Marvin H. Cheng

hmcheng@ieee.org
812-371-9655
http://orcid.org/0000-0001-7908-3635
https://marvin-cheng.github.io/

Professional Activities

Center for Disease Control and Prevention (CDC) / National Institute for Occupational Safety and Health (NIOSH)

- **Coordinator**, Center for Occupational Robotics Research (CORR), 08/2024 – present.
- **Assistant Coordinator**, Center for Occupational Robotics Research, 01/2022 – 07/2024.
- **Team Lead**, the Safety Controls Team (SCT) in the Protective Technology Branch/Division of Safety Research, 04/2021 – present.
- **Research General Engineer**, the Safety Controls Team (SCT), 09/2018 – present.
- **ANSI/A3 Standard Committee Member**, Association of Advancing Automation, 07/2020 – present.
  - Safety Requirements for Industrial Robots and Robot Systems, ANSI/A3 R15.06.
  - Safety Requirements for Industrial Mobile Robots and Robot Systems, ANSI/A3 R15.08.

Networking and Information Technology Research and Development (NITRD) Program

- **Co-Chair,** the Intelligent Robotics and Autonomous Systems (IRAS) Interagency Working Group (IWG) 07/2024 – present.

Embry-Riddle Aeronautical University

- **Associate Professor**, the Department of Engineering, 08/2017 – 09/2018.
- **Adjunct Associate Professor of Embry-Riddle Aeronautical University**, 10/2018 – 12/2023.

West Virginia University

- **Assistant Professor**, the Department of Mechanical and Aerospace Engineering, 08/2010 – 05/2017.
- **Adjunct Professor**, the Department of Mechanical, Material and Aerospace Engineering, 08/2018 – current.

Georgia Southern University

- **Assistant Professor**, Director of Mechatronics and Measurement Lab, the Department of Mechanical Engineering, 08/2006 – 07/2010.

Education

Purdue University, West Lafayette, Indiana, December 2005
Ph.D. Mechanical Engineering

National Sun Yat-Sen University, Kaohsiung, Taiwan June 1996
Master of Mechanical Engineering

National Sun Yat-Sen University, Kaohsiung, Taiwan June 1994
Bachelor of Mechanical Engineering

Other Professional Experience

- **Indiana Research Institute,** Senior Control Engineer, Columbus, Indiana, 01/2006 – 06/2006.
- **National Synchronous Radiation Research Center,** Research Engineer, Hsinchu, Taiwan, 09/1997 – 07/1999.
- **Industrial Development Bureau,** Instructor of Industrial Training Course, Taiwan, 03/1997.
- **Industrial Technology Research Institute,** Research Engineer, Hsinchu, Taiwan, 08/1996 – 09/1997.

Other Academic Experience

Teaching Assistant, Purdue University, West Lafayette, Indiana, 08/2000 – 12/2005.

- Develop lab material in the following courses: Dynamics, System Modeling, Digital Control, and Mechatronics.

Research Assistant, Purdue University, West Lafayette, Indiana, 08/1999 – 08/2005.

- Develop algorithms of adaptive sampling for fast atomic force microscopy sampling.
- Conduct research on innovative motion sensor used for diagnosis of hydraulic pump.
- Conduct research on controller implementation with limitation of finite wordlength.

Research Assistant, Purdue University, West Lafayette, Indiana, 08/2004 – 08/2005.

- Develop the evaluating and training system of Oral English Proficiency Program for instructors in the Department of English.

Grants and Funded Research

- *Development of Efficient Path-Planning Algorithms for Drone Swarms in Construction Site Safety Monitoring*, the National Occupational Research Agenda (NORA) grant, $45,000, 2025, with H. Camargo, Co-PI.
- *Enhancing Worker Safety and Efficiency in Human-Robot Collaboration through Machine Learning*, the Nanotechnology Research Center (NTRC) Emerging Technologies Pilot Projects grant, $40,000, 2024, PI.
- *Smart Masonry Robot for Struck-by Hazard Prevention*, the National Occupational Research Agenda (NORA) grant, $200,000, 2023 ~ 2027, with C.-J. Liang, PI.
- *Modeling Collision of Human-Robot Interaction in a Collaborative Workspace*, the National Institute for Occupational Safety and Health, $18,000, 2023, PI.
- *Laboratory Modernization*, the National Institute for Occupational Safety and Health, $56,217, 2023, PI.
- *Investigation on Safety and Trust When Working Alongside Industrial Mobile Robots*, the National Occupational Research Agenda (NORA) grant, $200,000, 2022 ~ 2026, with J. Haney, Co-PI.
- *Air-Bubble Cushioning Liners to Improve Construction Helmet Shock Performance*, the National Occupational Research Agenda (NORA) grant, $200,000, 2022 ~ 2026, with C. Pan, Co-PI.
- *Evaluation of Mobile Robot Safety and Human-Robot Interaction in Workspace*, the National Institute for Occupational Safety and Health, $25,000, 2022, with J. Haney, Co-PI.

- *Smart Path Planning of Collaborative Robots for Worker Safety*, the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention (CDC), $192,000, 2019 ~ 2023, PI.
- *Improving Driver Vehicle Interface (DVI) in Police Cruisers for Operational Safety*, the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention (CDC), $200,000, 2019 ~ 2023, with J. Guan, Co-PI.
- *Improving Safety of Human-Robot Interaction*, the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention (CDC), $200,000, 2018 ~ 2022, with H. Choi and J. Haney, Co-PI.
- *Contact Avoidance between Human Workers and Collaborative Robots*, the National Institute for Occupational Safety and Health 2019, $47,500. PI.
- *Development of Mobile Robots for Student Competition Teams*, Argosy Research Inc., 2018, $34,482 (NTD$1,000,000). PI.
- *Development of Robotic Device with Virtual Interaction between Patients and Occupational Therapist*, Ministry of Science and Technology, Taiwan, 2018, $25,862 (NTD$750,000). PI.
- *Long Term Monitoring of Power Usage*, Industrial Technology Research Institute, 2017, $20,270. PI.
- *Ethanol Engine Emission Testing*, Orthman Energy LLC, 2017, with H. Li and S. Wayne, $30,000. Co-PI.
- *NASA's Centennial Challenges: Sample Return Robot Challenge*, NASA, 2016, with Y. Gu and J. Gross, $750,000, Co-PI.
- *Spatial Resolution Enhancement Method for Sensor Array*, 2016 PICOTEST Co., Ltd., $20,000, PI.
- *Direct Write Technology of Lead-Free Energy Harvesting Array*, 2016 Moldex3D Co., Ltd., $20,000, PI.
- *NASA's Centennial Challenges: Sample Return Robot Challenge*, NASA, 2015, with Y. Gu and J. Gross $100,000. Co-PI.
- *Development of Wearable Robotic System with Human Motions*, 2014 West Virginia EPSCoR Seed Grant, $19,938. PI.
- *NASA's Centennial Challenges: Sample Return Robot Challenge*, NASA, 2014, with Y. Gu, $7,000. Co-PI.
- *Synthetic Skin for Pressure and Strain Sensing with Energy Harvesting*, 2013 West Virginia EPSCoR Seed Grant, $20,000. PI.
- *Development of energy harvester of piezoelectric device with adjustable resonant frequency*, 2012 WVU Senate Grant, $11,740. PI.
- *Synthetic Skin for Pressure and Strain Sensing with Energy Harvesting for Aircrafts*, 2012 West Virginia EPSCoR Seed Grant, $15,000. PI.
- *Professional Development Grant*, 2009, Georgia Southern University, $1,880. PI.
- *Vibration Measurement of Piezo-cantilever Beam*, 2009, Paulson Technology Research Awards, $5,023. PI.
- *Robotic Ink Jet Printing*, 2008 Paulson Technology Research Awards, $1,195. PI.

- *Development of Instruction Competition*, 2007, Georgia Southern University, $17,634. PI.
- *Professional Development Grant*, 2007, Georgia Southern University, $2,025. PI.
- *Diagnosis of Pump Systems for High Power Engine*, 2006, Cummins, $45,000. PI.
- *Networking Controller for Fan Coil Systems*, 1997, Industrial Development Bureau, Taiwan, $46,138. PI.
- *Advanced Control of Indoor Air Quality Monitoring System*, 1997, Bureau of Energy, Ministry of Economic Affairs, Taiwan, with H.C. Chiang, H.C. L, and K.S. Yang, $109,375. Co-PI.
- *Development of Networking Controller for HVAC System*, 1996, Industrial Technology Research Institute, Taiwan, $61,538. PI.

Journal Articles

1. Howard, J., Murashov, V., Carr, J., Cheng, M., Earnest, G.S., Elliott, K.C., Haas, E.J., Petery, G., Reid, C.R., Spielholz, P.O., Srinivasan, D., Trout, D., Liang, C.-J., Roth, G., & Wendt, C.D. (2025). Industrial Robotics and the Future of Work. *American Journal of Industrial Medicine*. DOI: 10.1002/ajim.23729.
2. Cheng, M. H., Haney, J., Cheng, A. C. & Davis, L. (submitted). Emotion Recognition in Pets Through Household Service Robots. *Biomimetics*.
3. Cheng, M. H. & Cheng, A. Y. (submitted). Vision-Based Detection and Motion Planning for Robotic Pollination Systems. *Robotics*.
4. Cheng, M. H., Shisheie, R., Huang, P.-L, Chu, H.-C., & Bakhoum, E. G. (submitted). Development of Assistive Exoskeleton System Used for Rehabilitation and Occupational Therapy. *IEEE/ASME Transactions on Mechatronics*.
5. Cheng, M. H., Huang, P.-L, & Chu, H.-C. (2024). Bio-Inspired Motion Emulation for Social Robots: A Real-Time Trajectory Generation and Control Approach. *Biomimetics*, 9(9), 557.
6. Cheng, M. H., Guan, J., Dave, H. K., White, R. S., Whisler, R. L., Zwiener, J. V., Camargo, E. H., & Current, R. S. (2024). Designing an Experimental Platform to Assess Ergonomic Factors and Distraction Index in Law Enforcement Vehicles during Mission-Based Routes. *Machines,* 12(8), 502.
7. Cheng, M. H., Camargo, H., & Bakhoum, E. G. (2024). Developing a Cyber-Physical Rehabilitation System for Virtual Interaction between Patients and Occupational Therapists. *PrePrints*.
8. Liang, C.-J., Le, T.-H., Ham, Y., Mantha, B. R. K., Cheng, M. H., & Lin, J. J. (2024). Ethics of Artificial Intelligence and Robotics in the Architecture, Engineering, and Construction Industry. *Automation in Construction*, 162, 105369.
9. Cheng, M. H., Li, Y., Camargo, H., & Bakhoum, E. G. (2023). Sustainable Energy Harvesting Mechanism with Flow-Induced Vibration. *Machines*, 11(9), 902.
10. Liang, C.-J., & Cheng, M. (2023). Trends in Robotics Research in Occupational Safety and Health: A Scientometric Analysis. *International Journal of Environmental Research and Public Health*, 20(10), 5904.

11. Chen, C.-Y., Cheng, M.-H., Cheng, M., & Yang, C.-F. (2023). Using iBeacon Components to Design and Fabricate Low-Energy and Simple Indoor Positioning Method. *Sensors and Materials*, 35(3), 703-722.
12. Bakhoum, E. G., & Cheng, M. H. (2022). Direct Detection of Alpha Particles with Solid-State Electronics. *The Physics Teacher*, 60(8), 681-683.
13. Bakhoum, E., & Cheng, M. H. (2018). 3-axis, Ultrahigh-Sensitivity, Miniature Acceleration Sensor. *IEEE Transactions on Components, Packaging and Manufacturing*, 8(2), 244-250.
14. Gu, Y., Ohi, N., Lassak, K., Strader, J., Kogan, L., Hypes, A., Harper, S., Hu, B., Gramlich, M., Kavi, R., Watson, R., Cheng, M., & Gross, J. (2018). Cataglyphis: An Autonomous Sample Return Rover. *Journal of Field Robotics*, 35(2), 248-274.
15. Bakhoum, E., Cheng, M. H., & Kyle, R. A. (2016). Low-Cost, High-Accuracy Method and Apparatus for Detecting Meat Spoilage. *IEEE Transactions on Instrumentation and Measurement*, 65(7), 1707-1715.
16. Jiang, L., Li, Y., & Cheng, M. H. (2016). Compensation for Cross-Coupled Dynamics of Dual Twisted-String Actuation Systems. *Journal of Control Science and Engineering*, 2016, Article ID 5864918.
17. Cheng, M. H., Flores De Jesus, K., Cronin, S. D., Sierros, K. A., & Bakhoum, E. (2015). A Versatile Spatial Resolution Enhancement Method for Data Acquisition. *Measurement Science and Technology*, 26(4), 045901.
18. Flores De Jesus, K., Cheng, M. H., Jiang, L., & Bakhoum, E. (2015). Resolution Enhancement Method Used for Force Sensing Resistor Array. *Journal of Sensors*, 15, Article ID 647427.
19. Bakhoum, E. G., & Cheng, M. H. (2015). Ultraminiature Angular Position Sensor Based on the Beta-Voltaic Principle. *IEEE Transactions on Instrumentation and Measurement*, 64(2), 533-540.
20. Bakhoum, E. G., & Cheng, M. H. (2015). High-Accuracy Miniature Dew Point Sensor and Instrument. *IEEE Sensors Journal*, 15(3), 1482-1488.
21. Cheng, M. H., Li, Y., & Bakhoum, E. G. (2014). Controller Synthesis of Tracking and Synchronization for Multi-Axis Motion System. *IEEE/ASME Transactions on Control System Technology*, 22(1), 378-386.
22. Bakhoum, E. G., Cheng, M. H., & Van Landingham, K. M. (2014). Alpha-Particle-Based Icing Detector for Aircraft. *IEEE Transactions on Instrumentation and Measurement*, 63(1), 185-191.
23. Bakhoum, E. G., & Cheng, M. H. (2014). Advanced Optical Microphone. *IEEE Sensors Journal*, 14(1), 7-14.
24. Bakhoum, E. G., & Cheng, M. H. (2013). Tunable Ultracapacitor. *IEEE Transactions on Industrial Electronics*, 60(12), 5313-5619.
25. Cheng, M. H., Chiu, G. T.-C., & Franchek, M. (2013). Real-Time Measurement of Eccentric Motion with Low-Cost Capacitive Sensor. *IEEE/ASME Transactions on Mechatronics*, 18(3), 990-997.
26. Bakhoum, E. G., & Cheng, M. H. (2013). Miniature Carbon Monoxide Detector Based on Nanotechnology. *IEEE Transactions on Instrumentation and Measurement*, 62(1), 240-245.

27. Bakhoum, E. G., & Cheng, M. H. (2012). Novel Electric Micromotor for Consumer Electronics Applications. *IEEE Transactions on Consumer Electronics*, 58(4), 1103-1109.
28. Bakhoum, E. G., & Cheng, M. H. (2012). MEMS Acceleration Sensor with Large Dynamic Range and High Sensitivity. *IEEE Journal of Microelectromechanical Systems*, 21(5), 1043-1048.
29. Cheng, M. H., Guo, G., Banta, L. E., & Bakhoum, E. (2012). Identification of Arm Locomotion and Controller Synthesis for Assistive Robotic Systems. *ICIC Express Letter*, 6(10), 2659-2665.
30. Bakhoum, E. G., & Cheng, M. H. (2012). Miniature Moisture Sensor Based on Ultracapacitor Technology. *IEEE Transactions on Components, Packaging and Manufacturing Technology*, 2(7), 1151-1157.
31. Bakhoum, E. G., & Cheng, M. H. (2012). Frequency-Selective Seismic Sensor. *IEEE Transactions on Instrumentation and Measurement*, 61(3), 823-829.
32. Cheng, M. H., Li, Y. J., Sabolsky, E. M., & Chen, C. Y. (2011). Energy Harvesting Device with Adjustable Resonance Frequency. *ICIC Express Letter*, 5, 3315-3320.
33. Cheng, M. H., Li, Y. J., Chen, C. Y., & Goforth, F. (2011). Modeling of Piezoelectric Energy Harvester with Adjustable Resonant Frequency. *International Journal of Intelligent Technologies and Engineering Systems*, 1, 86-92.
34. Cheng, M. H., Chen, C.-Y., & Bakhoum, E. G. (2011). Synchronization Controller Synthesis of Multi-Axis Motion System. *International Journal of Innovative Computing, Information and Control*, 7(7), 4395-4410.
35. Bakhoum, E. G., & Cheng, M. H. (2011). Novel Electret Microphone. *IEEE Sensors Journal*, 11(4), 988-994.
36. Soloiu, V. A., Cheng, M. H., & Chen, C. Y. (2010). Analytic Solution of Shock Waves Equation with Higher Order Approximation. *Innovative Computing, Information and Control – Express Letters*, 4(5)(B), 1723-1728.
37. Chen, C. Y., & Cheng, M. H. (2010). Backstepping Controller Design for a Manipulator with Compliance. *Innovative Computing, Information and Control – Express Letters*, 4(5)(A), 1991-1996.
38. Chen, C. Y., & Cheng, M. H. (2010). Open Architecture Design of Embedded Controller for Industrial Communication Gateway. *ICIC – Express Letters: Part B*, 1(1), 51-56.
39. Cheng, M. H.-M., & Bakhoum, E. G. (2010). A Simplified Approach of Wordlength Estimation for Digital Controllers in State-Space Representation. *Innovative Computing, Information and Control – Express Letters*, 4(4), 1295-1300.
40. Bakhoum, E. G., & Cheng, M. H.-M. (2010). Experiment for Teaching a Fundamental Principle in Electrostatics. *Journal of Electrostatics*, 68(3), 249-253.
41. Bakhoum, E. G., & Cheng, M. H.-M. (2010). Novel Capacitive Pressure Sensor. *IEEE Transactions on Microelectromechanical Systems*, 19(3), 443-450.
42. Bakhoum, E. G., & Cheng, M. H.-M. (2010). Capacitive Pressure Sensor with Very Large Dynamic Range. *IEEE Transactions on Components and Packaging Technologies*, 33(1), 79-83.
43. Lee, J., & Cheng, M. H.-M. (2010). Psychophysical Measurement of Perceptual Sensitivity to Pitch Variations. *Innovative Computing, Information and Control – Express Letters*, 4(1), 1-6.

44. Cheng, M. H.-M., & Chiu, G. T.-C. (2010). A Mechatronic Approach to a Virtual Laboratory Service on the Internet. *International Journal of Virtual Technology and Multimedia*, 1(2), 140-154. (doi: 10.1504/IJVTM.2010.032057)
45. Cheng, M. H.-M., Chen, C.-Y., Bakhoum, E. G., & Mitra, A. (2009). Controller Synthesis with the Consideration of Multi-Resolution. *Innovative Computing, Information and Control – Express Letters*, 3(4)(A), 1025-1030.
46. Chen, C.-Y., & Cheng, M. H.-M. (2009). Adaptive Robust Sensorless Position Control of Integrated Moving Coil Motor and Flexure Mechanism. *Innovative Computing, Information and Control – Express Letters*, 3(3)(A), 445-450.
47. Cheng, M. H.-M., Chiu, G. T.-C., & Reifenberger, R. (2008). Fractal Compression and Adaptive Sampling: Reducing the Image Acquisition Time in Scanning Probe Microscopy. *Scanning*, 30(6), 463-473. (doi: 10.1002/sca.20131)
48. Cheng, H.-M. (2008). Digital Controller Synthesis with Restricted Resolution. *Journal of Computers*, 3(4), 45-50.
49. Cheng, H.-M. (2007). A New Approach to Estimate the Required Wordlength of Digital Controller. *ASME Early Career Technical Journal*, 6(1), 31-38.
50. Cheng, H.-M., & Chiu, G. T.-C. (2005). Theory and Implementation of Finite Precision Controller – Limitation on Sample Rate and Wordlength. *Mechanical Engineering Monthly (Chinese)*, (354), 1-10.
51. Cheng, H.-M., Ewe, M. T.-S., Bashir, R., & Chiu, G. T.-C. (2001). Modeling and Control of Piezoelectric Cantilever Beam Micro-Mirror and Micro-Laser Array to Reduce Image Banding in Electrophotographic Processes. *Journal of Micromechanics and Microengineering*, 11, 487-498.

Conference Articles

1. Cheng, M. H. & Liang, C.-J. (accepted). Adaptive Fractal Quadtree Approach for Efficient Drone-Based Construction Site Safety Inspection. In *The 42ed International Symposium on Automation and Robotics in Construction – ISARC 2025*.
2. Cheng, M., Camargo, H. C., & Haney, J. (2024). Enhancing Safety in Collaborative Workspaces: Defining Attention and Avoidance Zones Through Path Planning with Mobile Robotic Systems. In *2024 ASME International Mechanical Engineering Congress & Exposition (IMECE2024)*, IMECE2024-145014, Portland, OR, November 17-21, 2024.
3. Cheng, M., Liang, C.-J., & Dominguez, E. G. (2024). Safe Operations of Construction Robots on Human-Robot Collaborative Construction Sites. In *The 41st International Symposium on Automation and Robotics in Construction – ISARC 2024*, pp. 9-16, Lille, France, June 3-7, 2024.
4. Cheng, M., Liang, C.-J., McKenzie, E. A., & Dominguez, E. G. (2023). Identification of Contact Avoidance Zones of Robotic Devices in Human-Robot Collaborative Workspaces. In *The 3rd Modeling, Estimation and Control Conference (MECC 2023)*, Lake Tahoe, NV, October 2-5, 2023.
5. Cheng, M., & Bakhoum, E. (2021). Tracking Control Design and Implementation of Multiaxial Controller for Social Robotic Device. In *2021 ASME International Mechanical Engineering Congress & Exposition (IMECE2021)*, IMECE2021-70510, Virtual Conference, November 1-4, 2021.

6. Chen, C.-Y., Cheng, M. H., Cheng, M.-H., & Chen, S.-H. (2021). A Simple Indoor Positioning Method Using Low Energy iBeacon Components. In *The 4th Eurasian Conference on Educational Innovation 2021 (ECEI 2021)*, Taitung, Taiwan, February 5-7, 2021.
7. Cheng, M. H., Huang, P.-L., & Chu, H.-C. (2019). Motion Estimation and Path Planning for Assistive Robotic Devices. In *2019 ASME International Mechanical Engineering Congress & Exposition (IMECE2019)*, IMECE2019-12296, Salt Lake City, UT, November 8-14, 2019.
8. Cheng, M., Huang, P.-L., Chu, H.-C., & Peng, L.-H. (2018). Virtual Interaction between Patients and Occupational Therapist. In *2018 ASME International Mechanical Engineering Congress & Exposition (IMECE2018)*, IMECE2018-87289, Pittsburgh, PA, November 9-15, 2018.
9. Cheng, M., Jiang, L., Wheeler, S., Shisheie, R., Banta, L., & Bakhoum, E. (2016). Design, Fabrication, and Control of a Twisted-String Actuated Robotic Device. In *2016 American Control Conference*, pp. 1215-1220, Boston, MA, July 6 – 8, 2016.
10. Shisheie, R., Jiang, L., Banta, L., & Cheng, M. (2015). Modeling and Control of a Bidirectional Twisted-String Actuation for an Upper Arm Robotic Device. In *2015 American Control Conference*, pp. 5794-5799, Chicago, IL, July 1 – 3, 2015.
11. Jiang, L., Shisheie, R., Cheng, M., & Bakhoum, E. (2015). Controller Synthesis for Assistive Robotic Device Using Twisted-String Actuation. In *2015 American Control Conference*, pp. 2248-2253, Chicago, IL, July 1 – 3, 2015.
12. Li, Y. J., Cheng, M. H., & Chen, C.-Y. (2013). Operating Energy Harvesting Array at Higher Vibration Modes. In *The 2nd International Conference on Intelligent Technologies and Engineering Systems (ICITES 2013)*, Kaohsiung, Taiwan, December 2013.
13. Shisheie, R., Jiang, L., Banta, L., & Cheng, M. H. (2013). Design and Fabrication of an Assistive Device for Arm Rehabilitation Using Twisted String System. In *The 9th annual IEEE International Conference on Automation Science and Engineering (IEEE CASE 2013)*, Madison, WI, August 17-21, 2013.
14. Jiang, L., Shisheie, R., Cheng, M. H., Banta, L., & Guo, G. (2013). Moving Trajectories and Controller Synthesis for an Assistive Device for Arm Rehabilitation. In *The 9th annual IEEE International Conference on Automation Science and Engineering (IEEE CASE 2013)*, Madison, WI, August 17-21, 2013.Y. Li,
15. Cheng, M. H., & Bakhoum, E. (2013). Operation of Energy Harvesting Devices in Different Vibration Modes. In *2013 IEEE EnergyTech* (pp. 1-6). Cleveland, OH: IEEE. May 21-23, 2013.
16. Li, Y., & Cheng, M. H. (2012). Circuit Development of Piezoelectric Energy Harvesting Device for Recharging Solid-State Batteries. In *2012 ASME International Mechanical Engineering Congress & Exposition (IMECE2012)* (IMECE2012-88103). Houston, TX: ASME. November 9-15, 2012.
17. Cheng, M. H., & Bakhoum, E. (2011). Adaptive Robust Control of Tracking and Synchronization for Multi-Axis Motion System. In *2011 American Control Conference* (pp. 1-6). San Francisco, CA: IEEE. June 29 – July 1, 2011.
18. Cheng, M. H., Chen, C. Y., & Bakhoum, E. (2010). A Simplified Approach of Wordlength Estimation and Its Application. In *IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)*. Montreal, Quebec, Canada: IEEE. July, 2010.

19. Cheng, M. H.-M., Salekeen, S., Bakhoum, E., & Chen, C.-Y. (2010). Adaptive Control of Synchronization for Multi-Axis Motion System. In *IEEE SoutheastCon 2010 (SEC10)*. Charlotte-Concord, North Carolina, USA: IEEE. March 18-21, 2010.
20. Cheng, M. H.-M., Chen, C.-Y., & Mitra, A. (2009). Synchronization Controller Synthesis of Multi-Axis Motion System. In *the 4th International Conference on Innovative Computing, Information and Control (ICICIC 2009)*. Kaohsiung, Taiwan: IEEE. December 7-9, 2009.
21. Chen, C.-Y., Cheng, M. H.-M., & Yang, C.-F. (2009). Modified Sliding Mode Speed Control of Brushless DC Motor Using Quantized Current Regulator. In *the 4th International Conference on Innovative Computing, Information and Control (ICICIC 2009)*. Kaohsiung, Taiwan: IEEE. December 7-9, 2009. (doi: 10.1109/ICIEA.2009.5138651)
22. Cheng, M. H. M., & Bakhoum, E. G. (2009). Fractal compression and adaptive sampling with HV partitioning: accelerating the scanning process in scanning probe microscopy. In *ASME International Mechanical Engineering Congress and Exposition* (Vol. 43857, pp. 195-201). (doi: 10.1115/IMECE2009-10562)
23. Cheng, M. H.-M., Chiu, G. T.-C. & Franchek, M. A. (2009). Real-Time Measurement of Eccentric Motion with Capacitive Sensor for Hydraulic Pumps. In *2009 American Control Conference (ACC)*. St. Louis, MO, USA: IEEE. June 10-12, 2009. (doi: 10.1109/ACC.2009.5160063)
24. Cheng, M. H.-M., & Chen, C. Y. (2009). Discrete-Time Controller Synthesis of a Piezoelectric Cantilever Beam with the Consideration of Finite Precision. In *IEEE SoutheastCon 2009 (SEC09)*. Atlanta, Georgia, USA: IEEE. March 5-8, 2009.
25. Chen, C.-Y., Hsieh, F., Yu, S.-H., & Cheng, M. H.-M. (2009). Adaptive position control of integrated linear actuator and flexure mechanism. In *the 2009 4th IEEE Conference on Industrial Electronics and Applications (ICIEA).* Xi'an, China: IEEE. May 25-27, 2009. (doi: 10.1109/ICICIC.2009.343)
26. Chen, C. Y., Cheng, M. H. M., Yang, C. F., & Chen, J. S. (2008). Robust adaptive control for robot manipulators with friction. In *2008 3rd International Conference on Innovative Computing Information and Control* (pp. 422-422). Dalian, China: IEEE. June 18-20, 2008. (doi: 10.1109/ICICIC.2008.476)
27. Cheng, H.-M., & Chiu, G. T.-C. (2007). Coupling between sample rate and required wordlength for finite precision controller implementation with delta transform. In *2007 American Control Conference (ACC)*. New York City, New York: IEEE. July 11-13, 2007.
28. Cheng, H.-M., Desai, A., & Thomassian, J.-C. (2007). Wordlength Estimation of Digital Controller Synthesis for Inkjet Printer Mechanism. In *IEEE SoutheastCon 2007*. Richmond, Virginia: IEEE. March 22-25, 2007.
29. Chen, C. Y., Liao, P. S., & Cheng, H. M. (2007, May). Fuzzy controller design for positioning and synchronization of electrohydraulic system. In *2007 2nd IEEE Conference on Industrial Electronics and Applications* (pp. 971-976). IEEE.
30. Cheng, H.-M., & Chiu, G. T.-C. (2006). Adaptive Sampling for Atomic Force Microscopy with System Level Motion Constraints. In *Proceedings of SPIE Electronic Imaging*, 6065, 60650D. February 2006. (doi: 10.1117/12.660280)

31. Cheng, H.-M., & Chiu, G. T.-C. (2005). Fractal Compression and Adaptive Sampling for Atomic Force Microscopy. In *IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM). Monterey*, California, USA: IEEE. July 2005.
32. Cheng, H.-M., & Chiu, G. T.-C. (2004). Finite Precision Controller Implementation – Explore the Coupling between Sample Rate and Wordlength. In *Proc. of the 3rd International Federation of Automatic Control (IFAC) Symposium on Mechatronic Systems*. Sydney, Australia: IFAC. September 2004.
33. Cheng, H.-M., Chiu, G. T.-C., & Peng, H. (2004). RemoteLab – an Email Based On-Line Control Experiment Service. In *2004 American Control Conference (ACC)*. Boston, Massachusetts: IEEE. January 2004.
34. Cheng, H.-M., & Chiu, G. T.-C. (2003). Finite Precision Controller Implementation – Limitation on Sample Rate. In *IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)*. Kobe, Japan: IEEE. June 2003.
35. Cheng, H.-M., Chen, C. R., Tsai, Z. D., & Chen, J. R. (1999). Utility Optimization for the Beam Orbit Stability at SRRC. In *IEEE Proc. of the 1999 Particle Accelerator Conference* (pp. 1150-1152). New York, USA: IEEE. March 1999.
36. Cheng, H.-M., Chang, J., & Cheng, C.-C. (1998). Suppression of Background Noise in Speech. In *Proc. of 15th National Conference of the Chinese Society of Mechanical Engineers, Part A* (pp. 637-643). Tainan, Taiwan: IEEE. November 1998.
37. Cheng, H.-M., Chen, C.-Y., & Chiu, G. T.-C. (1998). An Application of Distributed Air-Conditioning Control Network. In *1998 American Control Conference (ACC)*. Philadelphia, Pennsylvania: IEEE. June 1998.
38. Chen, J. R., Cheng, H.-M., Tsai, Z. D., Chen, C. R., Lin, T. F., Hsiung, G. Y., & Hong, Y. S. (1998, June). The correlation between the beam orbit stability and the utilities at SRRC. In *Proc. of the 6th European Particle and Accelerator Conference (EPAC98)* (pp. 2309-2311), Stockholm, Sweden.
39. Cheng, H.-M., & Cheng, C.-C. (1997). Implementation of Distributed Control System for the Remotely Operated Vehicle. In *Proc. of the 1997 Automatic Control Conference* (pp. 773-778). Taipei, Taiwan: IEEE. March 1997.
40. Cheng, H. M., Kuo, C. C., Wang, S. D., & Chao, P. Y. (1994, April). AI based computer-controlled robot. In *Proc. of the 3rd Student Session of the Chinese Engineer Society*. Taipei, Taiwan.

Industrial Standards

1. Association for Advancing Automation. (2024). *American National Standard for Industrial Robots and Robot Systems – Safety Requirements, Part 3: Use of Industrial Robot Applications* (ANSI/A3 R15.06-3-2024). Under development.
2. Association for Advancing Automation. (2023). *American National Standard for Industrial Mobile Robots – Safety Requirements, Part 2: Requirements for IMR system(s) and IMR Application(s)* (ANSI/A3 R15.08-2-2023). Ann Arbor, MI, USA.
3. Association for Advancing Automation. (2020). *American National Standard for Industrial Mobile Robots – Safety Requirements, Part 1: Requirements for the Industrial Mobile Robot* (ANSI/A3 R15.08-1-2020). Ann Arbor, MI, USA.

Technical Reports and Other Publications

1. Cheng, M. & Knuth, R. (in review). *The Importance of Digital Twins and Digital Simulation in Enhancing Worker Safety in Robotic Manufacturing Applications*. NIOSH Science Blog.
2. Breloff, S., Earnest, S., Trout, D., Brogan, A., Cheng, M., & Carr, J. (2024, November 12). *Transforming construction: Automation and robotics for a safer future*. NIOSH Science Blog. https://blogs.cdc.gov/niosh-science-blog/2024/11/12/construction-robotics/
3. Cheng, M., Thomson, J., & Ye, C. (2024). *Framework for Intelligent Robotics and Autonomous Systems (IRAS) Interagency Working Group*. Intelligent Robotics and Autonomous Systems Interagency Working Group (IRAS IWG), Networking and Information Technology Research and Development (NITRD) Program.
4. Chiang, H. C., Yang, D., Lee, H. C., Cheng, H. M., Liu, T. C., & Chen, C. C. (1997, June). *Annual Report: Package Type of Ice Harvester Application Research*. ITRI, Research Project 06-03-86-0152.
5. Cheng, H. M., & Chiang, H. C. (1997). The New Trend of HVAC Control System. *CSHRAE Quarterly*, 5(4), 74-80 (Mandarin Chinese).
6. Cheng, H. M. (1997, February). The Past and the Trend of Internet. *Magazine of Refrigeration & Air-Conditioning Technology* (30), 53-60 (Mandarin Chinese).

Book Chapters

1. Chen, C.-Y., Shiau, J.-Y., Liu, C.-Y., Wu, K.-J., & Cheng, M. H. (2014). Chapter 26: Sliding Mode Voltage Control of the DC to DC Buck Converters. In J. Juang, C.-Y. Chen, & C.-F. Yang (Eds.), *Lecture Notes in Electrical Engineering* (Vol. 293). Springer, Switzerland.
2. Li, Y. J., Cheng, M. H., & Chen, C.-Y. (2014). Chapter 146: Operating Energy Harvesting Array at Higher Vibration Modes. In J. Juang, C.-Y. Chen, & C.-F. Yang (Eds.), *Lecture Notes in Electrical Engineering* (Vol. 293). Springer, Switzerland.

Invited Technical Presentation and Seminars

1. "Robotics Taking Over the Workplace – Part 1." *American Society of Safety Professionals*, On-Line Webinar, December 10, 2024.
2. "Human-Robot Collaboration in Construction." In *2024 NORA Construction Sector Council Meeting*, Washington DC, November 20-21, 2024.
3. "Safe Operations of Construction Robots on Human-Robot Collaborative Construction Sites," invited as a Keynote in *the 41st International Symposium on Automation and Robotics in Construction – ISARC 2024*, June 4, 2024, presented by Dr. C.-J. Liang.
4. "Human-Robot Collaboration in Future Manufacturing Workspaces: Enhancing the Safety and Efficiency." In the *OSHA/NIOSH/A3 Alliance Meeting*, On-Line, December 8, 2023.
5. "ASME/IMECE 2023: Human-Robot Collaboration & AI Integration Workshop / Panel: Risk and Safety for HRC," served as the panelist in *ASME/IMECE 2023*, New Orleans, LA, November 2, 2023.
6. "Human-Robot Collaboration in Future Manufacturing Workspaces: Enhancing the Safety and Efficiency." In the *ErgoX 2023*, Washington DC, October 23, 2023.

7. "Smart Technology for Reducing Occupational Injuries in the Construction Industry." In the *U.S. National Institute for Occupational Safety and Health and Taiwan Institute of Labor, Occupational Safety and Health Video Conference Meeting*, Virtual, On-Line, October 4, 2023.
8. "Enhancing Safety and Efficiency in Human-Robot Collaboration for Future Manufacturing Workspace," presented in *the Integrate Colloquium Series at the University of Wisconsin*, Madison WI, April 19, 2023.
9. "Understanding Safety and Trust of Human-Robot Interaction." In the *ErgoX 2022*, Atlanta GA, October 15, 2022.
10. Cheng, M., & Haney, J. "Real-Time Adjustment of Moving Trajectories for Collaborative Robotic Devices". In *the National Occupational Injury Research Symposium (NOIRS) 2022*, Virtual Conference, May 10-12, 2022.
11. "Understanding Safety and Trust of Human-Robot Interaction." In *the Vision Zero Summit Japan*, Virtual, On-Line, May 11, 2022.
12. "Robotics Research and Applications for Occupational Safety and Health." In *the 6th Annual Virtual CDC Laboratory Science Symposium*, Virtual, On-Line, January 27, 2022.
13. "Research on Worker Safety and Robots," served as the panelist *in the 2021 NSF National Robotics Initiative Principal Investigators' Meeting*, Virtual On-Line, March 11, 2021.
14. "Robotics Research and Applications for Rehabilitation and Occupational Safety," presented at the *University of Maryland Baltimore County*, virtual, April 2020.
15. "Robotics Research and Applications for Rehabilitation and Occupational Safety," presented at *George Mason University*, virtual, April 2020.
16. "Robotics Research and Applications for Occupational Safety and Health." In *the NYNJ ERC 40th Annual Scientific ERC Meeting*, New York, NY, September 20, 2019.
17. "Contact Avoidance between Human Workers and Collaborative Robots," presented at *Robotics Interest Forum*, *National Institute for Occupational Safety and Health*, Morgantown, WV, May 9, 2019.
18. "Emerging Robotics and Exoskeleton Technology: Implications for Worker Safety and Health." In the *American Occupational Health Conference 2019*, Anaheim, CA, May 1, 2019.
19. "Developments and Applications of Wearable Robotic Systems," presented at *Widener University*, Chester PA, May 2018.
20. "Developments and Applications of Wearable Robotic Systems," presented at *National Sun Yat-Sen University*, Kaohsiung, Taiwan, April 2018.
21. "Integration of Cyber-Physical Systems with Wearable Robotic Systems," presented at the *Korea Advanced Institute of Science and Technology (KAIST)*, Daejeon, Korea, December 2017.
22. "Cyber-Physical Systems with the Integration of Wearable Robotic Systems," presented at *National Tsing-Hua University*, Hsinchu, Taiwan, November 2017.
23. "Developments and Applications of Wearable Robotic Systems," presented at the *University of Maine*, Orono ME, April 2017.

24. "Recent Research and Development of Robotic Systems," presented at *National Tsing Hua University*, Hsinchu, Taiwan, October 2016.
25. "Research of Mechatronic and Robotic Systems at WVU," presented at la *Universidad Aeronéutica en Querétaro*, Mexico, January 2016.
26. "Development of Mechatronic Systems," presented at *Cheng-Siu Technical University*, Kaohsiung, Taiwan, May 2011.
27. "Design, Fabrication and Applications of MEMS / Nano Devices," presented at *West Virginia University*, Morgantown WV, March 24, 2010.
28. "Fractal Compression and Adaptive Sampling for Atomic Force Microscopy," presented at *Texas A&M University*, College Station TX, February 2009.
29. "Fractal Compression and Adaptive Sampling for Atomic Force Microscopy," presented at the *University of Alabama*, Tuscaloosa AL, April 2008.
30. "Synthesis of Digital Controller with the Limited Resolution," presented at *Villanova University*, Villanova PA, February 2008.
31. "Implementation of Digital Controller with the Consideration of Finite Wordlength," presented at the *University of Arkansas*, Fayetteville AK, March 2008.
32. "Adaptive Sampling Algorithm of Atomic Force Microscopy," presented at the *National Chung-Cheng University*, Chia-Yi, Taiwan, November 2005.
33. "Fractal Compression and Adaptive Sampling for Atomic Force Microscopy," presented at *North Dakota State University*, Fargo ND, April 25, 2005.
34. "An E-Mail Based On-Line Control Experiment Service for Distance Learning". In *Teaching and Learning with Technology Conference* 2005. West Lafayette, Indiana. February 15-16, 2005.
35. Cheng, H.-M., & Chiu, G. T.-C. (2004). "Improved AFM Imaging Speed with Adaptive Sampling and Path Planning". In *the Workshop on Scanning Probe Microscopy*. West Lafayette, Indiana. February 2004

Honors and Awards

1. Alice Hamilton Award for Occupational Safety and Health, nominated, January 2025.
2. The Second Best Paper in the 41st International Symposium on Automation and Robotics in Construction (ISARC 2024), June 2024.
3. Alice Hamilton Award for Occupational Safety and Health, nominated, January 2024.
4. Workshop of Cyber-physical Systems, National Science Foundation, 2017, $800.
5. Outstanding Teacher Award of West Virginia University Statler College of Engineering and Mineral Resources, West Virginia University, April 2016.
6. IEEE Consumer Electronics Society Chester Sall Award for the second-place best paper in the IEEE Consumer Electronics Transactions, May 2015.
7. The George W. Weaver Award, Excellent Teaching, Department of Mechanical and Aerospace Engineering, West Virginia University, April 2015.

8. Research Excellence Nomination, Georgia Southern University, March 2010.
9. AIM (International Conference on Advanced Intelligent Mechatronics) Academic Travel Grant, August 2005.
10. Best Student Paper of the Proceedings of 2005 Advanced Intelligence Mechatronics, August 2005.
11. The Magoon Teaching Assistant Award, Outstanding Graduate Student for Excellence in Teaching, Purdue University, May 2005.
12. American Control Conference Travel Grant, July 2004.
13. TECO (Taipei Economic and Culture Office) Academic Travel Grant, May 2004.
14. Purdue University Graduate Student Travel Grant, May 2004.
15. Taiwan Electric Power Company University and Research Fellowship, June 1995.
16. National Sun Yat-Sen University Student of Distinction, June 1994.
17. National Sun Yat-Sen University Excellent Student Award in Mechanical Engineering, (6 times), 1991~1994.
18. National Sun Yat-Sen University Excellent Student Award, (4 times), 1991~1994.

Teaching Experience

Teaching Awards:

- Outstanding Teacher Award of West Virginia University Statler College of Engineering and Mineral Resources (2016)
- The George W. Weaver Award, Excellent Teaching, Department of Mechanical and Aerospace Engineering (2015)
- The Magoon Teaching Assistant Award, Outstanding Graduate Student for Excellence in Teaching, May 2005.

Teaching Experience at the National Tsing Hua University (Taiwan):

- Average Student Evaluation Score at NTHU (4.9/5)
- Graduate Course: Nonlinear Control
- Undergraduate Course: Automatic Control System

Teaching Experience at West Virginia University:

- Average Student Evaluation Score at WVU (4.43/5)
- Graduate Courses: MAE 653 Advanced Vibrations, MAE 593G Embedded Systems
- Undergraduate Courses: MAE 211 Mechatronics, MAE 241 Statics, MAE 411 Advanced Mechatronics, MAE 460 Automatic Control, MAE 493Z Microprocessor

Teaching Experience at Georgia Southern University:

- Undergraduate Courses: TMET 4890 Mechanical Control, TENS 2141 Statics, TENS 2142 Dynamics, TMET 3711 Introduction to Engineering Mathematics, TMET 2521 Mechatronics
- Graduate Courses: TMET 7136 Advanced Mechatronics, TMET 7137 Embedded Systems

Professional Service

- Reviewer of *Alice Hamilton Research Award* in NIOSH (since 2019).
- Member of *Manufacturing Steering Committee* in NIOSH (since 2019).
- Member of *Robotic Steering Committee* in NIOSH (since 2018).
- Panel Reviewer of National Science Foundation (since 2010).
- Academic Editor of *Journal of Sensors* (since 2018).
- Editor of *International Journal of Intelligent Technologies and Engineering Systems* (2011).
- Editor of *International Journal of Convergence Information Technology* (2009 ~ 2011).
- Publicity Chair of *2010 IEEE/ASME Advanced Intelligent Mechatronics* (AIM 2010).
- Associate Editor of *IEEE/ASME Advanced Intelligent Mechatronics (2010).*
- Associate Editor of *American Control Conference (since 2008).*
- Member of Technical Committee of *the International Symposium on Industrial Electronics, Mechatronics and Applications (2007)*.
- Member of Program Committee of *American Control Conference (2016)*.
- Reviewer of *IFAC Journal of Control Engineering Practice* (since 2005).
- Reviewer of *IEEE Transactions on Instrumentation & Measurement* (since 2006).
- Reviewer of *ASME Journal of Dynamic Systems, Measurement and Control* (since 2003).
- Reviewer of *Journal of System and Control Engineering* (since 2005).
- Reviewer of *Journal of Scanning* (since 2005).
- Reviewer of *American Control Conference* (*ACC 2004 - 2018*).
- Project reviewer of *National Science Council in Taiwan*.

Other Services and Outreach Activities

- Vice President of the Taiwanese Culture Association of West Virginia (since 2024).
- Volunteer of West Virginia Robotics Extreme (WVROX) Robotics Competition, hosted by Mountaineer Area RoboticS (2024).
- Judge of the Real World Design Challenge (RWDC) for high school students, hosted by Embry-Riddle Aeronautical University (2021 to 2023).
- Judge of West Virginia State Science Bowl for middle schools and high schools, hosted by the National Energy Technology Laboratory (2019 to 2021).
- Lab presentation for freshmen and high school senior students (GSU, WVU, and NTHU; 2006 to 2018).
- Curriculum development of Scratch Jr. for the 1st Grade students at Suncrest Elementary School (2016).
- Advisor of undergrad student: (2007 to 2018, more than 600 students)

- Members of ABET Evaluation Committee (2011 to 2017).
- Chair and member of Ph. D Qualification Examination Committees (2011 to 2016).
- Advisor for Taiwanese Student Association at West Virginia University (2012).
- University advisor of the robotic team at Langston Chapel Middle School for the LEGO robotic competition of the FIRST League (2007).
- President of Taiwanese Graduate Student Association (I Love Taiwan Club) at Purdue University (2002).

Advised Graduate Students, Fellows, and Postdoc Scholars

- Vaishakhi Suresh (2024 Postdoc Fellow), current, *NIOSH*.
- Sukruthi Chidananda (2024 Regular Fellow), *Vecna Robotics*.
- Ci-Jyun Liang (2021 Postdoc Fellow), Assistant Professor, *Stony Brook University.*
- Hemal Dave (2020 Regular Fellow), Biomedical Engineer, *NIOSH*.
- Po-Lin Huang (2019 Master), Senior Electrical Engineer, *ZT Systems*.
- Tim Chu (2019 Master).
- Mahmood Rahman (2018 Postdoc Fellow), Assistant Professor, *University of Texas, Arlington*.
- Lei Jiang (2016 PhD), Associate Professor, *China University of Mining & Technology*.
- Qian Mou (2016 Master).
- Yuejuan Li (2014 PhD), Associate Professor, *Beijing University of Technology*.
- Reza Shisheie (2014 Master), Robotics Engineer, *CO-AX Technology Inc.*
- Jeremy Thompson (2014 Master), *Milestone Real Estate Group*.
- Karen Flores de Jesus (2013 Master), Application Engineer, *Shaeffler Group USA*.
- Corrie Herington (2010 Master).

Undergrad Research Projects

- Path Planning for Swarming Microdrones Using Fractal Analysis on Construction Sites (2024), with North Carolina State University
- Identifying Fall Hazards on Construction Sites Using Microdrone Swarming (2023), with North Carolina State University.
- Acquisition and Synthesis of Virtual Workspace for Robotic Devices (2022), with North Carolina State University.
- Motion Prediction of Human Workers in Collaborative Workspaces (2020), with North Carolina State University
- Design of Autonomous Navigation Robot (2017 ~ 2018), with the National Tsing-Hua University.
- NASA Sample Return Challenge (2013 ~ 2016), with West Virginia University
- Identification of Human Arm Trajectories (2014 ~ 2016), with West Virginia University
- Rocket Navigation Control (2013 ~ 2014), with West Virginia University

- Controller Design of 3D Printer (2010), with Georgia Southern University

Professional Society Affiliations

- Voting member of Association for Advancing Automation (A3) R15 Standard Committee.
- Member of IEEE.
- Member of ASME.
- Member of ISA.

President
Sharon Peng
Harman International
Northridge, California, USA

Brian Markwalter
VP, Operations and Planning
Consumer Electronics Association
Arlington, Virginia, USA

Stefan Mozar
Past President
Sydney, Australia

Simon Sherratt
The University of Reading
RG6 6AY, UK

Wayne Luplow
Zenith R&D Lab
Lincolnshire, Illinois, USA

William Lumpkins
O & S Services & Wi2Wi Inc.
Murphy, Texas, USA

Fernando Pescador
Universidad Politécnica de Madrid
28031 Madrid, Spain

Larry Zhang
4205 Mildenhall Drive
Plano, Texas, USA

Narisa Chu
CWLab International, Ltd.
Thousand Oaks, CA, USA

Peter Corcoran
National University of Ireland
Galway, Ireland

Tom Coughlin
Coughlin Associates
San Jose CA, USA

Joonki Paik
Chung-Ang University
Seoul 156-756, Korea

Konstantin Glasman
St. Petersburg State
St.Petersburg, Russian Federation

Joe Decuir
18814 SE 42nd St,
Issaquah, WA, USA

Stephen D. Dukes
VP, Conferences
Camano Island, WA USA

Bob Frankston
278 Lake Ave
Newton MA, USA

Scott Linfoot
MASS
Cambridgeshire, UK

Takako Nonaka
Shonan Institute of Technology
Fujisawa, Kanagawa, Japan

Charlotte Kobert
Executive Administrator

IEEE

IEEE Consumer Electronics Society

March 12, 2015

Ezzat G. Bakhoum
University of West Florida
Pensacola, FL, USA
ebakhoum@uwf.edu

Marvin H. M. Cheng
West Virginia University

Dear Ezzat and Marvin,

Congratulations on being named a 2015 winner of the IEEE Consumer Electronics Society Chester Sall Award for the Second place best paper in the IEEE Consumer Electronics Transactions 2013.

Second Place Transactions Award
Authors: *Ezzat G. Bakhoum, Marvin H.M. Cheng*

Paper Title: "*Novel Electric Micromoter for Consumer Electronics Applications*"

I wish to inform you of the details of the event relating to this award. The presentation of the award will be made at the Banquet for the ICCE-Taiwan Conference, which takes place June 6-8, 2015, National Taiwan University of Science and Technology, Taipei, Taiwan, http://www.icce-tw.org/iccetw2015/

Event: ICCE-Taiwan 2015 Banquet
Date: Sunday, June 7th, 2015
Time: 18:00 to 20:00

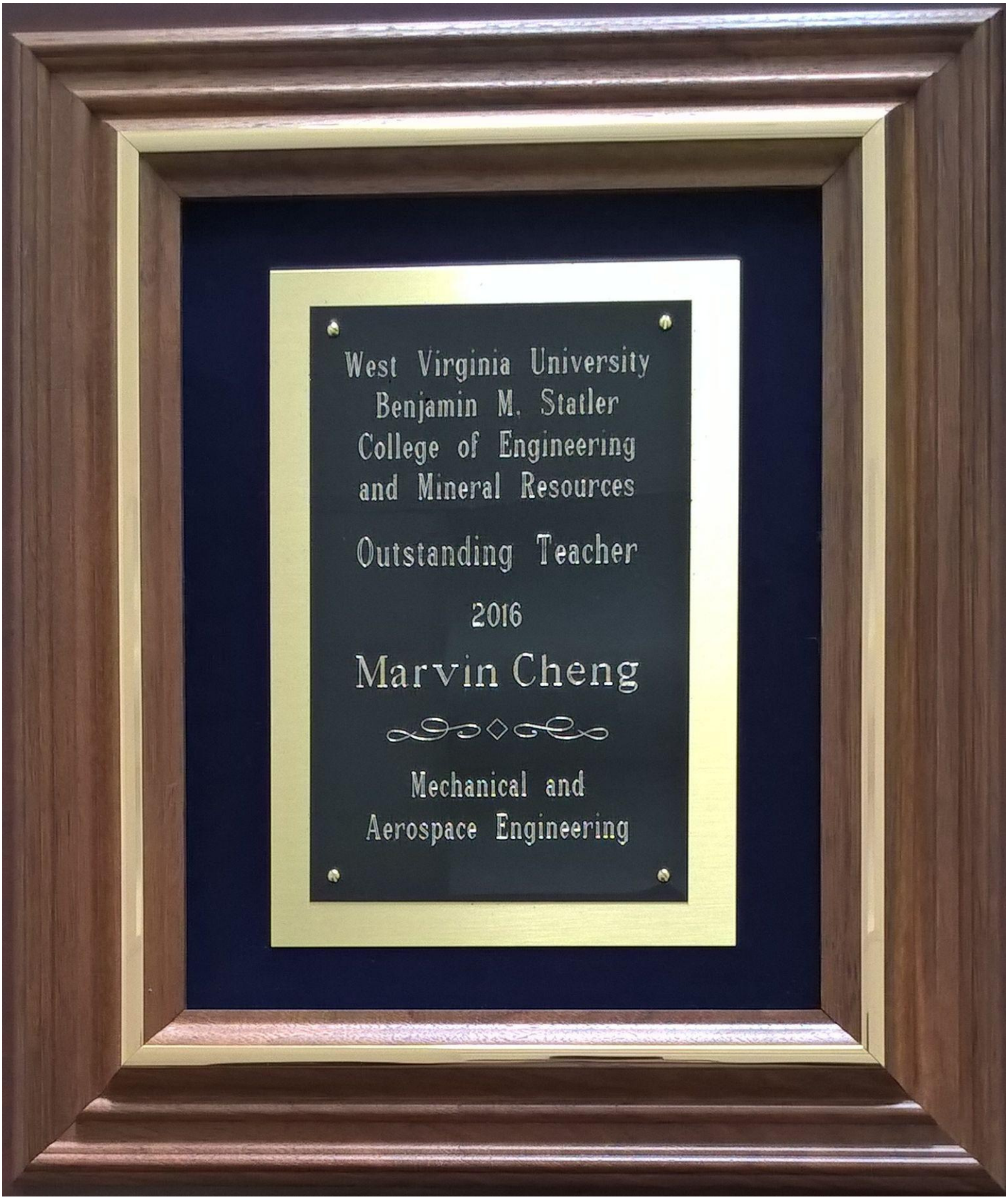
The Banquet will begin at 6:00 pm with award presentations taking place between 6:15 and 7:45 pm.

Also, in order to process honoraria associated with Society awards, IEEE requires each awards recipient, for tax purposes, to provide a completed W-9 form for an award recipient living within the United States OR a completed W-8 form for an award recipient living outside the United States. Therefore, please complete the appropriate tax form (both are attached) and fax to (1 732 981 1769) to the attention of Liz Parascondola. Or you can scan them and send to the conference Coordinator, Charlotte Kobert by email at ckobert@ieee.org . This needs to be as quickly as possible, as the conference is fast approaching. Please also let the coordinator know if you will be attending the Conference. If you will not be attending, please have someone accept your award for you and let us know who this person will be as soon as possible.

Please acknowledge by email that you have received this letter.

Sincerely,

Larry Zhang
IEEE Consumer Electronics Society
Awards Chairman


West Virginia University
Benjamin M. Statler
College of Engineering
and Mineral Resources
Outstanding Teacher
2016
Marvin Cheng
Mechanical and
Aerospace Engineering

The Department of
MECHANICAL AND AEROSPACE ENGINEERING
Benjamin M. Statler College of Engineering and Mineral Resources
WEST VIRGINIA UNIVERSITY

BE IT KNOWN THAT IN RECOGNITION OF
OUTSTANDING TEACHING OF UNDERGRADUATE
COURSES IN MECHANICS

Dr. Hung-Ming (Marvin) Cheng

IS HEREBY DESIGNATED AS THE RECIPIENT OF THE

2014-2015
GEORGE W. WEAVER AWARD

Jacky C. Prucz, Chairman
Mechanical and Aerospace
Engineering Department

Eugene V. Cilento

Eugene V. Cilento, Glen H. Hiner Dean
Benjamin M. Statler College of
Engineering and Mineral Resources