditure.

5) CAREER: STT-RAM based memory hierarchy and management in embedded systems
   - Agency: NSF
   - Grant number: NSF CNS-1311706
   - Level of support: $450K
   - Period of support: 9/2012–8/2018
   - Role: Senior Personnel
   - PI: Hai (Helen) Li
   - Summary: This project aims to develop an innovative spin-transfer torque random access memory (STT-RAM) based memory hierarchy to meet the demands of modern embedded systems for low-power, fast speed, and high-density on-chip data storage.

6) Development and evaluation of a novel wireless EEG monitoring sensor
   - Agency: NIH, subcontract with University of Cincinnati under POC-CENT (Point of Care Center for Emerging Neurotechnologies)
   - Grant number: NIH U54 EB007954-05
   - Level of support: $174K for subcontract
   - Period of support: 1/2012–6/2014
   - Role: Subcontract Co-I
   - Collaborators: PI: Fred Beyette, University of Cincinnati; Subcontract PI: Wenyan Jia
   - Summary: This project aims to develop a wireless EEG system to provide critical point-of-care information about brain electrical activity.

7) CAREER: Evaluating capabilities of neural control in human-machine interaction
   - Agency: NSF

- Grant number: CMMI-0953449
- Level of support: $400K
- Period of support: 7/2010–6/2015
- Role: PI
- Summary: This CAREER award aims to evaluate quantitatively the capabilities of human neural control of movement in human-machine interaction (HMI), where the human operator is viewed as a hybrid neural controller and an information processor.

8) CSR: Medium: Collaborative Research: Static pipelining, an approach for ultra-low power embedded processors
   - Agency: NSF
   - Grant number: NSF CNS-0964079
   - Level of support: $400K (Pitt)
   - Period of support: 5/2010–4/2014
   - Role: PI
   - Collaborators: Allen Cheng (former PI of Pitt, 5/2010–9/2010) and David Whalley (PI of Florida State University)
   - Summary: This project aims to develop a processor design that can avoid wasteful energy consumption aspects of a traditionally pipelined processor while still achieving comparable performance.

9) System identification and modeling approach to characterizing rigidity in Parkinson's disease
   - Agency: Health Future Foundation
   - Level of support: $20K
   - Period of support: 7/2008–6/2010
   - Role: Co-I
   - PI: Rui-Ping Xia, Creighton University
   - Summary: This project aims to differentiate the contributions of the neural and non-neural factors to rigidity in Parkinson's disease (PD).

10) Smart codec with telesurgery capabilities
   - Agency: U.S. Army (SBIR Phase II), subcontract with Energid Technologies Corporation
   - Contract number: W81XWH-07-C-0024
   - Level of support: $40K for subcontract
   - Period of support: 12/2007–11/2009
   - Role: Subcontract PI
   - PI: David Askey, Energid Technologies Corporation; subcontract Co-PI: Heung-No Lee
   - Summary: This project aims to design a smart codec device and algorithm for a telesurgery system that can reliably operate over a wide range of bandwidths and network configurations.

11) Dimensionality reduction in the control of the human hand
   - Agency: NSF
   - Grant number: CMMI-0727256
   - Level of support: $195K
   - Period of support: 9/2007–8/2010
   - Role: PI
   - Co-PIs: Heung-No Lee and Mingui Sun

- Summary: This project aims to characterize the dimensionality reduction in the control of hand movements and to identify the neural control principles underlying the dimensionality reduction.

12) A unified sensor system for ubiquitous assessment of diet and physical activity
    - Agency: NIH, subcontract with UPMC Department of Neurological Surgery
    - Grant number: NIH U01 HL91736-01
    - Level of support: $296K for subcontract
    - Period of support: 8/2007–5/2013
    - Role: Subcontract PI
    - PI: Mingui Sun
    - Summary: This project aims to develop a novel electronic device and a multimedia system for assessment of food intake and physical activity in clinical overweight and obese evaluation.

D.2 Non-Peer-Reviewed Proposals

1) Inverter testing and modeling research
    - Agency: Electric Power Research Institute (EPRI)
    - Level of support: $79K
    - Period of support: 1/2016–12/2016
    - Role: Co-PI
    - PI: Thomas McDermott
    - Summary: The project aims to model photovoltaic (PV) inverter transients and test overvoltage and overcurrent situations in PV inverter operations.

2) Algorithms and applications for cognitive computing systems
    - Agency: Air Force Research Laboratory
    - Level of support: $282K
    - Period of support: 8/2015–2/2018
    - Role: PI
    - Former PI: Yiran Chen (8/2015–4/2017); Co-PI: Hai (Helen) Li
    - Summary: This project aims to develop algorithms and explore applications for cognitive computing systems based on neuromorphic computing and machine learning technology.

3) The design of neuromorphic controller system built with memristor crossbars
    - Agency: Air Force Research Laboratory
    - Level of support: $529K
    - Period of support: 2/2015–9/2017
    - Role: Co-PI
    - PI: Hai (Helen) Li; other Co-PI: Yiran Chen
    - Summary: This project aims to design a neuromorphic computing controller at IBM 130 nm process which can be integrated with real memristor crossbar arrays at board level.

4) Neuromorphic computing engine with resistive crossbar architecture
    - Agency: Air Force Research Laboratory
    - Level of support: $118K
    - Period of support: 9/2014–4/2015
    - Role: Senior Personnel
    - PI: Hai (Helen) Li; Co-PI: Yiran Chen

- Summary: This project aims to realize the brain-inspired computing architecture by combining the flexibility of conventional architecture in computation and the efficiency of the emerging memristor technology.

5) DC-AMPS (Direct Current Architecture for Modern Power Systems)
   - Agency: Henry L. Hillman Foundation
   - Level of support: $400K
   - Period of support: 7/2014–6/2015
   - Role: Co-PI
   - PI: Gregory Reed; other Co-PIs: Thomas McDermott and William Stanchina
   - Summary: This project aims to utilize the newly established Electric Power Systems Laboratory for low-power/bench-scale research and development, testing, and evaluation.

6) Integration of renewables with HVDC under weak AC grid conditions
   - Agency: Siemens Energy, Inc.
   - Level of support: $125K
   - Period of support: 10/2013–9/2014
   - Role: Co-PI
   - PI: Gregory Reed; other Co-PI: Thomas McDermott
   - Summary: This project aims to increase the HVDC system stability by properly coordinating the HVDC controls, wind turbine generators, and SVC PLUS with energy storage.

7) Solar energy integration study and DC infrastructure investigation
   - Agency: Pitt-Ohio Express, Inc.
   - Level of support: $50K
   - Period of support: 8/2013–10/2014
   - Role: Co-PI
   - PI: Gregory Reed; other Co-PI: Thomas McDermott
   - Summary: This project aims to integrate renewables through a DC backbone and into Pitt-Ohio's Harmar facility as a means to promote sustainability.

8) Electric power distribution modeling and simulation for feeder analytics and distributed energy resource integration
   - Agency: FirstEnergy Corporation
   - Level of support: $125K
   - Period of support: 6/2013–8/2014
   - Role: Co-PI
   - PI: Gregory Reed; other Co-PI: Thomas McDermott
   - Summary: This project aims to leverage the data collected on monitored feeders to support analytics for planning, design, and operation of the distribution system.

9) eButton: a wearable electronic device for dementia care
   - Agency: National Collegiate Inventors and Innovators Alliance (NCIIA)
   - Grant number: 10345-13
   - Level of support: $5K
   - Period of support: 4/2013–12/2013
   - Role: Co-I
   - PI: Mingui Sun

- Summary: This project aims to build a portable platform for in-home elder care system using eButton to improve the service quality and reduce the service cost in the meanwhile.

10) HVDC technology development
    - Agency: Mitsubishi Electric Corporation (MELCO)
    - Level of support: $235K
    - Period of support: 4/2013–8/2014
    - Role: Co-PI
    - PI: Gregory Reed; other Co-PIs: Thomas McDermott and William Stanchina
    - Summary: This project aims to provide technical support to MELCO in the following main areas of HVDC technology development: HVDC system modeling, DC fault analysis, DC protection system design, and DC protective relaying schemes.

11) Grid technologies collaborative
    - Agency: National Energy Technology Laboratory (NETL)—Regional University Alliance (RUA), Department of Energy (DOE)
    - Level of support: $850K
    - Period of support: 1/2012–12/2013
    - Role: Co-PI at University of Pittsburgh
    - PI: Gregory Reed; other Pitt Co-PIs: Thomas McDermott and William Stanchina
    - Summary: The activities of the Grid Technologies Collaborative focus on developing an integrated capability to model power electronics components and systems across NETL-RUA member institutions, and outreach and marketing through invited seminars and national workshops.

12) Medium Voltage Direct Current (MVDC) technology development
    - Agency: ABB, Inc.—Corporate Research Center
    - Level of support: $155K
    - Period of support: 1/2011–12/2013
    - Role: Co-PI
    - PI: Gregory Reed; other Co-PI: Thomas McDermott
    - Summary: This proposal aims to develop MVDC technology for applications on the electric grid and for Active Grid Infrastructure (AGI) solutions.

13) Interfaces of electric power and energy research commercialization program
    - Agency: Commonwealth of Pennsylvania—Ben Franklin Technology Development Authority
    - Level of support: $600K
    - Period of support: 1/2011–12/2012
    - Role: Co-PI
    - PI: Gregory Reed; other Co-PIs: George Kusic, Marlin Mickle, and William Stanchina
    - Summary: This project aims to develop novel cross-cutting initiatives to address technical challenges facing the electric power and energy industry sector.

14) Smart grid interface control methodology development for integrated green energy resource management
    - Agency: Westinghouse Electric Company
    - Level of support: $200K
    - Period of support: 1/2010–12/2010
    - Role: Co-PI

- PI: Gregory Reed; other Co-PIs: Robert Boston, Thomas Cain, Marlin Mickle, and William Stanchina
- Summary: This project aims to develop methodologies and concepts of smart grid interface control strategies to better coordinate base load nuclear power with intermittent forms of green energy.

15) Adaptive dynamic programming for optimization of fossil-energy power generation systems
- Agency: National Energy Technology Laboratory (NETL), Department of Energy (DOE)
- Level of support: $171K
- Period of support: 6/2009–9/2011
- Role: PI
- Summary: This project aims to design a stochastic optimization architecture that can facilitate future fossil energy plants to achieve a sustainable balance between efficiency, economics, and environmental performance.

16) Future directions in energy research—technology interfaces of electric power, nuclear, mining engineering
- Agency: Commonwealth of Pennsylvania—Ben Franklin Technology Development Authority
- Level of support: $700K
- Period of support: 1/2009–12/2010
- Role: Co-PI
- PIs: Brian Gleeson and Gregory Reed; other Co-PI: Alex Jones
- Summary: This project aims to leverage the energy-related partnerships and programs established in the Swanson School of Engineering to develop novel cross-cutting initiatives that will significantly contribute to addressing technical challenges facing southwestern Pennsylvania's energy industry.

17) Wireless sensing and control technology
- Agency: Bechtel Marine Propulsion Corporation
- Level of support: $58K
- Period of support: 1/2009–8/2010
- Role: PI
- Summary: This project investigates the feasibility of implementing wireless sensor and control systems for use in time-critical control applications.

E Contributions to Teaching

E.1 Courses Taught over the Past Five Years

Course Name, Level, Number of Credits, and Style	*My Role*	*Year and Semester*	*Number of Students*	*Evaluation Score* (0-5)
ECE 2680: Adaptive Control, graduate-level, 3 credits, lecture	Developer /instructor	Fall 2016	30	4.88
		Spring 2015	41	4.94
		Spring 2014	51	5.00

		Fall 2012	30	4.82
ECE 3650: Optimal Control, Ph.D.-level, 3 credits, lecture	Instructor	Fall 2015	21	5.00
		Fall 2014	27	4.90
		Fall 2013	27	5.00
ECE/ME 2646: Linear System Theory, graduate-level, 3 credits, lecture	Instructor	Fall 2016 (ECE)	53	4.90
		Fall 2016 (ME)	12	4.71
		Fall 2016 (Remote)	1	5.00
		Fall 2015	58	4.90
		Fall 2015 (Remote)	5	5.00
		Fall 2014	55	4.93
		Fall 2013	63	4.92
		Fall 2012	55	4.87
ECE 1673: Linear Control Systems, undergraduate-level, 4 credits, lecture and laboratory	Instructor	Spring 2017	28	4.96
		Spring 2016	32	4.90
		Spring 2015	32	5.00
		Spring 2013	30	4.95
		Spring 2012	33	4.85
Average				4.92

E.2 Classroom Innovations Introduced

Added remote-learning capabilities with web-based class sessions in ECE/ME 2646: Linear System Theory

Encouraged interdisciplinary thinking in the development of engineering courses by building synergistic connections between engineering concepts and biological and medical concepts

Developed a series of IEEE lectures for students and working engineers

E.3 Contributions to Non-Classroom Teaching

(i) Supervised 63 Graduate-Level Independent Engineering Projects (ECE 2998 or 3998) (not including those of my research-track students)

Hsiao-Wei Tung (Spring 2017)
Gaoxiang Zhou (Spring 2017)
Fulei Wang (Spring 2016)
Haokai Xu (Spring 2016)
Xiong Qin (Fall 2015)
Jordan Ott (Summer 2015)
Chaoyuan Ma (Spring 2015)
Matthew Korytowski (Fall 2014)
Cedric Ofakem (Fall 2014)
Brian Fejka (Summer 2014)
Rakshit Kota (Spring 2014)
Sining Wang (Spring 2014)
Bingyang Hu (Fall 2013)
Kalhan Bhan (Spring 2013)
Yiwen Fan (Spring 2013)
Rui Hou (Spring 2013)
Shishir Juluri (Fall 2012)
Robert Kerestes (Spring 2012)
Nicholas Anthony (Spring 2012)
Matiwos Gebre (Spring 2012)
Richard Kephart (Spring 2012)
Himanshu Ropia (Spring 2012)
Samuel Taggart (Fall 2011)
Adam Balawejder (Summer 2011)
Jingyu Dong (Summer 2011)
Chun Xie (Spring 2011)
Ruchi Singh (Fall 2010)
Shuang Su (Fall 2010)
Thomas Barch (Summer 2010)
Jar-Min Lin (Spring 2010)
R. Benjamin Allums (Summer 2009)
Areej Sajjad (Spring 2009)
Dan Wang (Spring 2016)
Yue Wang (Spring 2016)
Guifang Yan (Spring 2016)
Zhenyu Zhang (Fall 2015)
Brennan Vazquez (Summer 2015)
Siyue Cheng (Fall 2014)
Dongqi Liu (Fall 2014)
Xiaochen Zhang (Fall 2014)
Ansel Barchowsky (Spring 2014)
Weiqing Lu (Spring 2014)
Da Zheng (Spring 2014)
Sinan Yigit (Fall 2013)
Heyuxuan Chen (Spring 2013)
Jason Harchick (Spring 2013)
Wang Yao (Spring 2013)
Robert Kerestes (Fall 2012)
Matthew Korytowski (Spring 2012)
Mohamed Diallo (Spring 2012)
Noah Gerber (Spring 2012)
Rinol Pereira (Spring 2012)
Himanshu Ropia (Fall 2011)
Wenchao Xie (Fall 2011)
Denis Cunningham (Summer 2011)
Clifford Luzier (Summer 2011)
Beiru Zhang (Spring 2011)
Ryan Marino (Fall 2010)
Adam Balawejder (Summer 2010)
Andrew Tomaswich (Spring 2010)
Jordan Negley (Spring 2010)
Nicholas Alexiades (Summer 2009)
Nicholas Alexiades (Summer 2008)

(ii) Served on 66 Ph.D. Dissertation Committees

Ismail Bayram (2017)
Enes Eken (2017)
Fei Lan (2017)
Randy Lee (2017)
Jason Pickel (2016)
Xiang Chen (2016)
Mengjie Mao (2016)
Nicholas Kirsch (2016)
David Loucks (2015)
Joshua Dudik (2015)
Brandon Hamschin (2015)
Yujuan Zhao (2015)
Ali Alsuwaiyan (2017)
Paresh Vasandani (2017)
Ansel Barchowsky (2017)
Poovaiah Palangappa (2017)
Andrew Whitford (2016)
Beiye Liu (2016)
Iva Jestrovic (2016)
Ari Pritchard-Bell (2016)
Robert Rasmussen (2015)
Hao Wang (2015)
Wujie Wen (2015)
Luke Solomon (2015)

Vikram Gomatam (2015)
Matthew Korytowski (2014)
Yicheng Bai (2014)
Brandon Grainger (2014)
Danielle Bond (2014)
Azime Can-Cimino (2014)
Jiyong Huang (2013)
Yong Li (2013)
Qixing Liu (2013, Carnegie Mellon U.)
Hussain Bassi (2013)
Ya-Ping Wang (2012)
Qian Chen (2012)
Shugong Wang (2011)
Brian Bucci (2011)
Massimo Cenciarini (2010)
John Kalafut (2010)
Angela Beauford (2009)
Jian Xu (2009)
Tolga Ozkurt (2009)
Arash Mahboobin (2007)
Xiaofei Song (2007)
Patrick Sadtler (2014)
Lina Xu (2014)
Minmin Zhang (2014)
Emmanuel Taylor (2014)
Dinghuan Zhu (2014, Carnegie Mellon U.)
Raghav Khanna (2014)
Robert Kerestes (2013)
Xiangyu Luo (2013)
SangHyun Byun (2013)
Osama Alkishriwo (2013)
Samuel Dickerson (2012)
Xiaoyu Liu (2011)
Seda Senay (2011)
Ning Yao (2010)
Zhanpeng Jin (2010)
Steven Hackworth (2010)
Yuan Sun (2009)
Gregory Okopal (2009)
Cheng-Chun Chang (2008)
Ji Hyun Yang (2007, MIT)
Kazutaka Takahashi (2007, MIT)

(iii) Served on 63 M.S. Thesis Committees

Abdulkarim Alorf (2017)
Amanda Erhard (2017)
Chang Song (2017)
Lucie Broyde (2017)
Matthew Sybeldon (2016)
Etienne Zahnd (2016)
Qiang Zhong (2016)
Xiaocong Du (2016)
Cedric Ofakem (2015)
Xue Wang (2015)
Antoine Dumortier (2015)
Stephen Abate (2015)
Othman Muheialdin (2015)
Patrick Lewis (2014)
Enes Eken (2014)
Hashim Al Hassan (2014)
Iva Jestrovic (2013)
Bo Luan (2013)
Hanrui Huang (2013)
Adam Sparacino (2012)
Emmanuel Taylor (2012)
Yiwen Xu (2012)
Chengliu Li (2011)
Quan Tao (2011)
Shuang Su (2011)
Matthew Korytowski (2011)
Zhengnan Zhang (2010)
Jiachen Mao (2017)
Andrew Bulman (2017)
Hsin-Pai Cheng (2016)
Malia Kelsey (2016)
Alvaro Cardoza (2016)
Tianyi Qiu (2016)
Kent Nixon (2016)
Stephen Whaite (2015)
Zachary Splain (2015)
Arthur Gatouillat (2015)
Augustin Cremer (2015)
Ansel Barchowsky (2014)
Heloise Bleton (2014)
Beiye Liu (2014)
Oreste Scioscia (2013)
Troy Hand (2013, Georgia Tech.)
Joshua Dudik (2013)
Haifeng Xu (2012)
Bin Mao (2012)
Hsin-Ju Chen (2012)
Nicholas Franconi (2012)
Hao Wang (2011)
Robert Kerestes (2011)
Vikram Thiruneermalai Gomatam (2011)
Brandon Grainger (2011)
Joshua Stachel (2010)

Raghav Khanna (2010)
Shimeng Huang (2010)
Yaofeng Yue (2010)
Kingsley Adeoyo (2009)
Mir Mahmood (2008)
Joseph Oresko (2010)
Michael Rothfuss (2010)
Jason Pickel (2009)
Kirsten McCane (2009)
Douglas McConahy (2007)

(iv) Supervised 25 Undergraduate-Level Independent Engineering Projects (ECE/COE 1898)

Fahad Alkanaan (Summer 2017)
Joshua Hinnebusch (Summer 2017)
Michael Ghaben (Spring 2017)
Benjamin Baum (Summer 2013)
Benjamin Dunkelberger (Summer 2012)
Vernon Smith (Summer 2012)
Adam Krug (Summer 2011)
John Hill IV (Fall 2009)
Thomas Cox (Spring 2009)
Jay Johnson (Fall 2008)
Jeffrey Gordon (Fall 2007)
Ephorm Freeman III (Summer 2007)
Aaron Hughes (Fall 2006)
Daniel Ferris (Spring 2017)
Barbara Delgado (Summer 2014)
Brent Hummel (Fall 2012)
James Perkins (Summer 2012)
Hezi Touaf (Summer 2012)
John Hill IV (Spring 2010)
John Hill IV (Spring 2009)
Perry Servedio (Fall 2008)
Julie Kleinman (Fall 2008)
Jeffrey Gordon (Summer 2007)
Aaron Hughes (Spring 2007)
Michael Iezzi (Fall 2006)

(v) Supervised Eight Undergraduate Research Internship Projects

Michael Urich (Summer 2016)
Hamed Safaeian (Summer 2012)
Stephen Albert (Fall 2010)
Michael West (Summer 2008)
Lidong Cai (Summer 2015)
Alvaro Cardoza (Summer 2011)
Michael Sobczak (Summer 2010)
Brian Dicks (Summer 2007)

(vi) Supervised 19 Senior Design Projects

John Maas III, Tanner Slonceski, and Yueqing Zhang (Summer 2017)
Alexander Cheng, Dominic Edwards, and Josh Hinnebusch (Spring 2017)
Fahad Alkanaan and Mitch Anglemyer (Spring 2017)
Eric Bucklen, Rafid Lateef, and Damian Link (Fall 2015)
Barbara Delgado and Brendan Rodgers (Summer 2015)
John Abraham and Brandon Bock (Spring 2015)
Benjamin Baum and Ian Steck (Spring 2013)
Robert Lemmon and Sean Schellinger (Fall 2012)
Opubo Agiobenebo (Spring 2012)
Sean Kelly and Brendan Roberts (Fall 2011)
Jenya DeBenedetti, Dan Rosenberry, and Jeremy Sawyer (Spring 2011)
Daniel Campo, Chris Lippert, and Jessica Stein (Fall 2010)
Frank Cousart, Matthew Perich, and Mark Ressler (Spring 2010)
Keith Bates and Kevin Douglas (Summer 2009)
Seth Ammer and Thaddeus Czauski (Spring 2009)
Jason Jones, Robert McBeth, Kris Nickel, and Albert Oduho (Fall 2008)
Brian De Paul, Joshua Laskey, and David Thurston (Fall 2007)
Aaron Hughes and David Huppman (Fall 2007)
Brian Antoniazzi, Robert Francis, and Pranesh Patel (Spring 2007)

(vii) Supervised 17 Visiting Students

Datian Peng, Ph.D. student, Xi'an Jiaotong University, China, 2016–2017
Longzhao Sun, Ph.D. student, Shanghai Jiao Tong University, China, 2016–2017
Vojislav Bogdanovic, B.S. student, University of Belgrade, Serbia, 2016
Haitao Sun, M.S. student, Carnegie Mellon University, 2016
Xuan Xie, Ph.D. student, Beijing Jiaotong University, China, 2015–2016
Tianjian Yu, Ph.D. student, Central South University, China, 2015–2016
Yating Chen, Ph.D. student, Central South University, China, 2014–2016
Jiafeng Li, Ph.D. student, Beihang University, China, 2014–2015
Jiaojiao Zhu, Ph.D. student, Central South University, China, 2014–2015
Zhi Liu, Ph.D. student, Central South University, China, 2013–2014
Haitian Zhai, Ph.D. student, Northwestern Polytechnical University, China, 2012–2014
Ker-Jiun Wang, M.S. student, Carnegie Mellon University, 2012
Yongquan Yang, Ph.D. student, Ocean University of China, 2010–2011
Michael Budram, Pre-Ph.D. Scholar, University of Maryland, Baltimore County, 2010
Troy Hand, M.S. student, Georgia Institute of Technology, 2010
Zhe Shan, Ph.D. student, Pennsylvania State University, 2009
Antoine Delorme, undergraduate student, Ecole des Mines de Nantes, France, 2007

(viii) Hosted 10 Visiting Scholars

Dr. Zhongmin Cai, Professor, Xi'an Jiaotong University, China, 2017–2018
Dr. Jianhua Xu, Professor, Nanjing Normal University, China, 2017
Dr. Ying Sun, Associate Professor, Hebei University of Technology, China, 2016
Dr. Guang Yang, Lecturer, Beijing Jiaotong University, China, 2015–2016
Dr. Jose Manoel Fernades, Professor, Universidade Federal do Parana, Brazil, 2015
Dr. Xuren Wang, Associate Professor, Capital Normal University, China, 2015–2016
Dr. Wanhui Wen, Associate Professor, Southwest University, China, 2014–2015
Dr. Qi Zhao, Associate Professor, Beihang University, China, 2014–2015
Dr. Ming Li, Associate Professor, Wuhan Textile University, China, 2014–2015
Dr. Pengzhan Chen, Associate Professor, East China Jiaotong University, 2012–2013

(ix) Supervised One High-School Student

Lan Zhang, Horace Greeley High School, Chappaqua, NY, 2014–2017

F Graduate Students

F.1 Ph.D. Students Advised as Major Advisor or Co-Advisor

As Major Advisor:

1) Dr. Qinhao Zhang, graduated in Fall 2015 (co-advisor: Gregory Reed)
   - Source of support: Siemens USA, Mitsubishi Electric Corporation, and Henry L. Hillman Foundation
   - Dissertation: Adaptive control for solar power based DC microgrid system development
   - First employment: Bombardier USA
2) Dr. Shimeng Huang, graduated in Summer 2015 (co-advisor: Gregory Reed)
   - Source of support: NSF Grant CMMI-0953449, ABB, Inc., and teaching assistantship
   - Dissertation: Coordinated control of VSC based multi-terminal DC power grid
   - First employment: ANSYS, Inc.

3) Prof. Jiafeng Xie, graduated in Fall 2014 (co-advisor: Pramod Kumar Meher, Nanyang Technological University, Singapore)
   - Source of support: NSF Grant CNS-0964079, Pitt Central Research Development Fund, and teaching assistantship
   - Dissertation: Novel single and hybrid finite field multipliers over GF(2^M) for emerging cryptographic systems
   - First employment: Assistant Professor at Wright State University
4) Prof. Ibrahem Atawi, graduated in Spring 2013
   - Source of support: Fellowship from the government of Saudi Arabia
   - Dissertation: An advanced distributed control design for wide-area power system stability
   - First employment: Assistant Professor, now Dean of College of Engineering, University of Tabuk, Saudi Arabia
5) Dr. Mircea Lupu, graduated in Spring 2013
   - Source of support: NSF Grants CMMI-0727256 and CMMI-0953449
   - Dissertation: Human manual control as an information processing channel
   - First employment: Emerson Process Management Corporation and Adjunct Professor at University of Pittsburgh
6) Dr. Ang Li, graduated in Fall 2012 (co-advisor: Gregory Reed)
   - Source of support: Commonwealth of Pennsylvania−Ben Franklin Technology Development Authority
   - Dissertation: Control system model for analysis of electricity market bidding process
   - First employment: Siemens USA
7) Prof. Ramana Vinjamuri, graduated in Summer 2008
   - Source of support: NSF Grant CMMI-0727256 and faculty startup fund
   - Dissertation: Dimensionality reduction in control and coordination of the human hand
   - First employment: Postdoctoral fellow at UPMC, now Assistant Professor at Stevens Institute of Technology

As Co-Advisor:

8) Prof. Laura Wieserman, graduated in Fall 2016 (major advisor: Tom McDermott)
   - Source of support: Electric Power Research Institute (EPRI) and teaching assistantship
   - Dissertation: Developing a transient photovoltaic inverter model in OpenDSS using the Hammerstein-Wiener mathematical structure
   - First employment: Assistant Professor at University of Pittsburgh, Johnstown

F.2 Ph.D. Students in Progress

1) Hashim Al Hassan (major advisor: Brandon Grainger)
   - Source of support: Fellowship from the government of Saudi Arabia
   - Research topic: Identification and control of electric power systems
2) Thamer Alharbi
   - Source of support: Fellowship from the government of Saudi Arabia
   - Research topic: Distributed control of networked systems
3) Bojian Cao
   - Source of support: Siemens USA
   - Research topic: Electric motor control

4) Ahmed Dallal (co-advisor: Yiran Chen) (expected to graduate in Summer 2017 and will join University of Pittsburgh as a non-tenure stream assistant professor in Fall 2017)
   - Source of support: NSF Grant CNS-1544578, Air Force Research Lab, and teaching assistantship
   - Research topic: Air traffic control and human-machine systems
5) Eduardo Dos Santos Diniz (co-advisor: Mingui Sun)
   - Source of support: Fellowship from the government of Brazil and NSF Grant CNS-1544578
   - Research topic: Dynamics of neural oscillations
6) Brandon Jennings
   - Source of support: NSF S-STEM GEPS program
   - Research topic: Computing with oscillatory neural networks
7) Ker-Jiun Wang
   - Source of support: Fellowship from the government of Taiwan
   - Research topic: Human-machine systems
8) Chunpeng Wu (major advisor: Yiran Chen)
   - Source of support: NSF Grant CNS-1422057 and Air Force Research Lab
   - Research topic: Machine learning

F.3 Thesis-Track M.S. Students Advised as Major Advisor or Co-Advisor

As Major Advisor:

1) Jian-Yu Shen, graduate in Spring 2017
   - Source of support: Self-supported
   - Thesis: Optimizing power consumption for heart rate monitor application on Android platform
   - First employment: Amazon
2) Sinan Yigit, graduated in Summer 2014 (co-advisor: Gregory Reed)
   - Source of support: Fellowship from the government of Turkey
   - Thesis: Optimal controller design for more-electric aircraft power systems
   - First employment: Pursuing Ph.D. study at Texas A&M University
3) Xiao Li, graduated in Summer 2013
   - Source of support: Self-supported
   - Thesis: Stability analysis and control design for hybrid AC-DC more-electric aircraft power systems
   - First employment: State Grid Corporation of China
4) Qinhao Zhang, graduated in Fall 2012
   - Source of support: Self-supported
   - Thesis: Maximum power point tracking in photovoltaic systems using model reference adaptive control
   - First employment: Continuing Ph.D. study with me (received Ph.D. degree in 2015)
5) Jean-Marc Coulomb, graduated in Fall 2012 (co-advisor: Gregory Reed)
   - Source of support: Ben Franklin Technology Development Authority and teaching assistantship

- Thesis: Stability analysis and optimal control for AC-DC power system with constant power load
- First employment: Electricite de France

6) Benoit de Courreges D'Ustou, graduated in Fall 2012 (co-advisor: Gregory Reed)
   - Source of support: Ben Franklin Technology Development Authority and teaching assistantship
   - Thesis: Optimal control design for multiterminal HVDC
   - First employment: Electricite de France

7) Shama Huda, graduated in Fall 2011
   - Source of support: Teaching assistantship
   - Thesis: Robust low-rank matrix factorization with missing data by minimizing L_1 loss applied to collaborative filtering
   - First employment: Philips Respironics

8) Robert O'Connor, graduated in Fall 2010 (co-advisor: Gregory Reed)
   - Source of support: Ben Franklin Technology Development Authority and Westinghouse
   - Thesis: Benefits of spatial smoothing for the integration of wind power
   - First employment: Continuing Ph.D. study at Aachen Institute for Advanced Study in Computational Science (AICES), RWTH Aachen, Germany

9) Ang Li, graduated in Summer 2010
   - Source of support: Bechtel Marine Propulsion Corporation
   - Thesis: Comparison between model predictive control and PID control for water-level maintenance in a two-tank system
   - First employment: Continuing Ph.D. study with me (received Ph.D. degree in 2012)

10) Mircea Lupu, graduated in Fall 2009
   - Source of support: Subcontract from an Army SBIR-Phase II award
   - Thesis: Human strategies in the control of time critical unstable systems
   - First employment: continuing Ph.D. study with me (received Ph.D. degree in 2013)

11) James Cavanaugh, graduated in Fall 2009
   - Source of support: Bechtel Plant Machinery, Inc.
   - Thesis: The effect of time delay on the human ability to control unstable systems
   - First employment: Bechtel Plant Machinery, Inc.

12) Sushant Tare, graduated in Spring 2009
   - Source of support: Teaching assistantship
   - Thesis: Estimation of stretch reflex contributions of wrist using system identification and quantification of tremor in Parkinson's disease patients
   - First employment: ATI Allegheny Ludlum

13) Kyle Treleaven, graduated in Fall 2007
   - Source of support: Faculty startup fund and teaching assistantship
   - Thesis: Conflict resolution and traffic complexity of multiple intersecting flows of aircraft
   - First employment: Pursuing Ph.D. study at Massachusetts Institute of Technology

14) Christopher Sprague, graduated in Fall 2007
   - Source of support: Faculty startup fund and Pitt Central Research Development Fund
   - Thesis: System identification of wrist stiffness in Parkinson's disease patients
   - First employment: Bechtel Marine Propulsion Corporation

As Co-Advisor:

15) Brian Doll, graduated in Spring 2015 (major advisor: Nitin Sharma)
    - Source of support: Westinghouse
    - Thesis: Optimization of neuromuscular electrical stimulation to reduce muscle fatigue during isometric contractions
    - First employment: Westinghouse

F.4 Thesis-Track M.S. Students in Progress

1) Jianan Jian, expected to graduate in Fall 2017
    - Source of support: NSF Grant CNS-1544578 and teaching assistantship
    - Research topic: Human-machine systems
2) Valent Paquin, expected to graduate in Fall 2017
    - Source of support: NSF Grant CNS-1544578 and teaching assistantship
    - Research topic: Dynamics of human sleep

F.5 M.B.A./M.S. Joint Degree Students Advised as M.S. Advisor

1) Andrew Snyder, graduated in Summer 2015 (M.B.A. advisor: Rabikar Chatterjee)
    - Project: Training program for optimization of the use of automation in crane operation
2) Nicholas Patino, graduated in Fall 2014 (M.B.A. advisor: Rabikar Chatterjee)
    - Project: Developing and commercializing brain-machine interface neuroprostheses
3) Jonathan Baisch, graduated in Spring 2013 (M.B.A. advisor: Rabikar Chatterjee)
    - Project: The online monitoring system
4) B. Alexander Huber, graduated in Spring 2013 (M.B.A. advisor: Rabikar Chatterjee)
    - Project: Algorithm for enhanced loading pass reduction in cold rolling application with high product variation

F.6 Non-Thesis Track M.S. Students Advised as Academic Advisor

1) Jingyu Wu, graduated in Spring 2017
2) Xiong Qin, graduated in Spring 2016
3) Yue Wang, graduated in Spring 2016
4) Zhenyu Zhang, graduated in Spring 2016
5) David Bobish, graduated in Fall 2015
6) John Cosnek, graduated in Summer 2015
7) Jared Niehenke, graduated in Summer 2015
8) Benjamin Skrypski, graduated in Summer 2015
9) Chaoyuan Ma, graduated in Spring 2015
10) Sining Wang, graduated in Spring 2015
11) Siyue Cheng, graduated in Fall 2014
12) Chuhan Min, graduated in Fall 2014
13) Jessica Burger, graduated in Spring 2014
14) Bingyang Hu, graduated in Spring 2014
15) Nathan Rabenold, graduated in Spring 2014
16) Yiwen Fan, graduated in Fall 2013
17) Denis Cunningham, graduated in Summer 2013
18) Daniel Stough, graduated in Fall 2012

19) Samuel Taggart, graduated in Fall 2012
20) Nicholas Cormas, Jr., graduated in Fall 2011
21) Thomas Barch, graduated in Fall 2011
22) Nicholas Alexiades, graduated in Fall 2010
23) Justin Mason, graduated in Fall 2009
24) Scott Szymanski, graduated in Fall 2009
25) R. Benjamin Allums, graduated in Summer 2009
26) Erica Reinsel, graduated in Summer 2009

G Honors and Awards

Chancellor's Distinguished Teaching Award, University of Pittsburgh, 2016

William Kepler Whiteford Faculty Fellowship, University of Pittsburgh, 9/2012−8/2015 and 9/2015−8/2019 (renewed)

Outstanding Service Award as Associate Editor, IEEE Transactions on Intelligent Transportation Systems, 2013

Coauthored a paper (with Raghav Khanna, Andrew Amrhein, William Stanchina, and Gregory Reed) winning APEC Technical Presentation Award (presenter: Raghav Khanna) in IEEE Applied Power Electronics Conference (APEC), 2013

Certificate of Appreciation for Outstanding Service, IEEE Computer Society, 2011

Andrew P. Sage Best Transactions Paper Award (with Ji Hyun Yang, Louis Tijerina, Tom Pilutti, Joseph Coughlin, and Eric Feron), IEEE Systems, Man and Cybernetics Society, 2010

NSF Faculty Early Career Development (CAREER) Award, 2010

Certificate of Appreciation for Outstanding Service, IEEE Computer Society, 2010

Outstanding Educator Award, Swanson School of Engineering, University of Pittsburgh, 2009

Certificate of Appreciation for Outstanding Service, IEEE Computer Society, 2006

Medical Engineering and Medical Physics Fellowship, Harvard-MIT Division of Health Sciences and Technology, 2003

Zakhartchenko Fellowship, Massachusetts Institute of Technology, 2001 and 2002 (renewed)

David and Beatrice Yamron Fellowship, Harvard-MIT Division of Health Sciences and Technology, 2000

Outstanding Thesis Award, Tsinghua University, 1999

Outstanding M.Eng. Graduate, Tsinghua University, 1998

Outstanding B.Eng. Graduate, Tsinghua University, 1995

H Professional Service & Leadership Activities

H.1 Positions of Leadership in Department/School Committees

Chair, Technical Area Committee on Signals and Systems, Department of ECE, 2015–present

Chair, Outstanding Educator Award Committee, Swanson School of Engineering, 2010

H.2 Positions of Leadership in Professional Society Committees

Co-Chair, Pittsburgh Chapter of IEEE Engineering in Medicine and Biology Society, 1/2006–5/2012

Co-Chair, Pittsburgh Joint Chapter of IEEE Signal Processing Society and Control Systems Society, 9/2010–12/2012

H.3 Conferences Organized and/or Chaired

Program Chair, the 6th International IEEE Conference on AI and Mobile Services (AIMS 2017), Honolulu, HI, USA, 6/25−6/30/2017

Co-Chair of Ph.D. Symposium, joint conferences of (i) the 10th IEEE International Conference on Services Computing, (ii) the 11th IEEE International Conference on Web Services, (iii) the 9th IEEE World Congress on Services, (iv) the 6th IEEE International Conference on Cloud Computing, (v) the 2nd IEEE International Congress on Big Data, and (vi) the 2nd IEEE International Conference on Mobile Services, Santa Clara, CA, USA, 6/27−7/2/2013

Session Chair, the 15th International IEEE Conference on Intelligent Transportation Systems (ITSC 2012), Anchorage, AK, USA, 9/16−9/19/2012

Co-Chair of Ph.D. Symposium, joint conferences of (i) the 9th IEEE International Conference on Services Computing, (ii) the 10th IEEE International Conference on Web Services, (iii) the 8th IEEE World Congress on Services, (iv) the 5th IEEE International Conference on Cloud Computing, (v) the 1st IEEE International Congress on Big Data, and (vi) the 1st IEEE International Conference on Mobile Services, Honolulu, HI, USA, 6/24−6/29/2012

Co-Chair of Ph.D. Symposium, joint conferences of (i) the 8th IEEE International Conference on Services Computing, (ii) the 9th IEEE International Conference on Web Services, (iii) the 7th IEEE World Congress on Services, and (iv) the 4th IEEE International Conference on Cloud Computing, Washington, DC, USA, 7/4−7/9/2011

Chair of Ph.D. Symposium, joint conferences of (i) the 7th IEEE International Conference on Services Computing, (ii) the 8th IEEE International Conference on Web Services, (iii) the 6th IEEE World Congress on Services, and (iv) the 3rd IEEE International Conference on Cloud Computing, Miami, FL, USA, 7/2010

Chair of Work-in-Progress Program, the 5th IEEE International Conference on Services Computing, Honolulu, HI, USA, 7/2008

Co-Chair of Work-in-Progress Program, the 4th IEEE International Conference on Services Computing, Salt Lake City, UT, USA, 7/2007

Chair of Work-in-Progress Program, the 3rd IEEE International Conference on Services Computing, Chicago, IL, USA, 9/2006

H.4 Journal Editorships or Journal Editorial Board Service

Associate Editor, IEEE Transactions on Human-Machine Systems, 2/2013–present

Associate Editor, IEEE Transactions on Intelligent Transportation Systems, 7/2011–present

Guest Co-Editor (with Ramana Vinjamuri), Frontiers in Bioengineering and Biotechnology, Section: Bionics and Biomimetics, Special Topic on Applications of Synergies in Human Machine Interfaces, 2015

Guest Co-Editor (with Heung-No Lee), EURASIP Journal on Wireless Communications and Networking, Special Issue on Network Coding for Wireless Networks, 2010

I Contributions to Diversity

Ph.D. Advisor for:

Eduardo Diniz (Hispanic student) (co-advisor: Mingui Sun)
Brandon Jennings (African American student)
Iheanyi Umez-Eronini (African American student) (co-advisor: Alex Jones)
Laura Wieserman (female student), graduated in Fall 2016 (major advisor: Thomas McDermott)
Shimeng Huang (female student), graduated in Summer 2015 (co-advisor: Gregory Reed)

M.S. Advisor for:

Jingyu Wu (female student), graduated in Spring 2017
Jianyu Shen (female student), graduated in Spring 2017
Yue Wang (female student), graduated in Spring 2016
Siyue Cheng (female student), graduated in Fall 2014
Chuhan Min (female student), graduated in Fall 2014
Jessica Burger (female student), graduated in Spring 2014
Yiwen Fan (female student), graduated in Fall 2013
Shama Huda (female student), graduated in Fall 2011
Erica Reinsel (female student), graduated in Summer 2009

Other Contributions to Diversity:

Advisor of Alvaro Cardoza (Hispanic student), Pitt EXCEL Program, 2011
Advisor of Michael Budram (African American student), Pre-Ph.D. Scholar Program, 2010
Guest Lecturer, Summer Engineering Academy, Pitt EXCEL Program, 2010
Advisor of Michael West (African American student), Pitt EXCEL Program, 2008