

Xiaobo Tan

Richard M. Hong Endowed Chair and MSU Research Foundation Professor

Director, Smart Microsystems Laboratory

Department of Electrical & Computer Engineering

Department of Mechanical Engineering (by courtesy)

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PROFESSIONAL PREPARATION

Tsinghua University, Beijing, China	Automatic Control	B.E., 1995
Tsinghua University, Beijing, China	Automatic Control	M.E., 1998
University of Maryland at College Park	Electrical Engineering	Ph.D., 2002
University of Maryland at College Park	Controls	Postdoc, 2002-2004

APPOINTMENTS

Richard M. Hong Endowed Chair (July 2020 - present), *MSU Foundation Professor* (January 2016 - present), *Professor* (2015 - present), *Associate Professor* (2010 - 2015), *Assistant Professor* (2004 - 2010), Department of Electrical & Computer Engineering, Michigan State University, East Lansing, MI

Professor (2015 - present), *Associate Professor* (2011 - 2015), Department of Mechanical Engineering (by courtesy), Michigan State University, East Lansing, MI

Postdoctoral Research Associate (2002 - 2004), Institute for Systems Research, University of Maryland, College Park, MD

Graduate Research Assistant (1998 - 2002), Department of Electrical & Computer Engineering, University of Maryland, College Park, MD

HONORS AND AWARDS

1. Elected **Editor-in-Chief**, IEEE/ASME Transactions on Mechatronics, term starting January 2026.
2. **William J. Beal Outstanding Faculty Award**, Michigan State University, 2023. Awarded to up to 10 faculty members university-wide per year, for “*outstanding total service to the University*”.
3. **Plenary speaker**, 2023 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, 2023.
4. **Semi-plenary speaker**, 2022 American Control Conference, 2022.
5. **Plenary speaker**, 2022 IEEE 17th International Conference on Advanced Motion Control, 2022.
6. **Plenary speaker**, 2020 ASME Dynamic Systems and Control Conference, 2020.
7. Named **Richard M. Hong Endowed Chair in Electrical Engineering**, 2020.
8. **Fellow**, the American Society of Mechanical Engineers (ASME), 2019, for “*significant contributions to the development, modeling, and control of electromechanical systems in the areas of smart materials, soft robotics, and underwater robotics.*”
9. **Distinguished Alumni Award**, Department of Electrical and Computer Engineering, University of Maryland, College Park, 2018.

10. **Withrow Distinguished Scholar (Senior) Award**, MSU College of Engineering, 2018. Awarded to one senior faculty member per year.
11. **Fellow**, the Institute of Electrical and Electronics Engineers (IEEE), 2017, “*for contributions to modeling and control of smart materials and underwater robots.*”
12. Named **MSU Foundation Professor**, 2016. Title awarded to “*individuals who combine externally recognized, exemplary scholarly accomplishment and/or potential, with clear professional relevance to specific areas of MSU scholarly need, disciplinary development, or research or creative emphasis.*”
13. **Teacher-Scholar Award**, Michigan State University, 2010. Awarded to up to 6 faculty members university-wide per year “*who early in their careers have earned the respect of students and colleagues for their devotion to and skill in teaching.*”
14. **Faculty Early Career Development Award (CAREER)**, the National Science Foundation, 2006.
15. **Best Paper Awards** (Superscript [#] indicates Dr. Tan’s advisee)
 - *Best Conference Paper Award in Modeling* (with Maria Castano[#]), 2021 AACC Modeling, Estimation and Control Conference (MECC 2021), for paper “Averaged modeling of pectoral-fin actuated robotic fish.”
 - *2020 Best Paper Award on Mechatronics* (with Yasir Al-Nadawi[#] and Hassan K. Khalil), ASME Dynamic Systems and Control Division Technical Committee on Mechatronics, 2020, for paper “Inversion-free control of hysteresis nonlinearity using an adaptive conditional servomechanism” (presented at 2019 American Control Conference).
 - *Best Paper Award* (with Hong Lei[#]), Symposium on Modeling, Simulation and Control of Adaptive Systems, ASME 2014 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS 2014), for paper “A novel tubular thin-wall IPMC sensor capable of two-dimensional sensing: Fabrication, characterization and modeling.”
 - *Best Conference Paper in Applications Award* (with Jun Zhang[#], Emmanuelle Merced, and Nelson Sepulveda), 2013 ASME Dynamic Systems and Control Conference (DSCC 2013), for paper “Optimal compression of a generalized Prandtl-Ishlinskii operator in hysteresis modeling.”
 - *Best Paper Award in Behavior and Intelligence* (with Anthony Clark, Jared Moore, Jianxun Wang[#], and Philip K. McKinley), 13th International Conference on the Simulation and Synthesis of Living Systems (Alife XIII), 2012, for paper “Evolutionary design and experimental validation of a flexible caudal fin for robotic fish.”
 - *2008 DSCD Best Mechatronics Paper Award* (with Yang Fang[#]), ASME Dynamic Systems and Control Division (DSCD), 2009, for paper “Design and modeling of a petal-shape, conjugated polymer-actuated micropump” (presented at 2008 ASME Dynamic Systems and Control Conference).
16. **Finalist, Best Paper Awards** (Superscript [#] indicates Dr. Tan’s advisee)
 - Finalist, 2020 International Journal of Intelligent Robotics and Applications Best Paper Award (with T. Pinto[#], L. Cai, and C. Wang), for paper “CNT-based sensor arrays for local strain measurements in soft pneumatic actuators” (vol. 1, 2017).
 - Finalist, Best Paper Award (with X. Qi[#], H. Shi[#], and T. Pinto[#]), 2020 IEEE International Conference on Soft Robotics (RoboSoft 2020), for paper “A novel pneumatic soft snake robot using traveling-wave locomotion in constrained environments.”
 - Runner-up, Best Conference Paper Award (Information Processing Track, with Y. Wang, R. Tan, G. Xing, J. Wang[#], X. Liu, and X. Chang), 2014, 13th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN 2014), for paper “Aquatic debris monitoring using smartphone-based robotic sensors.”

- Finalist, Best Conference Paper Award (with E. Merced, J. Zhang[#], and N. Sepulveda), 2013 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2013), for paper “Robust control of VO₂-coated microactuators based on self-sensing feedback.”
- Finalist, Best Student Paper Award, the 41st IEEE Conference on Decision and Control, 2002, for paper “Modeling and control of a magnetostrictive actuator.”

17. **Best Student Paper Awards/Finalists (as advisor)** (Superscript [#] indicates Dr. Tan’s advisee)

- Yu Mei[#], Best Student Paper Award, 2024 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2024), for paper “Simultaneous shape reconstruction and force estimation of soft bending actuators using distributed inductive curvature sensors.”
- Mohammed Al-Rubaiai[#], Best Student Paper Gold Award, 2021 AACC Modeling, Estimation and Control Conference (MECC 2021), for paper “Control-oriented nonlinear modeling of polyvinyl chloride (PVC) gel actuators.”
- Sanaz Behbahani[#], Finalist for Best Student Paper Award, ASME 2014 Dynamic Systems and Control Conference (DSCC 2014), for paper “Design and dynamic modeling of a flexible feathering joint for robotic fish pectoral fins.”
- Hong Lei[#], Finalist for Best Student Paper Award, ASME 2014 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS 2014), for paper “A novel tubular thin-wall IPMC sensor capable of two-dimensional sensing: Fabrication, characterization, and modeling.”
- Jun Zhang[#], Student Best Paper Competition Award, ASME 2012 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS 2012), for paper “Modeling of non-monotonic hysteresis behavior in VO₂-based MEMS actuators.”

RESEARCH AND EDUCATIONAL GRANTS

Extramural Funding

1. PI, “Autonomous surface vehicle (ASV) for real-time mobile acoustic telemetry,” Great Lakes Fishery Commission, \$85,808, 1/1/2025-12/31/2026 (Co-PIs: C. Holbrook, D. Hondorp, T. Funnell)
2. PI, “Smart Panel for Abundance Assessment of Pacific Lamprey,” Pacific Lamprey Conservation Initiative/Bonneville Power Administration, \$67,917, 5/1/2025-7/31/2026 (Co-PIs: N. Sepulveda, S. Miehl, B. J. Clemens, K. Frick, T. Liedtke, R. Lampman, K. S. Tidwell, M. Blanchard)
3. PI, “Access of Smart Microsystems Lab by Motmot,” Motmot, Inc., \$4,536, 10/1/2024-9/30/2026
4. PI, “I-Corps: Autonomous Aquabots for Water Main Inspections,” National Science Foundation, \$50,000, 1/15/2024-12/31/2025
5. PI, “NRT-HDR: WaterCube: Big Data Water Science for Sustainability and Equity,” National Science Foundation, \$3,000,000, 8/1/2023-7/31/2028 (Co-PIs: M. S. Phanikumar, P. Tan, J. B. Rose, S. P. Gasteyer, Y. Pokhrel, C. M. Wagner, J. Carrera)
6. PI (at MSU), “Collaborative Research: Unsupervised Active Learning for Aquatic Robot Perception and Control,” National Science Foundation, \$396,873, 4/15/2023 - 3/31/2026 (Collaborator: T. Murphey from Northwestern University)
7. PI, “Sensitized Grippers for Safe Harvesting and Handling of Fruits and Vegetables,” MTRAC AgBio, \$50,000, 8/16/2023 - 5/15/2024
8. PI, “PVC Gel Sensors,” Toyota Motor Engineering & Manufacturing, North America, Inc., \$30,000, 12/1/2022 - 12/31/2023

9. PI (at MSU), “Collaborative Research: FW-HTF-P: Efficient Inspection of Unpiggable Pipelines through Human-Robot Integration,” National Science Foundation, \$60,000, 10/1/2022 - 9/30/2023 (Co-PI: H. Lee; Collaborators: Y. Liu and W. Zhang from Arizona State University)
10. PI, “Automated Water Sampler,” Great Lakes Fishery Commission, \$66,038, 5/1/2022 - 8/31/2023
11. PI, “High-throughput Infrastructure-enabled Automated Valet Parking System,” Ford Motor Company, \$99,943, 6/17/2022 - 6/16/2023 (Co-PI: V. Srivastava)
12. PI, “PVC Gels with Conductive Additives,” Toyota Motor Engineering & Manufacturing, North America, Inc., \$60,000, 2/1/2022 - 9/30/2022
13. PI, “Open-Source Unmanned Surface Vehicle (USV) for Mobile Acoustic Telemetry,” Great Lakes Fishery Commission, \$70,098, 1/1/2022 - 3/31/2024 (Co-PIs: C. Holbrook, D. Hondorp)
14. PI, “Smart Panel for Detection and Deterrence of Sea Lampreys,” Great Lakes Fishery Commission, \$79,939, 1/1/2022 - 12/31/2024 (Co-PIs: N. Sepulveda, C. Holbrook, S. Miehl)
15. Co-PI, “SCC-IRG Track 1: Connecting Farming Communities for Sustainable Crop Production and Environment Using Smart Agricultural Drainage Systems,” National Science Foundation, \$1,750,000, 10/1/2021 - 9/30/2025 (PI: L. Dong (ISU); Other Co-PIs: H. Feng (ISU), M. Castellano (ISU), M. Lechtenberg (Iowa Department of Agriculture and Land Stewardship))
16. PI, “Active Flexible Surface for Boundary Flow Studies,” Naval Research Laboratory, \$36,411, 6/8/2021 - 12/7/2021
17. PI, “PVC Gel Actuators: Characterization, Optimization, and Exploration,” Toyota Motor Engineering & Manufacturing, North America, Inc., \$75,994, 4/15/2021 - 2/28/2022
18. Co-PI, “NRI: INT: SMART: Soft Multi-arm Robot for Synergistic Collaboration with Humans,” National Science Foundation, \$1,499,255, 9/1/2020 - 8/31/2025 (PI: Z. Li; Other Co-PIs: C. Cao, V. Srivastava; Collaborator: R. Lu)
19. PI, “PVC Gel Actuators,” Toyota Motor Engineering & Manufacturing, North America, Inc., \$47,652, 8/16/2020 - 2/28/2021
20. Co-PI, “AI-enabled ILI Robot with Integrated Structured Light NDE for Distribution Pipelines,” U.S. Department of Transportation (PHMSA), \$250,000, 9/1/2020 - 8/31/2023 (PI: Y. Deng; Collaborator: H. Zhang from Colorado School of Mines)
21. Co-PI, “Scalable Randomized Scheduling of Mobile Sensors with Observability Guarantees,” National Science Foundation, \$360,000, 9/1/2020 - 8/31/2023 (PI: S. Bopardikar)
22. PI, “Lightweight Pumps for Inflatable Structures,” Toyota Motor Engineering & Manufacturing, North America, Inc., \$35,000, 3/1/2020 - 6/15/2020
23. Co-PI, “Reshape Motor Learning in High-Dimensional Tasks via Soft Robotic Physical Interactions,” National Science Foundation, \$700,000, 4/1/2020 - 3/31/2025 (PI: V. Srivastava; Other Co-PI: R. Ranganathan)
24. Co-PI, “Circuit Dynamics of Sensorimotor Integration and Decision Making in Octopus,” National Institutes of Health, \$2,323,583, 4/15/2020 - 3/31/2025 (PI: G. Pelled; Other Co-PIs: A. Alessio, T. Bush, A. Vazquez; Collaborators: C. Chestek from University of Michigan, and C. Ragsdale from University of Chicago)
25. Co-PI, “Road Map for Using Inline Inspection Robot with Integrated Structured Light Sensor in Utility Lines,” Gas Technology Institute, \$11,921, 8/1/2019 - 3/31/2020 (PI: Y. Deng)
26. PI, “Distributed Monitoring of Inflatable Structures,” Toyota Motor Engineering & Manufacturing, North America, Inc., \$45,846, 8/1/2019 - 2/29/2020

27. PI (at MSU), “S&AS: INT: COLLAB: Goal-driven Marine Autonomy with Application to Fisheries Science and Management,” National Science Foundation, \$225,000, 2/15/2019 - 1/31/2022 (Collaborators: F. Zhang from Georgia Tech, C. Edwards from University of Georgia, and M. Cox from Wright State University)
28. Senior personnel, “RET Site: Multidisciplinary Computational Solutions to Smart Sensors and Sensing Systems,” National Science Foundation, \$599,997, 2/15/2019 - 1/31/2025 (PI: W. Li; Co-PI: A. Kim; 11 other senior personnel)
29. PI, “Development of a Controllable Surface for Boundary Flow Studies,” Naval Research Laboratory, \$72,231, 3/11/2019 - 2/6/2020
30. PI, “Detection and Localization of Kinks in Inflatable Tubes,” Toyota Motor Engineering & Manufacturing, North America, Inc., \$92,414, 8/1/2018 - 7/31/2019
31. Co-PI, “7th Midwest Workshop on Control and Game Theory,” National Science Foundation, \$20,000, 6/1/2018 - 2/28/2019 (PI: V. Srivastava)
32. PI, “Exploiting the Unexploited: A Smart Panel System for In-situ Detection of Adult Sea Lamprey,” Great Lakes Fishery Commission, \$50,000, 1/1/2018 - 12/31/2020 (Co-PI: C. Wang)
33. PI, “Smart Wind-sensing Wire Technology,” Toyota Motor Engineering & Manufacturing, North America, Inc., \$11,223, 1/1/2018 - 6/30/2018 (Co-PI: C. Wang)
34. PI (at MSU), “RI: Small: Collaborative Research: Information-driven Autonomous Exploration in Uncertain Underwater Environments,” National Science Foundation, \$265,000, 9/1/2017 - 8/31/2021 (Collaborator: T. Murphey from Northwestern University)
35. Co-PI, “NRI: FND: A Framework for Human-Team-Supervised Autonomy with Application to Underwater Search and Rescue,” National Science Foundation, \$749,997, 8/15/2017 - 7/31/2021 (PI: V. Srivastava)
36. Senior personnel (33% credit), “RET Site: Smart Sensors and Sensing Systems,” National Science Foundation, \$600,000, 2/15/2016 - 1/31/2019 (PI: W. Li; Co-PI: A. Kim)
37. PI (at MSU), “Bio-inspired Underwater Sensing and Control with Mechanosensitive Hairs,” Office of Naval Research/University of Maryland, \$337,000, 5/1/2015 - 4/30/2018 (Collaborators: D. Paley (project lead) from University of Maryland, and M. McHenry from University of California, Irvine)
38. PI, “CPS: Synergy: Tracking Fish Movement with a School of Gliding Robotic Fish,” National Science Foundation, \$1,000,000, 11/1/2014 - 10/31/2019 (Co-PIs: C. Krueger and G. Xing)
39. PI (at MSU), “Development of a Cost-effective Multi-modal Underwater Robot for Fisheries Research & Environmental Monitoring,” U.S. Geological Survey/Great Lakes Fishery Commission, \$52,500, 10/1/2014 - 9/30/2015 (Collaborators: D. Hondorp (project lead), C. Holbrook, and C. Krueger)
40. PI, “A Gliding Robotic Fish-based Mobile Receiver Platform for Acoustic Telemetry in Fishery Research,” Great Lakes Fishery Commission, \$63,000, 5/16/2014 - 5/31/2017 (Collaborators: C. Holbrook, D. Hondorp, and C. Krueger)
41. PI, “CyberSEES: Type 2: Towards Sustainable Aquatic Ecosystems: A New Adaptive Sampling and Data-Enabled Monitoring and Modeling Framework,” National Science Foundation, \$800,000, 10/1/2013 - 9/30/2016 (Co-PIs: E. Litchman, M. Phanikumar, H. Radha, and G. Xing)
42. PI, “AIR Option 1: Technology Translation: Gliding Robotic Fish for Long-duration Sensing in Aquatic Environments,” National Science Foundation, \$154,359, 9/15/2013 - 2/29/2016
43. PI, “RI: Small: Collaborative Research: Bio-inspired Collaborative Sensing with Novel Gliding Robotic Fish,” National Science Foundation, \$257,315, 8/1/2013 - 7/31/2017 (Collaborator: F. Zhang from Georgia Tech)

44. PI, "Novel Vanadium Dioxide-based Self-Sensing Microactuators: Modeling, Control, and Application to Micromanipulation," National Science Foundation, \$300,000, 6/1/2013 - 5/31/2017 (Co-PI: N. Sepulveda)
45. PI, "RET in Engineering and Computer Science Site: Robotics Engineering for Better Life and Sustainable Future," National Science Foundation, \$500,000, 4/1/2013 - 3/31/2016 (Co-PI: A. Kim)
46. PI (at MSU), "Bio-inspired Flow Sensing and Control for Autonomous Underwater Vehicles," Office of Naval Research/University of Maryland, \$180,000, 1/1/2012 - 12/31/2014 (Collaborators: D. Paley (project lead) and J. S. Humbert from University of Maryland, and S. Coombs from Bowling Green State University)
47. Co-PI, "II-EN: Evolution Park - An Evolutionary Robotics Habitat for the Study of Crawling, Swimming and Flying Creatures," National Science Foundation, \$305,000, 4/1/2011 - 3/31/2014 (PI: P. McKinley; Other Co-PI: J. Boughman)
48. PI, "RAPID: Monitoring of Gulf Oil Spill with Gliding Robotic Fish," National Science Foundation, \$110,000, 9/15/2010 - 2/28/2013
49. Co-PI, "Exploiting Mobility-assisted Collaboration for Adaptive Aquatic Sensor Networks," National Science Foundation, \$360,000, 9/15/2010 - 8/31/2013 (PI: G. Xing)
50. PI, "RI: Small: AquaSWARM: Small Wireless Autonomous Robots for Monitoring of Aquatic Environments," National Science Foundation, \$433,999, 9/1/2009 - 8/31/2014 (Co-PI: E. Litchman)
51. PI, "RET Site on Bio-Inspired Technology and Systems (BITS)," National Science Foundation, \$500,000, 9/1/2009 - 8/31/2012 (Co-PIs: E. Alcolija, A. Kim)
52. PI, "Nonlinear and Adaptive Control of Smart Material-Actuated Systems with Application to Nanopositioning," National Science Foundation, \$216,000, 8/15/2008 - 7/31/2012 (Co-PI: H. K. Khalil)
53. Co-PI, "ORCHID: Harnessing Digital Evolution to Design High-Assurance Adaptive Systems," National Science Foundation, \$600,000, 7/1/2008 - 6/30/2013 (PI: B. H. Cheng; Other Co-PIs: P. K. McKenley, and C. A. Ofria)
54. PI, "Highly Maneuverable Robotic Fish Based on Biological Principles and Biomimetic Materials," Office of Naval Research, \$379,748, 6/1/2008 - 12/31/2011
55. Co-PI, "CRI: IAD - A Testbed for Evolving Adaptive and Cooperative Behavior Among Autonomous Systems," National Science Foundation, \$188,110, 5/1/2008 - 4/30/2010 (PI: P. K. McKinley; Other Co-PIs: B. H. Cheng, C. A. Ofria, and R. T. Pennock)
56. PI, "Modeling and Control of Self-sensing Artificial Muscles," US Civilian Research & Development Foundation, \$9,400, 1/1/2008 - 12/31/2009
57. PI, "CAREER: Dexterous Biomimetic Micromanipulation Using Artificial Muscles: Modeling, Sensing, and Control," National Science Foundation, \$625,687, 3/1/2006 - 2/28/2013
58. PI, "SGER: A Control-Oriented Model for Ionic Polymer-Metal Composite Actuators," National Science Foundation, \$27,084, 9/15/2005 - 5/31/2006
59. PI, Educational Grant in Optical Science and Engineering, The International Society for Optical Engineering, \$2,000, 8/29/2005 - 8/28/2006

Internal Funding

1. PI, MSU match to NSF NRT grant, "NRT-HDR: WaterCube: Big Data Water Science for Sustainability and Equity," MSU Office for Research and Innovation and The Graduate School, \$767,164, 8/16/2024-8/15/2029 (Co-PIs: M. S. Phanikumar, P. Tan, J. B. Rose, S. P. Gasteyer, Y. Pokhrel, C. M. Wagner, J. Carrera)

2. PI, "Evolvability of Markov Brain Controllers for Soft Robots," BEACON Center (an NSF Science and Technology Center headquartered at MSU), \$44,472, 8/16/2018 - 12/31/2019 (Co-PI: C. Adami)
3. PI, "Soft Robotic Systems for Safe and Accurate Medical Diagnosis and Intervention," MSU Foundation, \$400,000 (with additional \$80,000 match from colleges/departments), 7/1/2017 - 6/30/2021 (Co-PIs: T. Gao, J. Kruger, C. Qian, and C. Wang)
4. PI, "Gliding Robotic Fish for Underwater Sensing," MSU Foundation/Spartan Innovations, \$66,723, 8/16/2013 - 12/31/2014
5. Co-PI, "Brain-Body Coupling in Soft Robotics," MSU Discretionary Funding Initiative, \$45,286, 11/14/2013 - 6/30/2015 (PI: P. McKinley)
6. PI, "Robotic Fish Patent Scope," MSU-TSGTD, \$7,000, 7/1/2013 - 10/31/2013 (Co-PI: R. DeVito)
7. Co-PI, "Reliable Detection of Objects with a Collection of Artificial Lateral Lines," BEACON Center (an NSF Science and Technology Center headquartered at MSU), \$59,320, 8/16/2015 - 8/15/2016 (PI: K. Deb)
8. PI, "Robust Multi-objective Evolutionary Design of Artificial Lateral Line Systems," BEACON Center (an NSF Science and Technology Center headquartered at MSU), \$87,866, 5/16/2014 - 5/15/2015 (Co-PI: K. Deb)
9. PI, "Evolutionary Design of Artificial Lateral Line Systems," BEACON Center (an NSF Science and Technology Center headquartered at MSU), \$88,618, 8/16/2013 - 5/15/2014 (Co-PI: K. Deb)
10. PI, "Understanding and Synthesizing Collective Behavior with Mixed Robotic and Live Fish Schools," BEACON Center (an NSF Science and Technology Center headquartered at MSU), \$169,923, 5/16/2012 - 8/15/2013 (Co-PIs: P. McKinley and J. Boughman)
11. PI, "Exploiting Robot-Fish Interactions and Evolutionary Computing to Understand and Synthesize Complex Collective Behavior," BEACON Center (an NSF Science and Technology Center headquartered at MSU), \$75,684, 5/16/2011- 5/15/2012 (Co-PIs: P. McKinley and J. Boughman)
12. PI, "Evolving Robotic Fish toward Autonomous Schools," BEACON Center (an NSF Science and Technology Center headquartered at MSU), funded one graduate research assistant + \$3,000 for an hourly undergrad, 8/16/2010 - 5/15/2011 (Co-PIs: P. McKinley and J. Boughman)
13. Co-PI, "Development of An Autonomous Robotic Fish-based Sensor to Detect Harmful Algal Blooms (HABs)," Biogeochemistry Environmental Research Initiative (BERI) at MSU, \$10,000, Spring 2009 (PI: E. Litchman)
14. PI, "Integrated Sensory Feedback for Artificial Muscles," Michigan State University Intramural Research Grants Program, \$50,000, 12/15/2005 - 12/31/2007

TEACHING

1. EGR 100 (Member of instructional team), *Introduction to Engineering Design* (Fall 2007 - Spring 2011)
2. ECE 313, *Control Systems* (Fall of 2004 – 2007, 2009, Spring of 2009, 2011 – 2014, 2016, 2019, 2025)
3. ECE 416, *Digital Control* (Spring 2023)
4. ECE 480 (Facilitator), *Senior Design* (Fall 2005, Spring 2006, Spring 2012 [First Place in Design Day competition], Spring 2016, Spring 2017, Fall 2017, Fall 2018, Spring 2019, Fall 2019m Fall 2020)
5. ECE 819, *Smart Material Sensors and Actuators* (Fall of 2011, 2014, 2017, 2019, 2021, 2023); also offered as ECE 802-602 (Spring 2008) and ECE 802-603 (Spring 2005, *Smart Sensors and Actuators in Micro and Nanosystems*) [A course developed by X. Tan]

6. ECE/ME 856, *Adaptive Control* (Fall of 2008, 2010, 2013, 2016, 2020, 2024); also offered as ECE 960A (Spring 2006)
7. ECE 960C, *Networked and Embedded Control Systems* (Spring 2010, Fall 2015, Fall 2018); also offered as ECE 802-603 (Spring 2007) [A course developed by X. Tan]

INVENTIONS (Superscript [#] indicates Dr. Tan's advisee)

- [P-1] **X. Tan**, H. Shi[#], N. Sepulveda, C. Chen[#], and Y. Mei[#], "Soft pressure sensor array," U.S. Patent Application 18/378,230, filed on October 10, 2023
- [P-2] **X. Tan**, H. Shi[#], and C. Luedtke[#], "Amphibious robotic snake," U.S. Patent Application 18/084,385, filed on December 19, 2022
- [P-3] C. Cao, **X. Tan**, Y. Pang, and S. Chen, "Soft gripper apparatus," U.S. Patent Application 17/515,628, filed on November 1, 2021
- [P-4] **X. Tan** and M. Al-Rubaiai[#], "Flexible sensor," U.S. Patent 12,055,449 B2, issued on August 6, 2024
- [P-5] **X. Tan**, T. Pinto[#], D. Coleman[#], W. Hou, S. Matt, S. Restaino, F. Santiago, and H. Shi[#], "Apparatus with a controllable surface for underwater boundary flow," U.S. Patent 11,643,169 B2, issued on May 9, 2023
- [P-6] **X. Tan**, F. Zhang[#], J. Wang[#], and J. Thon[#], "Gliding robotic fish navigation and propulsion," U.S. Patent 10,589,829 B2, issued on March 17, 2020
- [P-7] G. Zhu, **X. Tan**, and L. D. Hung, "Electroactive polymer-based flow sensor," U.S. Patent 9,903,788 B2, issued on February 27, 2018
- [P-8] **X. Tan**, F. Zhang[#], J. Wang[#], and J. Thon[#], "Gliding robotic fish navigation and propulsion," U.S. Patent 9,718,523 B2, issued on August 1, 2017
- [P-9] **X. Tan**, N. Xi, Z. Chen[#], and Y. Shen, "Integrated actuator sensor structure," U.S. Patent 7,982,375, issued on July 19, 2011

PUBLICATIONS (Superscript [#] indicates Dr. Tan's advisee)

Book:

- [B-1] K. J. Kim, **X. Tan**, H. R. Choi, and D. Pugal, *Biomimetic Robotic Artificial Muscles*, World Scientific Publishing, 2013

Book Chapters:

- [BC-1] K. Kim, V. Palmre, D. Pugal, T. Stalbaum, Z. Chen, **X. Tan**, and M. Yamakita, "IPMCs as EAPs: Models," F. Carpi, editor, *Electromechanically Active Polymers: A Concise Reference*, pp. 171-190, Chapter 8, Springer International Publishing, Cham, Switzerland, 2016
- [BC-2] H. Lei[#] and **X. Tan**, "Modeling of environment-dependent IPMC actuation and sensing dynamics," M. Shahinpoor, editor, *Ionic Polymer Metal Composites (IPMCs): Smart Multi-Functional Materials and Artificial Muscles*, pp. 334-353, Chapter 10, Royal Society of Chemistry, Cambridge, UK, 2015
- [BC-3] Z. Chen, H. Bart-Smith, and **X. Tan**, "IPMC-actuated robotic fish," R. Du, Z. Li, K. Youcef-Toumi, P. V. Alvarado, editors, *Robot Fish: Bio-inspired Fishlike Underwater Robots*, pp. 219-253, Chapter 8, Springer-Verlag, Berlin, Heidelberg, 2015

[BC-4] **X. Tan** and J. S. Baras, “Optimal control of hysteresis in smart actuators: A viscosity solutions approach,” C. J. Tomlin, M. R. Greenstreet, editors, *the Springer series Lecture Notes in Computer Science (LNCS) Vol. 2289, Proceedings of the 5th International Workshop on Hybrid Systems: Computation and Control*, pp. 451-464, Springer-Verlag, Berlin, Heidelberg, 2002

Journal Papers:

- [J-1] E. Gaskell[‡] and **X. Tan**, “Optimal feedback control of an active drifter,” *IEEE Transactions on Control Systems Technology*, under review, 2024
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- [C-156] **X. Tan**, “Swarming control using parallel Gibbs sampling,” *Proceedings of the 2008 American Control Conference*, Seattle, WA, pp. 3701-3706, 2008
- [C-157] **X. Tan** and O. Bennani[#], “Fast inverse compensation of Preisach-type hysteresis operators using field-programmable gate arrays,” *Proceedings of the 2008 American Control Conference*, Seattle, WA, pp. 2365-2370, 2008
- [C-158] E. Mbemmo[#], Z. Chen[#], S. Shatar[#], and **X. Tan**, “Modeling of biomimetic robotic fish propelled by an ionic polymer-metal composite actuator,” *Proceedings of the 2008 IEEE International Conference on Robotics and Automation*, Pasadena, CA, pp. 689-694, 2008
- [C-159] S. Shatar[#], **X. Tan**, E. Mbemmo[#], and N. Gingery[#], “Experimental investigation on underwater acoustic ranging for small robotic fish,” *Proceedings of the 2008 IEEE International Conference on Robotics and Automation*, Pasadena, CA, pp. 712-717, 2008
- [C-160] Z. Chen[#] and **X. Tan**, “A scalable dynamic model for ionic polymer-metal composite actuators,” Y. Bar-Cohen, editor, *Electroactive Polymer Actuators and Devices (EAPAD) X, Proceedings of the SPIE*, vol. 6927, pp. 69270I (11 pp), 2008
- [C-161] Z. Chen[#], K. Kwon[#], and **X. Tan**, “Design of integrated IPMC/PVDF sensory actuator and its application to feedback control” (**Invited**), M. Tomizuka, editor, *Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems, Proceedings of the SPIE*, vol. 6932, pp. 69321O (12 pp), 2008
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- [C-167] J. Ahrens[#], **X. Tan**, and H. K. Khalil, “Multirate sampled-data output feedback control of smart material actuated systems” (**Invited**), *Proceedings of the American Control Conference*, New York, NY, pp. 4327-4332, 2007
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- [C-180] Z. Chen[#], **X. Tan**, and M. Shahinpoor, "Quasi-static positioning of ionic polymer-metal composite (IPMC) actuators," *Proceedings of the IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, Monterey, CA, pp. 60-65, 2005
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- [C-192] **X. Tan** and J. S. Baras, "Modeling and control of a magnetostrictive actuator," (**Finalist, Best Student Paper Award**), *Proceedings of the 41st IEEE Conference on Decision and Control*, Las Vegas, NV, pp. 866-872, 2002
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Other Conference Presentations:

1. **X. Tan**, “Electronic skin for safe robotic harvesting and handling of fruits and vegetables,” presentation at *the 2023 Great Lakes Expo: Fruit, Vegetable & Farm Market*, Grand Rapids, MI, 2023
2. E. M. Gaskell[#], T. R. Funnell (presenter), M. Holbrook, D. W. Hondorp, and **X. Tan**, “Detection efficiency using an unmanned surface vehicle as a mobile receiver platform,” presentation at *the American Fisheries Society 153rd Annual Meeting*, Grand Rapids, MI, 2023
3. P. Schulman[#] (presenter), S. Berndt, C. Roman, and **X. Tan**, “Computational fluid dynamics modeling analysis of a Martian rotorcraft with individual blade control,” presentation at *the 2023 Measurement, Estimation and Control Conference*, Lake Tahoe, NV, 2023
4. P. Fairchild[#] (presenter), N. Shephard, Y. Mei, and **X. Tan**, “Semi-physical modeling of soft pneumatic actuators with stiffness tuning,” presentation at *the 2023 Measurement, Estimation and Control Conference*, Lake Tahoe, NV, 2023
5. S. Matt (presenter), W. Hou, H. Shi[#], A. Thombs, and **X. Tan**, “Impact of active boundary modulation on near-boundary velocity in channel flow,” presentation at *2022 Ocean Science Meeting*, (virtual presentation), 2022
6. **X. Tan**, “Koopman operator-based data-driven modeling of robotic fish,” presentation at *Peng Cheng Lab Bio-inspired Underwater Robotics Workshop*, (virtual presentation), 2020
7. S. Matt (presenter), W. Hou, F. Santiago, S. Restaino, K. Sampath, H. Shi[#], T. Pinto[#], and **X. Tan**, “Boundary layer turbulence near actuated deformable membranes,” presentation at *SPIE Defense + Commercial Sensing (DCS) 2020 Digital Forum, Ocean Sensing and Monitoring XII*, 2020
8. X. Qi[#] (presenter), H. Shi[#], T. Pinto[#], and **X. Tan**, “A novel pneumatic soft snake robot using traveling-wave locomotion in constrained environments,” presentation at *2020 IEEE International Conference on Soft Robotics (RoboSoft)*, (virtual meeting), 2020
9. **X. Tan**, “Soft capacitive sensor array for spatial mapping of positive and negative pressures,” invited talk at *2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Workshop on Marine Bio-inspired Soft Robotics*, Macau, China, 2019
10. S. D. Bopardikar, O. Ennasr[#], and **X. Tan** (presenter), “Randomized sensor selection for nonlinear systems with application to target localization,” presentation at *2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Macau, China, 2019

11. **X. Tan**, “Underwater patrol with gliding robotic fish ‘Grace’,” invited talk at *2019 ASU Southwest Robotics Symposium*, Tempe, AZ, 2019
12. T. VanBuren, T. Pinto[#], J. Lucas, L. Nye, G. Pelled, and **X. Tan**, “Developing soft robotics exoskeleton and testing EMG as a potential biofeedback control,” poster presentation at *2018 Biomedical Engineering Society (BMES) Annual Meeting*, Atlanta, GA, 2018
13. M. Sharif[#] (presenter), M. McHenry, and **X. Tan**, “The role of morphology in sensitivity of artificial lateral lines,” invited talk at *2018 American Mathematical Society (AMS) Fall Central Sectional Meeting*, Ann Arbor, MI, 2018
14. **X. Tan**, “Hydrodynamic object localization and tracking with an IPMC artificial lateral line,” invited talk at *Symposium 3: Modeling, Simulation, and Control of Adaptive Systems, ASME 2014 Conference on Smart Materials, Adaptive Structures and Intelligent Systems*, Newport, Rhode Island, 2014
15. **X. Tan**, “Parylene-encapsulated IPMC sensors and application to flow sensing in underwater robots,” invited talk at *Workshop on Soft Robotics/Active Skins and Related Technologies*, University of Nevada, Las Vegas, 2014
16. F. Zhang[#] (presenter) and **X. Tan**, “Gliding robotic fish: A highly maneuverable and energy-efficient platform for aquatic sensing,” invited talk at *the 2013 SIAM Conference on Control and Its Applications*, San Diego, CA, 2013
17. **X. Tan**, “Soft actuation materials capable of complex deformation,” invited talk at *Workshop on Biologically-Inspired Actuation*, at *the 2011 IEEE International Conference on Robotics and Automation*, Shanghai, China, 2011
18. **X. Tan**, “Linking university research to K-12 education,” oral presentation at *the 3rd Annual Internationalizing Michigan Education Conference: Where Globalization Meets School Improvement: Linking and Learning with Schools around the World*, East Lansing, MI, 2009
19. **X. Tan** (presenter) and O. Bennani[#], “Embedded inverse compensation of hysteresis in smart material actuators,” invited talk at *the 13th International Symposium on Applied Electromagnetics and Mechanics*, East Lansing, MI, 2007
20. Y. Fang[#], **X. Tan** (presenter), and G. Alici, “Robust adaptive control of conjugated polymer actuators,” invited talk at *the SIAM Conference on Control and Its Applications*, San Francisco, CA, 2007
21. Z. Chen[#] and **X. Tan**, “A dynamic sensing model for ionic polymer metal composites,” poster presentation at *Red Raider Mini-Symposium Series: Mathematical Modeling of Novel Materials and Devices*, Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX, 2006
22. **X. Tan**, “Almost symplectic Runge-Kutta schemes for Hamiltonian systems,” invited talk at *the 6th SIAM Conference on Control and Its Applications*, New Orleans, LA, 2005
23. **X. Tan**, “Preisach operator-based modeling and control of hysteresis in magnetostrictive actuators” (**Invited**), oral presentation at *the 6th SIAM Conference on Control and Its Applications*, New Orleans, LA, 2005
24. R. V. Iyer (presenter), **X. Tan**, and P. S. Krishnaprasad, “Approximate inversion of the Preisach hysteresis operator with application to control of smart actuators,” oral presentation at *the AMS 2005 Spring Central Section Meeting*, Lubbock, TX, 2005
25. M. Khbeis, **X. Tan (presenter)**, G. Metze, and R. Ghodssi, “Microfabrication of a pressure sensor array using 3D integration technology,” oral presentation at *the American Vacuum Society’s 50th International Symposium*, Baltimore, MD, 2003
26. M. Khbeis and **X. Tan**, “Microfabrication of a pressure sensor array using 3D integration technology”, (**Best Poster Award**), poster presentation at *MEMS Alliance Special Topics Symposium: Materials and Fabrication Technologies for MEMS and NEMS*, College Park, MD, 2003

27. N. Ghalichechian, M. Khbeis, Z. Ma, S. Moghaddam, and **X. Tan**, “A piezoresistive pressure sensor cluster”, poster presentation at *MEMS Alliance Special Topics Symposium: MEMS Technologies in Biotech and Commercial Applications*, The Johns Hopkins University Applied Physics Laboratory, 2002
28. P. S. Krishnaprasad (presenter) and **X. Tan**, “Cayley Transforms in Magnetism,” oral presentation at *the 5th SIAM Conference on Control and Its Applications*, San Diego, CA, 2001
29. **X. Tan (presenter)**, J. S. Baras, and P. S. Krishnaprasad, “Computational micromagnetics for magnetostrictive actuators,” oral presentation at *the 3rd SIAM Conference on Mathematical Aspects of Materials Science*, Philadelphia, PA, 2000

INVITED FULL-HOUR TALKS

1. “Stalking vampires of the Great Lakes: Smart e-skin technology for monitoring invasive sea lamprey,” Department of Electrical and Computer Engineering Seminar Lecture Series, University of Rochester, NY, November 20, 2024
2. “Control of underwater robots with localization constraints,” Byron Short Seminar, Walker Department of Mechanical Engineering, University of Texas, Austin, TX, October 18, 2024
3. “Stalking vampires of the Great Lakes: Smart sensors and robots for sea lamprey control,” Department of Mechanical Engineering Distinguished Seminar Series, University of Houston, Houston, TX, September 14, 2023
4. “Sea lampreys, e-skin, and robotic fish: Mechatronic solutions to invasive species control,” Plenary Talk, 2023 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Seattle, WA, June 30, 2023
5. “Exploring the underwater world: Learning from fish and beyond,” Department of Electrical, Computer, and Systems Engineering Colloquium Series, Case Western Research University, Cleveland, OH, September 22, 2022
6. “Fish and robot: Bio-inspiration, underwater sensing, and the role of dynamics and control,” Semi-Plenary Talk, 2022 American Control Conference, Atlanta, GA, June 9, 2022
7. “Modeling and control of hysteresis using minimal representations,” Control and Optimization Seminar, Department of Mathematics, Louisiana State University, April 22, 2022
8. “Modeling and control of hysteresis in smart material actuators using minimal representations,” Plenary Talk, 2022 IEEE 17th International Conference on Advanced Motion Control, Padova, Italy, (virtual presentation), February 18, 2022
9. “Gliding robotic fish: Make ‘sense’ of the underwater world,” School of Engineering Research Seminar, the University of Kansas, November 12, 2021
10. “Robotic fish: Bio-inspiration, autonomous sensing, and the role of dynamics and control,” Department of Mechanical Engineering, Florida Institute of Technology, (virtual presentation), October 15, 2021
11. “Robotic fish: Make ‘sense’ of the underwater world,” Department of Mechanical Engineering, Texas Tech University, Lubbock, TX, (virtual presentation), November 16, 2020
12. “Robotic fish: Make ‘sense’ of the underwater world,” Department of Mechanical Engineering, University of California, Santa Barbara, (virtual presentation), November 9, 2020
13. “Robotic fish: Make ‘sense’ of the underwater world,” Plenary talk, 2020 ASME Dynamic Systems and Control Conference, (virtual presentation), October 6, 2020
14. “Prandtl-Ishlinskii hysteresis model: Seeking simplest representations,” University of Macau, Macau, China, November 6, 2019

15. "Towards soft machines: Printing-based fabrication of enabling elements for soft robots," Nanjing Agricultural University, Nanjing, China, June 24, 2019
16. "Towards soft machines: Printing-based fabrication of enabling elements for soft robots," Southeast University, Nanjing, China, June 24, 2019
17. "Underwater patrol: A tale about gliding robotic fish 'GRACE'," The Booz Allen Hamilton Distinguished Colloquium Series, Department of Electrical and Computer Engineering, University of Maryland, College Park, MD, November 30, 2018
18. "Model reduction for hysteresis operators," Nanjing University of Post and Telecommunication, Nanjing, China, April 20, 2018.
19. "Model reduction for hysteresis operators," Department of Automation, Tsinghua University, Beijing, China, April 26, 2018
20. "Underwater patrol: Gliding robotic fish and their environmental sensing applications," Mechanical Engineering Department, Colorado State University, Fort Collins, March 6, 2018
21. "Underwater patrol: Gliding robotic fish and their environmental sensing applications," Oakland University, Rochester, MI, March 30, 2018
22. "Model reduction for hysteresis operators," Joint Model-Based Systems Engineering Colloquium and UTRC Control and Dynamical Systems Lecture, University of Maryland, College Park, MD, November 17, 2017
23. "Gliding robotic fish: Make 'sense' of the underwater world," Department of Mechanical Engineering, Colorado School of Mines, Golden, CO, September 26, 2017
24. "Gliding robotic fish: Make 'sense' of the underwater world," Department of Mechanical Engineering, University of Utah, Salt Lake City, UT, September 18, 2017
25. "Underwater sensing with gliding robotic fish," Department of Electrical & Computer Engineering, University of Windsor, Windsor, Canada, November 4, 2016
26. "'Falling with style' – Gliding robotic fish patrol waters with ease," College of Engineering, Peking University, Beijing, China, April 24, 2015
27. "'Falling with style' – Gliding robotic fish patrol waters with ease," Department of Automation, Tsinghua University, Beijing, China, April 23, 2015
28. "'Falling with style' – Gliding robotic fish patrol waters with ease," Frontiers in Control Science and Engineering Seminar Series, Tongji University, Shanghai, China, April 21, 2015
29. "'Falling with style' – Gliding robotic fish patrol waters with ease," School of Automation, Nanjing University of Posts and Telecommunications, Nanjing, China, April 17, 2015
30. "Soft sensing and actuation materials: A systems perspective to bridge material physics and applications," School of Mechanical Engineering, Purdue University, West Lafayette, IN, March 2, 2015
31. "'Falling with style' – Gliding robotic fish patrol waters with ease," Department of Mechanical Engineering, Virginia Tech, Blacksburg, VA, February 23, 2015
32. "(Gliding) robotic fish: Swim or not swim," Control Seminar Series, University of Michigan, Ann Arbor, MI, February 13, 2015
33. "(Gliding) robotic fish: Swim or not swim," Systems and Control Seminar Series, Georgia Tech, Atlanta, GA, November 18, 2014
34. "(Gliding) robotic fish: Swim or not swim," Maryland Robotics Center Seminar Series, University of Maryland, College Park, MD, September 10, 2014

35. "Toward autonomous robotic fish schools: Challenges and potential solutions," CSE Lecture Series, Department of Computer Science and Engineering, Michigan State University, East Lansing, MI, April 22, 2011
36. "Soft sensing and actuation materials: A systems perspective," Workshop on Future Directions in Applied Mathematics, Center for Research in Scientific Computation, North Carolina State University, Raleigh, NC, March 10, 2011
37. "Conjugated polymer actuators: Modeling, control, and device applications," Control Theory Seminar Series, Department of Applied Mathematics, University of Waterloo, Canada, October 15, 2010
38. "Robotic fish: From bio-inspired design to environmental monitoring," Harvard University, Cambridge, MA, September 13, 2010
39. "Robotic fish: From bio-inspired design to environmental monitoring," Institute for Bio-inspired Structure and Surface Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China, June 10, 2010
40. "Robotic fish: Bio-inspired design, modeling, and applications," Engineering Alliance Seminar Series, Georgia Tech, Savannah, GA, March 3, 2010
41. "Electroactive polymers as artificial muscles and sensors: A systems perspective," Cymer Center for Control Systems and Dynamics, University of California, San Diego, CA, March 13, 2009
42. "Electroactive polymers as artificial muscles and sensors: A systems perspective," Department of Mechanical Engineering, Ohio State University, Columbus, OH, January 9, 2009
43. "Electroactive polymers as artificial muscles and sensors: A systems perspective," Robotics, Controls and Mechatronics Colloquium, University of Washington, Seattle, WA, October 31, 2008
44. "Adaptive embedded compensation of hysteresis in smart material actuators," Servo Technology, Western Digital Corporation, Lake Forest, CA, March 11, 2008
45. "Control of hysteresis nonlinearity in smart material systems," Control Science Center of Excellence, Air Force Research Laboratory, Wright-Patterson AFB, OH, July 2, 2007 [Joint presentation with Prof. H. K. Khalil]
46. "Electroactive polymers as artificial muscles and sensors: Modeling, control, and robotic applications," Institute of Modern Agriculture Science and Engineering, Tongji University, Shanghai, China, May 29, 2007
47. "Electroactive polymers as artificial muscles and sensors: A control systems perspective," Department of Civil and Environmental Engineering, University of Michigan, Ann Arbor, MI, December 1, 2006
48. "Electroactive polymers as artificial muscles and sensors: A control systems perspective," Red Raider Mini-Symposium Series (**Outstanding Early-Career Speaker**), Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX, November 10, 2006
49. "Electroactive polymers as artificial muscles and sensors: A control systems perspective," Center for Information and Systems Engineering, Boston University, Boston, MA, November 3, 2006
50. "Electroactive polymers as artificial muscles and sensors: A control systems perspective," Department of Mechanical Engineering, Michigan State University, East Lansing, MI, October 24, 2006,
51. "Modeling and control of hysteresis in smart materials," Beijing University of Aeronautics and Astronautics, Beijing, China, October 12, 2006
52. "Electroactive polymers as artificial muscles and sensors: A control systems perspective," Beijing University of Aeronautics and Astronautics, Beijing, China, October 12, 2006
53. "Modeling and control of smart material actuators," Mechanical Engineering Department Seminar, University of Nevada, Reno, NV, April 14, 2006

54. “Modeling and control of hysteresis in smart materials,” Center for Advanced Control Technologies Seminar, Cleveland State University, Cleveland, OH, October 28, 2005
55. “Modeling and control of hysteresis in smart materials,” Applied Mathematics Seminar, Michigan State University, East Lansing, MI, April 7, 2005
56. “Almost symplectic Runge-Kutta schemes for Hamiltonian systems,” Applied and Interdisciplinary Mathematics Seminar, University of Michigan, Ann Arbor, MI, March 18, 2005
57. “Modeling and control of hysteresis in smart materials,” Control Seminar Series, University of Michigan, Ann Arbor, MI, November 12, 2004
58. “Modeling and control of hysteresis in smart materials,” Small Smart Systems Center, University of Maryland, College Park, MD, February 20, 2004
59. “Modeling and control of hysteresis in smart materials,” Department of Electrical and Computer Engineering, Michigan State University, East Lansing, MI, February 9, 2004
60. “Structure-preserving numerical integrators for Hamiltonian systems,” ISR Student-Faculty Colloquium, Institute for Systems Research, University of Maryland, College Park, MD, May 13, 2003

PUBLIC LECTURES AND PODCASTS

1. “Soft Robotics with Xiaobo Tan,” *Soft Robotics Podcast*, IEEE Soft Robotics Technical Committee, September 4, 2020
2. “Robofish: Make ‘sense’ of the underwater world,” AAAS, in celebration of the launch of journal *Science Robotics* and part of 2016-2017 Halcyon Dialogues on Robotics, Washington, DC, June 16, 2017
3. “Robofish: Make ‘sense’ of water,” Michigan State University, *Speaking of Water* in celebration of World Water Day, East Lansing, MI, March 22, 2017

MEDIA COVERAGE

1. “This robot could find nitrate hot spots by crawling through tile drainage,” *Iowa Capital Dispatch*, by Cami Koons, December 26, 2024
2. “MSU Engineering professor elected TMECH editor-in-chief,” *MSU Today*, by Maggie Dillon, September 19, 2024
3. “MSU leads project hailed as ‘Holy Grail’ of invasive species control,” *MSU Today*, by Bethany Mauger, July 31, 2024
4. “MSU: More trained leaders needed to solve global water crisis,” *MSU Today*, by Kim Ward, September 22, 2023
5. “Soft robotics is about more than building robots,” *ACM News*, by Cari Shane, June 16, 2022
6. “MSU Researchers find “E-fish-ent” way to study fresh water life – Robot monitors water pollution, tracks tagged animals and more,” *WILX News 10*, by Claudia Sella, November 10, 2021

Related coverage:

- “MSU to test robot fish in Eaton County,” *WILX News 10*, by Nicole Buchmann, November 9, 2021
7. “Using sea lamprey’s natural instincts against them,” *MSU Today*, by Emilie Lorditch, August 9, 2021

Related coverage:

- “MSU researchers developing technology to take action against invasive sea lampreys,” *WKAR*, by McKoy Scribner, August 10, 2021
8. “Building soft robots to lend a helping hand (or four),” *MSU Today*, by Matt Davenport, November 10, 2020
 9. “Powerful human-like hands create safer human-robotics interactions,” *MSU Today*, by Adrian de Novato, Caroline Brooks, and Changyong Cao, July 20, 2020
 10. “Using robots to assist neurological impairment recovery,” *MSU Today*, by Patrick Hayes, Patricia Mroczek, and Caroline Brooks, June 23, 2020
 11. “No bones about it: Octopus may be the key to ‘smart prosthetics,’” *MSU Today*, by Kim Ward, April 29, 2020
 12. “E-skin technology could aid in sea lamprey fight,” *IJC Great Lakes Connection*, by Xiaobo Tan, January 2020 issue, 2020
 13. “‘Smart skin’ for sea lamprey detection,” *Lakes Letter*, by Xiaobo Tan, Fall 2019 issue, 2019
 14. “Grace 2.1 takes a swim in Higgins Lake,” *Houghton Lake Resorter*, by Thomas Reznich, November 23, 2017
 15. “MSU researchers improve underwater robotics with ‘GRACE,’” *WKAR Radio*, by Katie Cook, November 21, 2017
 16. “People in control: Xiaobo Tan,” *IEEE Control Systems Magazine*, vol. 37, no. 5, pp. 26-28, October 2017 issue
 17. “MSU uses grant to improve search-and-rescue missions with humans and robots,” *MSU Today*, by Ally Hamzey and Patricia Mroczek, September 8, 2017
 18. “Interdisciplinary panel dives into underwater robotics,” *AAAS*, by Juwon Song, June 22, 2017
 19. “Great Lakes scientists team up to track fish with GLATOS,” *Great Lakes Echo*, by Max Johnston, May 3, 2017
 20. “To track down bloodsucking lampreys, this robot swims like a fish,” *Motherboard*, by David Thaler, October 26, 2016
 21. “MSU Science Festival draws community crowd,” *the State News*, by Diamond Henry, April 20, 2016
 22. “MSU Night at the Museums makes splash with robotic fish,” *Lansing State Journal*, by R. J. Wolcott, April 14, 2016
 23. “Michigan State robotic fish dive deep,” *BTN LiveBIG*, January 13, 2016
 24. “Robofish gets a new mission: finding Nemo,” *MSU Today*, by Tom Oswald, September 24, 2014

Related coverage:

- “MSU’s robofish is getting an upgrade,” *WILX News 10*, by Ann Pierret, September 24, 2014
 - “Move over, Robocop. Robotic fish is here,” *Michigan Radio*, by Tracy Samilton, September 24, 2014
 - “US aids Michigan State to build better robofish,” *the Associated Press*, September 28, 2014
 - “MSU spawns ‘robofish’ to monitor Great Lakes,” *WKAR Radio*, October 17, 2014
25. “Faculty Voice: Xiaobo Tan: Robofish “Grace” takes a road trip,” *MSU Today*, by Xiaobo Tan, July 26, 2013
 26. “Robotics-themed program takes aim at science teaching,” *MSU Today*, by Tom Oswald, March 21, 2013

27. “Robofish GRACE glides with the greatest of ease,” *MSU Today*, by Tom Oswald, January 14, 2013

Related coverage:

- “Robo fish can glide (almost) forever,” *NBC News*, by John Roach, January 15, 2013
- “Submersible robotic fishoplane can swim for hundreds of kilometers,” *IEEE Spectrum*, by Evan Ackerman, January 17, 2013
- “A robotic fish to test our dirty waters,” *Scientific American*, by Ben Schiller, January 24, 2013
- “Face time: Xiaobo Tan, Robotic fish developer,” *the State News*, by Alex McClung, January 17, 2013
- Story covered by other media, such as *German Public Radio*, *Science Daily*, *FastCompany*, *Gizmag*, *Engadget*, and *Futurity*.

28. “Robotic fish patrol waters for pollutants,” *LiveScience*, by Xiaobo Tan, June 20, 2012

29. “Robotic fish search water for pollutants,” *Bloomberg TV* and *Planet Forward*, June 4, 2012

30. “Water-monitoring robofish almost ready to patrol Great Lakes,” *Great Lakes Echo*, by Jennifer Kalish, May 29, 2012

31. “Back to school: Robotic fish make a splash,” *Environmental Monitor*, by Kelly Blumenschein, April 3, 2012

32. “Robotic fish could monitor water quality,” NSF Highlights at *Science, Engineering, and Education Innovation (SEE Innovation)*, 2012

33. “A journey into Evolution Park: A new dimension,” *Currents Magazine*, by Laura Seeley, pp. 10-17, 2011-2012 issue

34. “New robotic fish detect harmful pollutants,” *The State News*, by Kelsie Thompson, September 22, 2011

35. “Synchronized swimming: Patrolling for pollution with robotic fish,” *Scientific American* guest blog, by Robin Smith, September 19, 2011

36. “Robofish wonder,” *Big Ten Network: MSU Today*, November 4 and 12, 2010

37. “MSU pushing robot development,” *the State News*, February 4, 2010

38. “Michigan State collaboration spawns robotic fish to monitor water quality,” *MSU News*, November 2, 2009

Related coverage:

- “MSU receives grant to develop robot fish,” *the State News*, November 3, 2009
- “NEMO’s new mission: Find toxic algae blooms,” *Capital News Service, MSU School of Journalism*, November 6, 2009
- “Robotic fish a step forward for zoologists: MSU-developed Tool Monitors Oxygen, Temperature in Water,” *Lansing State Journal*, December 26, 2009
- Story covered by online media: *US News and World Report*, *Scientific American*, *Science Daily*, *Great Lakes IT Report*, *Great Lakes Echo*, *Science 360 News Service*, and many others.

39. “Grant to expose teachers to research, translate excitement to classroom,” *MSU News*, August 6, 2009

Related coverage:

- “MSU assistant professor develops teacher-training program,” *the State News*, August 10, 2009
- “MSU gets grant for unique engineering program,” *Great Lakes IT Report*, August 7, 2009

40. "Making waves: Research explores uses for robotic fish," Cover story on *Networks* (MSU ECE magazine), Winter 2008/2009 issue
41. "Magnet brings toys to class," *the State News*, July 17, 2007
42. "Career plan links teaching, research," *MSU Today*, Summer 2006 issue

ADVISING

Completed PhD Degrees (Total: 22)

1. Jeff Ahrens (Principal advisor: Dr. Hassan Khalil), Ph.D., 2006. Dissertation: *Design and Performance Tradeoffs of High-Gain Observers with Applications to Smart Material Actuated Systems*. **Current position:** Senior Manager, IMS, Controls, and Measurements at Corning Incorporated.
2. Yang Fang, Ph.D., 2009. Dissertation: *Conjugated Polymer Actuators and Sensors: Modeling, Control, and Applications*. **Current position:** Founder and CEO, Beagle Technology Inc.
3. Zheng Chen, Ph.D., 2009. Dissertation: *Ionic Polymer-Metal Composite Artificial Muscles and Sensors: A Control Systems Perspective*. **Current position:** Bill D. Cook Associate Professor of Mechanical Engineering, University of Houston.
4. Ahmad T. Abdulsadda, Ph.D., 2012. Dissertation: *Artificial Lateral Line Systems for Feedback Control of Underwater Robots*. **Current position:** Associate Dean of Al Najaf Technical College and Al Furat Al Wast University, Iraq.
5. Alex Esbrook (Co-advisor: Dr. Hassan Khalil), Ph.D., 2012. Dissertation: *Control of Systems with Hysteresis Using Servocompensators*. **Current position:** Controls Engineer at Williams International.
6. Mohamed Edardar (Principal advisor: Dr. Hassan Khalil), Ph.D., 2013. Dissertation: *Robust Control of Systems with Piecewise Linear Hysteresis*. **Current position:** Associate Professor in Automatic Control Engineering at University of Tripoli, Libya.
7. Feitian Zhang, Ph.D., 2014. Dissertation: *Modeling, Design and Control of Gliding Robotic Fish*. **Current position:** Associate Professor of Advanced Manufacturing and Robotics at Peking University, China.
8. Jianxun Wang, Ph.D., 2014. Dissertation: *Robotic Fish: Development, Modeling, and Application to Mobile Sensing*. **Current position:** Hardware Engineering Manager at Google.
9. Hong Lei, Ph.D., 2015. Dissertation: *Modeling and Fabrication of Ionic Polymer-Metal Composite (IPMC) Sensors*. **Current position:** Professor at Hainan University, China.
10. Jun Zhang, Ph.D., 2015. Dissertation: *Modeling, Identification, and Control of Hysteretic Systems with Application to Vanadium Dioxide Microactuators*. **Current position:** Assistant Professor of Mechanical Engineering at University of Nevada, Reno.
11. Sanaz Behbahani, Ph.D., 2016. Dissertation: *Role of Flexibility in Robotic Fish*. **Current position:** Principal Machine Learning Engineer, PubMatic.
12. Montassar Sharif, Ph.D., 2019. Dissertation: *Ionic Polymer-Metal Composite (IPMC): Modeling and Bio-inspired Sensing Applications*. **Current position:** University Lecturer and Head of Electrical and Control Department, Technical Engineering College-Kirkuk, Northern Technical University, Iraq.
13. Osama Ennar, Ph.D., 2020. Dissertation: *Gliding Robotic Fish: Design, Collaborative Estimation, and Application to Underwater Sensing*. **Current position:** Robotics Research Engineer at Barron Associates, Inc.
14. Thassy Pinto (Co-advisor: Dr. Chris Adami), Ph.D., 2021. Dissertation: *Towards Proprioceptive Grasping with Soft Robotic Hands*. **Current position:** Robotics Test Engineer at Opentrons Labworks Inc.
15. Jason Greenberg, Ph.D., 2021. Dissertation: *Dynamic LED-based Optical Localization of a Mobile Robot*. **Current position:** Senior Software Engineer at Oceanering.

16. Pratap Bhanu Solanki, Ph.D., 2021. Dissertation: *Alignment Control for Optical Communication between Underwater Robots*. **Current position:** Senior Mechatronics Design Engineer at ASML.
17. Yasir Khudhair Al-Nadawi (Principal advisor: Dr. Hassan Khalil), Ph.D., 2021. Dissertation: *Robust Hysteresis Compensation for Nanopositioning Control*. **Current position:** Principal Research Engineer, Raytheon Technologies.
18. Maria L. Castano, Ph.D., 2021. Dissertation: *Nonlinear Control of Robotic Fish*. **Current position:** Senior Electrical Engineer at Johns Hopkins University Applied Physics Laboratory.
19. Mohammed Al-Rubaiai, Ph.D., 2021. Dissertation: *Enabling Soft Robotic Systems: New Solutions to Stiffness Tuning, Sensing, and Actuation Control*. **Current position:** Senior Robotics Hardware Engineer at Tesla.
20. Hongyang Shi, Ph.D., 2022. Dissertation: *Soft Pressure Sensing System with Application to Underwater Sea Lamprey Detection*. **Current position:** Senior Hardware Systems Engineer at PDF Solutions, Inc.
21. Demetris Coleman, Ph.D., 2024. Dissertation: *Gliding Robotic Fish: Control and Exploration under Localization Uncertainties*. **Current position:** Senior Professional Staff at Johns Hopkins University Applied Physics Laboratory, and Chief Technology Officer at Motmot Inc.
22. Xinda Qi, Ph.D., 2024. Dissertation: *Bio-inspired Soft Robots: Design, Modeling, and Control*. **Current position:** Applied Scientist II at Amazon Robotics.

Current PhD Advisees (Total: 9)

1. Shangyuan Yuan, Ph.D. program, August 2024 - present. Topic: Machine learning in robotics.
2. Xinyu Zhou, Ph.D. program, August 2023 - present. Topic: Soft robots for drainage pipe inspection.
3. Alexander George, Ph.D. program, January 2023 - present. Topic: Soft multi-modal sensors.
4. Claudia Chen, Ph.D. program, August 2022 - present. Topic: Soft electronic skin.
5. Paul Schulman, Ph.D. program, August 2022 - present. Topic: Control of Martian rotorcraft.
6. Mei Yu, Ph.D. program, August 2021 - present. Topic: Soft robotics.
7. Christian Luedtke, Ph.D. program, August 2021 - present. Topic: Soft robots for drainage pipe inspection.
8. Preston Fairchild, Ph.D. program, August 2020 - present. Topic: Soft robotic manipulator.
9. Eric Gaskell, Ph.D. program, August 2019 - present. Topic: Modeling and control of aquatic surface robots.

Completed M.S. Degrees (Total: 9)

1. Nathan Usher, M.S., 2007. Thesis: *Digital Low-Level Radio Frequency Control and Microphonics Mitigation of Superconducting Cavities*. **Current position:** RF Engineer at Ionetix Corporation.
2. Stephan Shatara, M.S., 2008. Thesis: *Development of Small Biomimetic Robotic Fish with Onboard Fine-Grained Localization*. **Current position:** Senior Advisor - Radio Engineering, Bell.
3. Dawn Hedgepeth, M.S., 2010. **Current position:** ISSO/SA, the Johns Hopkins University Applied Physics Laboratory.
4. Freddie Alequin-Ramos, M.S., 2011. **Current position:** Electrical Engineer at Dart Container.
5. Mohammed Al-Rubaiai, M.S., 2015. Thesis: *Design and Development of an LED-based Optical Communication System*. **Current position:** Haptic Soft Actuator Scientist at ByteDance.
6. Hussein Hasan, M.S. (Mechanical Engineering), 2015. Thesis: *Design, Development, and Modeling of a Wirelessly Charged Robotic Fish*. **Current position:** Lecturer, University of Thi Qar, Iraq.

7. Ali Abul, M.S. (Mechanical Engineering), 2015. Thesis: *Microbial Fuel Cells: Design, Control-oriented Modeling, and Experimental Results*. **Current position:** Manufacturing/Mechanical Engineer at Fiat Chrysler Automobiles (FCA).
8. Chandler Panetta, M.S., 2021. Thesis: *Network of Unmanned Surface Vehicles: Design and Application to Target Tracking*. **Current position:** Developmental Engineer, Air Force Research Laboratory, Rome, NY.
9. Pearce Reickert, M.S., 2021. **Current position:** Software Developer at Coherix.

Postdoctoral Advisees

1. Dr. Hong Lei, June 2015 - March 2016. Topic: Design and fabrication of electroactive polymer-based artificial lateral lines.
2. Dr. Mart Anton, August 2008 - June 2009. Topic: Computational fluid dynamics (CFD) modeling of robotic fish.

Exchange Student Advisees (Total: 9)

1. Rui Xu, Jilin University, China, October 2018 - September 2019. Topic: Modeling and control of hysteresis.
2. Siyang Yang, Hefei University of Technology, China, November 2017 - September 2018. Topic: Data-driven modeling and control of soft robots.
3. Lei Fang, Peking University, China, September 2014 - September 2015. Topic: Analysis and control of systems with hysteresis.
4. Yannick Kengne-Fotsing, University of Kaiserslautern, Germany, January 2011 - July 2011. Master's thesis: *Modeling and Control of Nonlinear Behavior of IPMC Actuators*.
5. Andres Hunt, Tartu University, Estonia, February 2008 - July 2008. Topic: Self-sensing ionic polymer-metal composite actuators.
6. Qingsong Hu, Tongji University, China, October 2007 - October 2008. Topic: Modeling of turning for robotic fish.
7. Stephan Henneberger, University of Kaiserslautern, Germany, August 2007 - February 2008. Study thesis: *A Sliding Discrete Fourier Transform (SDFT)-based Localization System for Small Fish Robots*.
8. Ernest Mbemmo, University of Kaiserslautern, Germany, January 2007 - September 2007. Master's thesis: *Design and Modeling of Biomimetic Robotic Fish Propelled by an IPMC*.
9. Alex Will, University of Kaiserslautern, Germany, May 2006 - September 2006. Study thesis: *Dynamic Sensing Model for Ionic Polymer Metal Composites*.

Visiting Scholar Advisees (Total: 5)

1. Prof. Miaolei Zhou, Jilin University, China, October 2018 - September 2020. Topic: Modeling and control of hysteresis.
2. Prof. Fengyu Xu, Nanjing University of Posts and Telecommunications, China, May 2016 - May 2017. Topic: Soft robotics.
3. Prof. Zhibin Li, Shenzhen Polytechnic University, China, August 2012 - February 2013. Topic: Dynamics and control of nanotube-based linear actuators.
4. Prof. Yan Shen, Chengdu University of Information Technology, China, August 2012 - August 2013. Topic: Coordination of robotic fish sensor networks subject to energy constraints.
5. Prof. Songlin Chen, Harbin Institute of Technology, China, February 2012 - February 2013. Topic: Design of nonlinear controllers for tail-actuated robotic fish.

Undergrad Research Advisees (Total: 80)

1. Janna Salera, August 2024 - present. Topic: 3D-printed strain sensor.
2. Kiara Gonzalez Almanzar, November 2023 - present. Topic: Programming.
3. Van-Dyck Adanuty, September 2023 - May 2024. Topic: Soft robotics.
4. Vedant Naik, August 2023 - present. Topic: Soft robotics.
5. Elise Wright, August 2023 - December 2023. Topic: Autonomous surface vehicle.
6. Prasanth Peddireddy, September 2022 - December 2022. Topic: Snake robot.
7. Vu Phi, September 2022 - December 2024. Topic: Soft robotic glove, autonomous surface vehicle.
8. Flynn A. Joseph, September 2022 - May 2024. Topic: Automated water sampler, soft robotics.
9. Isabella B. Engelman, September 2022 - October 2022. Topic: Automated parking.
10. Samuel Rabick, January 2022 - August 2022. Topic: Soft robotic arm.
11. Eli Reifenrath, August 2021 - May 2022. Topic: Underwater robotics.
12. Brian Kim, August 2021 - May 2022. Topic: Underwater robotics.
13. Shrey Kohli, August 2021 - April 2024. Topic: Visual inertial odometry, computer vision.
14. Matthew Russell, April 2021 - May 2023. Topic: Soft robotic glove.
15. Ryan Conley, September 2020 - May 2021. Topic: Underwater robotics.
16. Maxwell Verboncoeur, September 2020 - May 2023. Topic: Underwater robotics, autonomous vehicles.
17. Maxwell Stull, February 2020 - June 2020. Topic: Robotic drifter.
18. Jacob Blatt, August 2019 - May 2023. Topic: Soft sensors and systems.
19. Claudia Chen, August 2019 - May 2022. Topic: Soft robotics.
20. Samuel Zayko, June 2019 - August 2019. Topic: Embedded programming for underwater robots.
21. Austin Coha, May 2019 - May 2020. Topic: Underwater robotics.
22. Mia Gilreath, May 2019 - September 2019. Topic: Soft robotics.
23. Daniel Quinn, April 2019 - May 2019. Topic: Remotely operated underwater vehicle.
24. Shaswat Joshi, April 2019 - July 2019. Topic: Underwater robotics.
25. Ryan Radawiec, December 2018 - May 2019. Topic: Underwater robotics.
26. Samuel Melrose, November 2018 - May 2019. Topic: Soft robotic glove.
27. Thomas Bos, September 2018 - May 2020. Topic: Soft robotics and underwater robotics.
28. Joeshua Diaz Gonzalez, June 2018 - August 2018. Topic: Robotic sailboat.
29. Robert Billette, January 2018 - May 2019. Topic: Gliding robotic fish development.
30. Chandler Panetta, January 2018 - May 2019. Topic: Underwater robotics.
31. Brendan Luecker, September 2017 - January 2020. Topic: Underwater robotics.
32. Robin Onsay, September 2017 - December 2017; September 2018 - December 2018. Topic: Underwater imaging with robots.
33. Ruoxuan Jiang, July 2017 - August 2017. Topic: Robot Operating System (ROS) for gliding robotic fish.
34. Edwin J. A. Ortega, May 2017 - July 2017. Topic: Integration of cellular data module with robots.
35. Andres Aleman, May 2017 - July 2017. Topic: Circuit design for gliding robotic fish.
36. Thamer Yousef Alsghan, May 2017 - July 2017. Topic: Computer vision.
37. Paul Schulman, January 2017 - May 2019. Topic: Manufacturing of underwater robots.
38. Camille Emig, September 2016 - April 2018. Topic: Graphical user interface for gliding robotic fish.

39. Lucas Wolfe, May 2016 - December 2017. Topic: 3D printing of shape memory polymers, design of wave energy harvesters, and development of gliding robotic fish.
40. Sunho Choi, May 2016 - May 2017. Topic: Development of sample collection modules for underwater robots.
41. Hanish Mehta, May 2016 - August 2017. Topic: Development of remotely operated vehicles (ROV).
42. Yue Chen, May 2016 - December 2016. Topic: 3D printing of shape memory polymers.
43. Demetris Coleman, May 2016 - July 2016. Topic: Soft actuators.
44. Amin Almozal, May 2016 - July 2016. Topic: LED communication in 3D space.
45. James P. Staley, February 2016 - April 2016. Topic: Programming of a quadrotor drone.
46. Hanchen Xie, January 2016 - May 2017. Topic: Development of underwater robots.
47. Ryan Johnson, August 2014 - April 2018. Topic: Embedded programming of robots.
48. Tingyuan Zhang, May 2014 - April 2016. Topic: Design and fabrication of mechanical parts in gliding robotic fish.
49. Anthonios Doliotis, May 2015 - August 2015. Topic: Underwater acoustic communication with WHOI micromodems.
50. Yujie Hao, May 2014 - August 2014. Topic: Assembly, programming, and extension of an OpenROV platform.
51. Linghan Zeng, August 2014 - August 2014. Topic: Design and assembly of mechanical structures.
52. Suriya M. Pachaimuthu, May 2014 - July 2014. Topic: Design of wireless charging system for robotic fish.
53. Patrick Munoz, May 2014 - July 2014. Topic: Embedded programming of underwater robots.
54. Scott O'Connor, May 2013 - August 2014. Topic: Solar energy-harvesting systems for underwater robots.
55. Victoria Kane, May 2013 - July 2013. Topic: Design of passive joints for pectoral fins of robotic fish.
56. Mark Velez, July 2012 - December 2012. Topic: CAD design of robotic fish.
57. Zain Bhatti, May 2012 - July 2012. Topic: Rapid prototyping of robotic fish using 3D printing.
58. Juan Castro, May 2012 - July 2012. Topic: Graphical user interface for robotic fish systems.
59. Joseph Graves, May 2012 - July 2012. Topic: Limit cycles in dynamic hysteretic systems.
60. Kasra Dabiran, May 2012 - August 2012. Topic: Mechanical design of robotic fish.
61. Cody Thon, August 2011 - May 2016. Topic: Design and development of robotic fish and wave generators.
62. ChaiYong Lim, May 2011 - July 2012. Topic: Modeling of ionic polymer-metal composite sensors.
63. Osama En-Nasr, May 2011 - May 2013. Topic: Embedded systems for robotic fish.
64. Bin Tian, May 2011 - May 2013. Topic: Embedded system and optical communication for underwater robots.
65. Stephen England, November 2010 - May 2011. Topic: Embedded systems for robotic fish.
66. Felix Adisaputra, May 2010 - August 2010. Topic: Graphical user interface for robotic fish.
67. Michael Carpenter, May 2009 - October 2009. Topic: Robotic fish.
68. Matt Guibord, May 2009 - August 2009. Topic: Nanopositioning control.
69. Thomas Ganley, May 2009 - February 2010. Topic: Ionic polymer-metal composite sensors.
70. Alex Esbrook, May 2008 - December 2008. Topic: Collaborative control of multi-agent systems.
71. Chris Gliniecki, May 2008 - December 2008. Topic: Robotic fish.
72. Andrew Temme, October 2006 - April 2008. Topic: Electroactive polymer sensors.

73. Ki-Yong Kwon, August 2006 - December 2007. Topic: Integrated sensory feedback for ionic polymer-metal composite actuators.
74. Nate Gingery, May 2007 - August 2007. Topic: Localization of robotic fish.
75. Omar Bennani, January 2006 - December 2007. Topic: Embedded control of hysteretic systems.
76. Bryan Thomas, August 2006 - April 2007. Topic: Localization of robotic fish.
77. Roy Dong, August 2006 - April 2007, Topic: Robotic fish educational kit; January 2010 - May 2011, Topic: Modeling and control of ionic polymer-metal composite actuators.
78. Daniel Laboy, August 2005 - December 2006. Topic: Electroactive polymer-based robots.
79. Jason Malinak, May 2005 - March 2006. Topic: Integrated sensory feedback for ionic polymer-metal composite actuators.
80. Christopher Ziel, May 2005 - March 2006. Topic: Electroactive polymer sensors.

K-12 Teacher Advisees (Total: 10)

1. Kevin Mayes (East Lansing High School, East Lansing, MI), June 2024 - July 2024. Topic: Aquatic surface vehicle.
2. Becky Eyestone-Malbouef (Waverly Middle School, Lansing, MI), June 2023 - July 2023. Topic: Pressure sensor arrays.
3. Angela Burns (Waverly High School, Lansing, MI), June 2022 - July 2022. Topic: Soft pneumatic actuators.
4. Jeffry Parks (Waverly High School, Lansing, MI), June 2019 - July 2019. Topic: 3D-printed strain sensors.
5. Megan Stadt (Okemos High School, Okemos, MI), June 2018 - July 2018. Topic: 3D-printed capacitive sensors.
6. Lisa VanOrder (Perry Middle School, Perry, MI), June 2017 - August 2017. Topic: Solar charging system for gliding robotic fish.
7. Randall Heck (J. W. Sexton High School, Lansing, MI), June 2016 - July 2016. Topic: Fabrication of soft pneumatic actuators.
8. Dean Buggia (Okemos High School, Okemos, MI), June 2015 - July 2015. Topic: Solar cell systems for gliding robotic fish.
9. Sonya Ross (Cass Tech High School, Detroit, MI), June 2014 - August 2014, Topic: Simulation and experiments on robotic fish with pectoral fins. June 2015 - July 2015, Topic: Design and prototyping of electro-rheological fluids-based flexible fin with tunable stiffness.
10. John Thon (Holt Junior High School, Holt, MI), May 2008 - June 2019. Topic: Research on underwater robots and related curriculum development.

High School Student Advisees (Total: 15)

1. Aaron Liu, July 2024 - August 2024. Topic: Embedded control.
2. Matthew Gomez, June 2024 - July 2024. Topic: Soft twisting actuator.
3. Daniel Cui, June 2024 - August 2024. Topic: Soft robotics.
4. Alex Zhang, June 2023 - August 2023. Topic: Soft strain sensors.
5. Shriya Chahal, June 2023 - present. Topic: Soft robotic grippers.
6. Junseo Hong, June 2022 - December 2023. Topic: Soft snake robot.
7. Elena Papapolymerous, July 2022 - August 2022. Topic: Underwater robotics.
8. David Shi, June 2022 - August 2022. Topic: Soft snake robot.
9. Eric Li, June 2019 - August 2019. Topic: Remotely operated underwater vehicle.

10. Jaron Hsu, June 2018 - July 2018. Topic: Soft actuators.
11. Ari Bozann, July 2017 - December 2017. Topic: Robotics.
12. Jack Sparrow, June 2017 - August 2017. Topic: Underwater robotics.
13. Andrew Kim, June 2017 - August 2017. Topic: 3D-printed strain gauges.
14. Lexie Roberts, May 2015 - August 2017. Topic: Graphical user interface for robotic fish exhibit and gliding robotic fish; programming of a quadrotor drone.
15. Cody Thon, September 2009 - July 2011. Topic: Robotic fish.

Member of Completed Dissertation Committees (Total: 39)

1. Piyush Gupta (Advisor: Vaibhav Srivastava/ECE), Ph.D., 2023
2. Aakash Gupta (Advisor: Wei-Che Tai/ME), Ph.D., 2023
3. Xiao Zhang (Advisor: Li Xiao/CSE), Ph.D., 2023
4. Shoue Chen (Advisor: Euihark Lee/Packaging), Ph.D., 2023
5. Zi Li (Advisor: Yiming Deng/ECE), Ph.D., 2023
6. Shivam Bajaj (Advisor: Shaunak Bopardikar/ECE), Ph.D., 2023
7. Su Pang (Advisors: Hayder Radha and Daniel Morris/ECE), Ph.D., 2022
8. Abdullah Ahmad Alfehaid (Advisor: Hassan Khalil/ECE), Ph.D., 2021
9. Zahra Marvi (Advisor: Bahare Kiumarsi/ECE), Ph.D., 2021
10. Connor Boss (Advisor: Vaibhav Srivastava/ECE), Ph.D., 2021
11. Xiao Zeng (Advisor: Mi Zhang/ECE), Ph.D., 2021
12. Biyi Fang (Advisor: Mi Zhang/ECE), Ph.D., 2019
13. Abhinav Gaur (Advisor: Kalyanmoy Deb/ECE), Ph.D., 2019
14. Suihan Liu (Advisor: Dr. Rigoberto Burgeuno/CEE), Ph.D., 2019
15. Yu Cheng (Advisor: Dr. Lixin Dong/ECE), Ph.D., 2018
16. David Torres-Reyes (Advisor: Dr. Nelson Sepulveda/ECE), Ph.D., 2017
17. Mohammed Al-Qizwini (Advisor: Dr. Hayder Radha/ECE), Ph.D., 2017
18. Ali Ahrari (Advisor: Dr. Kalyanmoy Deb/ECE), Ph.D., 2016
19. Anthony Clark (Advisor: Dr. Philip McKinley/CSE), Ph.D., 2016
20. Bo Song (Advisor: Drs. Ning Xi & Lixin Dong/ECE), Ph.D., 2016
21. Chad Byers (Advisor: Dr. Betty Cheng/CSE), Ph.D., 2015
22. Jianguo Zhao (Advisor: Dr. Ning Xi/ECE), Ph.D., 2015
23. Randy Olson (Advisor: Dr. Chris Adami/MMG, CSE), Ph.D., 2015
24. Jared Moore (Advisor: Dr. Philip K. McKinley/CSE), Ph.D., 2015.
25. Yu Wang (Advisor: Dr. Guoliang Xing/CSE), Ph.D., 2015
26. Erik Fredericks (Advisor: Dr. Betty Cheng/CSE), Ph.D., 2015
27. Emmanuelle Merced (Advisor: Dr. Nelson Sepulveda/ECE), Ph.D., 2014
28. Erick Nieves (Advisor: Dr. Ning Xi/ECE), Ph.D., 2013
29. Almuatazbellah M. Boker (Advisor: Dr. Hassan Khalil/ECE), Ph.D., 2013
30. Andres Ramirez (Advisor: Dr. Betty Cheng/CSE), Ph.D., 2013
31. Brendan Vidmar (Advisor: Dr. Steve Shaw/ME), Ph.D., 2012
32. Chi Zhang (Advisor: Dr. Ning Xi/ECE), Ph.D., 2012
33. Stephen Pace (Advisor: Dr. Guoming Zhu/ME), Ph.D., 2011
34. Yunfei Xu (Advisor: Dr. Jongeun Choi/ME), Ph.D., 2011

35. Alexis Ball (Advisor: Dr. Hassan K. Khalil/ECE), Ph.D., 2011
36. Shahid Nazrulla (Advisor: Dr. Hassan K. Khalil/ECE), Ph.D., 2010
37. Hua Deng (Advisor: Dr. Thomas Pence/ME), Ph.D., 2009
38. Attaullah Memon (Advisor: Dr. Hassan K. Khalil/ECE), Ph.D., 2009
39. Li Sun (Advisor: Dr. Patrick Kwon/ME), Ph.D., 2009

Member of Completed M.S. Thesis Committees (Total: 16)

1. Md Towhidur Rahman (ME) (Advisor: Tong Gao/ME), M.S., 2021
2. Vishal Abhishek (ME) (Advisor: Vaibhav Srivastava/ECE), M.S., 2021
3. Yousef Gtat (Advisor: Andrew Mason/ECE), M.S., 2019
4. Charles S. Boling (Advisor: Andrew Mason/ECE), M.S., 2016
5. Abdullah Alfehaid (Advisor: Dr. Hassan K. Khalil/ECE), M.S., 2015
6. Steven Chao (Advisor: Dr. Daniel Morris/ECE), M.S., 2015
7. Stephanie Priess (Advisor: Dr. Hassan K. Khalil/ECE), M.S., 2014
8. Dagmara Wehr (Advisor: Dr. Guoming Zhu/ME-ECE), M.S., 2014
9. Huan Lin (Advisor: Dr. Ning Xi/ECE), M.S., 2012
10. Rachel Bou Serhal (Advisor: Dr. Hassan K. Khalil/ECE), M.S., 2011
11. Erin Bosch (Advisor: Dr. Randy Showerman/Department of Community, Agriculture, Recreation and Resource Studies), M.S., 2011
12. John Gregory (Advisor: Dr. Ning Xi/ECE), M.S., 2010
13. Rui Zhang (Advisor: Dr. Ning Xi/ECE), M.S., 2010
14. James Reynolds (Advisor: Dr. Hassan K. Khalil/ECE), M.S., 2007
15. Luma Vasiljevic (Advisor: Dr. Hassan K. Khalil/ECE), M.S., 2007
16. Tarik H. Kandil (Advisor: Dr. Hassan K. Khalil/ECE), M.S., 2005

PROFESSIONAL MEMBERSHIP AND SERVICE

Professional Membership

1. Fellow, Institute of Electrical and Electronics Engineers (IEEE)
2. Fellow, American Society of Mechanical Engineers (ASME)
3. Member, American Association for the Advancement of Science (AAAS)
4. Life Member, Asian American Academy of Science and Engineering (AAASE)

Service as Officer to Professional Societies

1. ASME Director, American Automatic Control Council (AACC), December 2023 - November 2025
2. ASME Director Alternate, American Automatic Control Council (AACC), December 2019 - November 2023
3. Member, Executive Committee, ASME Dynamic Systems and Control Division, 2019 - 2024
4. Member (2018, 2021), Treasurer (2019), Chair (2020), Management Committee for *IEEE/ASME Transactions on Mechatronics*
5. Treasurer, ASME Dynamic Systems and Control Division, 2015 - 2018
6. Liaison, IEEE Control Systems Society to IEEE Nanotechnology Council, 2012 - 2014
7. Chair (2014), Awards Chair (2015), Vice Chair (2013), Conference Activities Chair (2012), Secretary (2011), ASME DSCD Technical Committee on Mechatronics

Editorial Services

1. Senior Editor, *IEEE/ASME Transactions on Mechatronics*, January 2019 - December 2022
2. Associate Editor, *Automatica*, April 2008 - April 2020
3. Associate Editor, *International Journal of Intelligent Robotics and Applications*, November 2018 - present
4. Associate Editor, *International Journal of Advanced Robotic Systems*, December 2013 - July 2016
5. Technical Editor, *IEEE/ASME Transactions on Mechatronics*, February 2012 - July 2015
6. Guest Editor (with Drs. V. Vantsevich, S. Fish, D. Gorsich, M. Kumar, and J. Wang), *Journal of Dynamic Systems, Measurement and Control*, special issue on Unmanned Mobile Systems (Target publication: 2019)
7. Lead Guest Editor (with Drs. K. K. Leang and Z. Yin), *International Journal of Intelligent Robotics and Applications*, focused section on Advances in Soft Robotics (Issue 2, 2017)
8. Guest Editor (with Drs. G. Berselli and R. Vertechy), *Meccanica*, special issue on Soft Mechatronics: Mechanics and Multi-physics of Compliant Transducers (November 2015 issue)
9. Guest Editor (with Drs. M. Al Janaideh and M. Rakotondrabe), *IEEE/ASME Transactions on Mechatronics*, focused section on Hysteresis in Smart Mechatronic Systems: Modeling, Identification, and Control (December 2015 issue)
10. Guest Editor (with Drs. M. Kruusmaa, P. Fiorini, R. Madhavan, C. Laschi), *Robotics and Autonomous Systems*, special issue for selected papers from 15th International Conference on Advanced Robotics, 2011
11. Lead Guest Editor (with Dr. R. V. Iyer), *IEEE Control Systems Magazine*, special section on Modeling and Control of Hysteresis (February 2009 issue)
12. Member, ASME Dynamic Systems and Control Division (DSCD) Conference Editorial Board, 2011 - 2013
13. Member, IEEE Control Systems Society Conference Editorial Board, 2007 - 2010
14. Member, Editorial Board of *International Journal of Applied Electromagnetics and Mechanics*, for special issue of Proceedings of 13th International Symposium on Applied Electromagnetics and Mechanics (ISEM'2007)
15. Associate Editor, ISA Conference Editorial Board for American Control Conference (ACC'2005, 2006)

Operating Committee of Conferences

1. Technical Program Chair, Workshop on New Frontiers in Networked Dynamical Systems: Assured Learning, Communication and Control, College Park, MD, 2023
2. Lead Organizer, Workshop on Nonlinear Systems and Control (in celebration of Professor Hassan Khalil's retirement), East Lansing, MI, 2023
3. General Chair, 2023 American Control Conference (ACC'2023)
4. Awards Chair, 2021 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'2021)
5. Finance Chair, 2021 American Control Conference (ACC'2021)
6. Program Chair, 2020 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'2020)
7. General Chair, 2018 ASME Dynamic Systems and Control Conference (DSCC'2018)
8. Registration Chair, 2016 IEEE International Conference on Advanced Intelligent Mechatronics (AIM'2016)
9. Finance Chair, 2015 American Control Conference (ACC'2015)

10. Program Chair, the 15th International Conference on Advanced Robotics (ICAR'2011)

Conference Program/Organizing Committees

1. Senior Program Committee member, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020, 2021)
2. Program Committee member (Associate Editor at Large), American Control Conference (2019, 2021, 2025)
3. Program committee member, 57th IEEE Conference on Decision and Control, 2018
4. Organizing committee member, 7th Midwest Control and Game Theory Workshop, 2018
5. Technical program committee member, SmartAg International Symposium, East Lansing, MI, 2017
6. Advisory committee member, 2017 International Conference on Intelligent Robotics and Applications (ICIRA 2017)
7. Program committee member, Robotics: Science and Systems 2017 (RSS 2017)
8. Associate Editor, IEEE International Conference on Advanced Intelligent Mechatronics (AIM'16, AIM'17, AIM'19)
9. Mechatronics Track Chair, 2014 ASME Dynamic Systems and Control Conference (DSCC'14)
10. Program committee member/Associate Editor, 2014 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'14)
11. Program Co-chair/Associate Editor, 2013 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'13)
12. Technical program committee member, 7th ACM International Conference on Underwater Networks & Systems (WUWNet'12)
13. International program committee member, 2012 International Conference on Intelligent Robotics and Applications (ICIRA'2012)
14. Focused Session Chair, 2010 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'2010)
15. Program committee member, World Congress on Intelligent Control and Automation (WCICA'10, WCICA'12)
16. Program committee member, the 6th International Conference on Informatics in Control, Automation and Robotics (ICINCO'09)
17. Local Arrangement Chair, IEEE Nanotechnology Materials and Devices Conference (NMDC'09)
18. Organizing committee member and co-chair for poster sessions, 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'2009)
19. International program committee member, 2009 International Symposium on Intelligent Control (ISIC'2009)
20. Program committee member, American Control Conference (ACC'2008, ACC'2010, ACC'2016)
21. International program committee member, ASME/IEEE International Conference on Mechatronic and Embedded Systems and Applications (MESA'2007, MESA'2008, MESA'2010)
22. Organizing committee member and co-chair for poster sessions, IEEE International Conference on Robotics and Biomimetics (ROBIO'2008)
23. Organizing committee member, International Symposium on Applied Electromagnetics and Mechanics (ISEM'2007)
24. Program committee member, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'2006)
25. Organizing committee member & Co-chair for local arrangements and awards, IEEE International Conference on Electro/Information Technology (EIT'2006)

26. Program committee member, IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM'2005, AIM'2007, AIM'2011)

Organizer of Conference Sessions

1. Organizer (with Drs. Vishesh Vikas, Hunter Gilbert, and Jianguo Zhao), invited session on “Modeling, Control and Estimation of Soft Material and Continuous Systems,” American Control Conference, Toronto, Canada, 2024
2. Organizer (with Dr. Christopher Holbrook, Dr. Darryl Hondorp, Tyler Funnell, and Eric Gaskell), workshop on “How to Build an Unmanned Surface Vehicle as a Mobile Receiver for Acoustic Telemetry,” Great Lakes Acoustic Telemetry Observation System (GLATOS) Coordinating Meeting, Sarnia, ON, 2024
3. Organizer (with Dr. Vishesh Vikas), invited session on “Modeling, Control and Estimation of Soft Material Systems,” American Control Conference, San Diego, CA, 2023
4. Organizer (with Drs. Mohammad Al Janaideh and Micky Rakotondrabe), invited session on “Control of Systems with Hysteresis,” American Control Conference, Boston, MA, 2016
5. Co-organizer (with Drs. Mohammad Al Janaideh and Micky Rakotondrabe), invited session on “Modeling and Control of Smart Material Systems,” American Control Conference, Chicago, IL, 2015
6. Organizer (with Dr. Mohammad Al Janaideh), invited session on “Modeling, Analysis, and Control of Systems with Hysteresis,” American Control Conference, Portland, OR, 2014
7. Co-organizer (with Dr. Bayu Jayawardhana and Dr. David Naso), invited session on “Analysis and Control of Systems with Hysteresis,” 52nd IEEE Conference on Decision and Control, Florence, Italy, 2013
8. Co-organizer (with Dr. Michael Malisoff), minisymposium on “Marine Robotic Controls,” SIAM Conference on Control and Its Applications, San Diego, CA, 2013
9. Organizer (with Dr. Ram V. Iyer), invited session on “Modeling, Analysis, and Control of Systems with Hysteresis,” American Control Conference, Washington, DC, 2013
10. Organizer, invited session on “Electroactive Polymer Actuators and Sensors,” IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Montreal, Canada, 2010
11. Co-organizer (with Dr. Maurizio Porfiri), invited session on “Ionic Polymer-Metal Composite (IPMC) Sensors and Actuators,” 2nd Annual ASME Dynamic Systems and Control Conference, Hollywood, CA, 2009
12. Organizer, invited session on “Smart Materials”, International Symposium on Applied Electromagnetics and Mechanics, East Lansing, MI, 2007
13. Organizer (with Dr. Kwang J. Kim), invited session on “Electroactive Polymer Sensors and Actuators”, World Forum on Smart Materials and Smart Structures Technology, Chongqin & Nanjing, China, 2007
14. Organizer (with Dr. Ram V. Iyer), special session on “Modeling, Analysis and Control of Systems with Hysteresis”, American Control Conference, New York, NY, 2007

Conference Session Chair/Co-Chair

1. IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Boston, MA (2024, Session WeA06)
2. Moderator, panel “Duel or Coalition: Data-driven Control vs ‘Principled’ Control Theory Machinery,” Workshop on New Frontiers in Networked Dynamical Systems: Assured Learning, Communication and Control, College Park, MD (2023)
3. Moderator, panel/special session “ASME Dynamic Systems and Control Division: Past, Present and Future,” 2023 Modeling, Estimation and Control Conference, Lake Tahoe, NV (2023)
4. The 2022 IEEE 61st Conference on Decision and Control, Cancun, Mexico, 2022 (Session TuAT15)

5. ASME Dynamic Systems and Control Conference, Pittsburgh, PA, (virtual, 2020, session Unmanned Ground and Aerial Vehicles II)
6. IEEE/AIM International Conference on Advanced Intelligent Mechatronics, Boston, MA, (virtual, 2020, Plenary Session 2)
7. IEEE/RSJ International Conference on Intelligent Robots and Systems, Macau, China (2019, Session Localization I)
8. American Control Conference, Milwaukee, WI (2018, Session ThC13)
9. ASME Dynamic Systems and Control Conference, Tysons, VA (2017, Session 4-1)
10. ASME Conference on Smart Materials, Active Structures, and Intelligent Systems (SMASIS), Snowbird, UT (2017, Session Symposium 1-6)
11. IEEE Conference on Decision and Control, Las Vegas, NV (2016, Session TuA02)
12. ASME Dynamic Systems and Control Conference, Minneapolis, MN (2016, Session 14-2)
13. IEEE International Conference on Advanced Intelligent Robotics, Banff, Canada (2016, Session WeAT5)
14. American Control Conference, Boston, MA (2016, Session WeA19)
15. American Control Conference, Chicago, IL (2015, Session ThA17)
16. IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Wollongong, Australia (2013, Sessions WeCT5, ThAT3, FrBT5)
17. American Control Conference, Washington, DC (2013, Session TuB16)
18. The 15th International Conference on Advanced Robotics, Tallinn, Estonia (2011, Session WeB2)
19. IEEE International Conference on Robotics and Automation, Shanghai, China (2011, Sessions WeA107, WeP111)
20. IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Montreal, Canada (2010, Session WeA5)
21. IEEE/RSJ International Conference on Intelligent Robots and Systems, St. Louis, MO (2009, Sessions MoIIT6, TuIT2, TuIIT13)
22. American Control Conference, St. Louis, MO (2009, Session FrA18)
23. IEEE International Conference on Robotics and Automation, Kobe, Japan (2009, Session FrC11)
24. 16th SPIE Annual International Symposium on Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring: Electroactive Polymer Actuators and Devices (EAPAD XI), San Diego, CA (2009, Session 8)
25. American Control Conference, Seattle, WA (2008, Session WeC03)
26. International Symposium on Applied Electromagnetics and Mechanics, East Lansing, MI (2007, Session M-PM-2)
27. American Control Conference, New York, NY (2007, Session FrA03)
28. World Forum on Smart Materials and Smart Structures Technology, Chongqing & Nanjing, China (2007, Session S27)
29. IEEE/RSJ International Conference on Intelligent Robots and Systems, Beijing, China (2006, Session FP1-13)
30. Nanomedicine Conference, East Lansing, MI (2006, Hot Topic Session in Symposium II)
31. American Control Conference, Portland, OR (2005, Session FrA03)
32. American Control Conference, Denver, CO (2003, Session FM11)
33. Third SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA (2000, Session CP11)

Reviewer for Funding Agencies

1. Panelist, NSF, 2004; 2006 (twice); 2008; 2009 (four times); 2010 (twice); 2011 (twice); 2012 (twice); 2013 (twice); 2014 (twice); 2015 (four times); 2018; 2019; 2020 (twice); 2021 (three times); 2022 (twice); 2023 (three times); 2024 (five times)
2. Reviewer, Toyota Programmable System Innovation Fellowship Program, 2022
3. Reviewer, Hong Kong RGC, 2016
4. Reviewer, Deutsche Forschungsgemeinschaft (DFG), Germany, 2015
5. Reviewer, King Abdullah University of Science and Technology (KAUST), Kingdom of Saudi Arabia, 2015
6. Ad hoc reviewer, NSF, 2005, 2011, 2014, 2017
7. Reviewer, NASA, 2010, 2011
8. Reviewer, Army Research Office, 2010

Reviewer for Archival Journals

1. ASME Journal of Dynamic Systems, Measurement and Control
2. Automatica
3. Bioinspiration and Biomimetics
4. Chaos: An Interdisciplinary Journal of Nonlinear Science
5. Continuum Mechanics and Thermodynamics
6. Discrete and Continuous Dynamical Systems
7. European Journal of Control
8. IEEE Control Systems Letters
9. IEEE Control Systems Magazine
10. IEEE/ASME Journal of Microelectromechanical Systems
11. IEEE Robotics and Automation Letters
12. IEEE Robotics and Automation Magazine
13. IEEE Signal Processing Letters
14. IEEE Transactions on Automatic Control
15. IEEE Transactions on Automation Science and Engineering
16. IEEE Transactions on Control Systems Technology
17. IEEE Transactions on Industrial Electronics
18. IEEE Transactions on Industrial Informatics
19. IEEE Transactions on Magnetics
20. IEEE/ASME Transactions on Mechatronics
21. IEEE Transactions on Neural Networks
22. IEEE Transactions on Robotics
23. IEEE Transactions on Systems, Man, and Cybernetics: Systems
24. IEEE Transactions on Systems, Man, and Cybernetics C
25. International Journal for Numerical Analysis and Modeling
26. International Journal on Mechatronics
27. International Journal of Advanced Robotic Systems
28. International Journal of Control
29. International Journal of Modelling and Simulation

30. International Journal of Smart and Nano Materials
31. Journal of Applied Physics
32. Journal of Bionic Engineering
33. Journal of Computational and Applied Mathematics
34. Journal of Fluids and Structures
35. Journal of Intelligent Material Systems and Structures
36. Journal of Magnetism and Magnetic Materials
37. Journal of Mechanisms and Robotics
38. Journal of Nanoscience and Nanotechnology
39. Journal of Nonlinear Science
40. Journal of Vacuum Science and Technology A
41. Journal of Zhejiang University Science A
42. Materials Science and Engineering: C
43. Mathematical Modeling of Natural Phenomena
44. Optimal Control, Applications and Methods
45. Physica B
46. Polymer International
47. Proceedings of the Royal Society A
48. Scientific Reports
49. Sensors and Actuators A: Physical
50. SIAM Journal on Applied Mathematics
51. SIAM Journal on Control and Optimization
52. Smart Materials and Structures
53. Soft Robotics
54. Systems and Control Letters

Reviewer for Publishers

1. Elsevier, 2014, 2015, 2016, 2017
2. Princeton University Press, 2010
3. Pan Stanford Publishing, Singapore, 2008
4. McGraw-Hill Companies, 2007
5. Springer, 2006

Reviewer for Conferences

1. ACM International Conference on Underwater Networks and Systems (WUWNet 2012)
2. American Control Conference (ACC 2004, 2005, 2007 - 2012, 2014, 2017, 2020, 2025)
3. ASME Dynamic Systems and Control Conference (DSCC 2009, 2010, 2015, 2017, 2020)
4. European Control Conference (ECC 2007, 2009)
5. IEEE Conference on Control Applications (CCA 2004, 2006)
6. IEEE Conference on Decision and Control (CDC 2004 - 2007, 2011, 2016, 2017, 2022)
7. IEEE Conference on Robotics and Automation (ICRA 2008, 2011-2014, 2017, 2021, 2025)
8. IEEE International Conference on Electro/Information Technology (EIT 2006)
9. IEEE International Conference on Networks (ICON 2004)

10. IEEE International Conference on Robotics and Biomimetics (ROBIO 2008)
11. IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2005, 2007, 2011, 2012, 2017, 2021, 2022, 2024)
12. IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA 2008)
13. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2006, 2008, 2010, 2011, 2012, 2014)
14. IFAC Symposium on Mechatronic Systems (2010)
15. IFAC Workshop on Fractional Derivatives and Applications (FDA 2010, 2013)
16. IFAC World Congress (2005, 2008, 2011, 2014, 2017, 2020)
17. The 1st International Conference on Applied Bionics and Biomechanics (ICABB 2010)
18. International Conference on Intelligent Robots and Applications (ICIRA 2012)
19. Joint International Symposium on Intelligent Control & 13th Mediterranean Conference on Control and Automation (ISIC-MED 2005)
20. The 8th World Congress on Intelligent Control and Automation (WCICA 2010)

INSTITUTIONAL AND COMMUNITY SERVICES

University Committees

1. MSU Office of Research Regulatory Support (ORRS) Faculty Advisory Committee, April 2024 - present
2. MSU Water Structure Advisory Committee, January 2021 - April 2022
3. MSU Water Science Curriculum Committee, 2018 - 2019
4. MSU Water Science Network Advisory Committee, July 2016 - May 2019
5. All-University Awards Committee, Fall 2010
6. University Jurisdictional Appeals Panel, 2010
7. University Appeals Board, March 2007 - February 2009

Departmental Services

1. Associate Chair for Research, Fall 2022 - present
2. Chair, Robotics and Control Area, Fall 2019 - present
3. Promotion and Tenure Committee, Summer 2016 - Spring 2022
4. Member, Dennis P. Nyquist Endowed Professorship in Electromagnetics Search Committee, May - June 2020
5. Chair, Dennis P. Nyquist Endowed Professorship in Electromagnetics Search Committee, June 2017
6. Chair, Faculty Search Committee (robotics and controls), October 2015 - May 2016
7. Chair, Department Chair Search Committee, October 2014 - July 2015
8. Advisory Committee of ECE Department (Chair: 2011 - 2012, 2015 - 2016; Member: 2008 - 2010, 2012 - 2013, 2016 - 2017)
9. Graduate Studies Committee (Chair: 2017 - 2022; Member: 2005 - 2006)
10. Graduate Admissions Recruiting & Financial Aids Committee (GARFAC) (Chair: 2010 - 2012; Member: 2005 - 2006, 2009 - 2010, 2015 - 2017)
11. ECE Department Research Task Force, 2010 - 2015, 2019 - 2023
12. Graduate Recruitment Coordinator, 2012 - 2014
13. Awards Committee, 2010 - 2011

14. ECE Seminar Series Coordinator, 2006 - 2008

Ad-hoc Committees and Services

1. Faculty Search Committee, Technology Engineering Program, College of Engineering, Michigan State University, October 2023 - present
2. Search Committee for Associate Dean for Inclusion and Diversity, College of Engineering, Michigan State University, March 2022 - June 2022
3. Faculty Search Committee, Department of Computer Science and Engineering, Michigan State University, June 2018 - May 2019
4. Research Integrity Investigative Committee, Michigan State University, December 2016 - May 2017
5. Search Committee for Director for the Engineering Residential Experience and Cornerstone Engineering Program, College of Engineering, Michigan State University, 2011
6. Search Committee for BEACON Center Education Director, Michigan State University, 2010
7. Connector Faculty for engineering freshmen, 2009 - 2011
8. The ECE Department Strategic Planning Committee, 2009
9. College of Engineering Web Design Committee, 2007
10. Search Committee for Recruitment and Retention Coordinator, Diversity Programs Office, College of Engineering, Michigan State University, 2005 - 2006
11. Faculty Advisor, Undergraduate Research Program, Diversity Programs Office, Michigan State University, 2005

Student Group Advising

1. Faculty Advisor, FIRST at Michigan State, 2018 - present
2. Faculty Advisor, MSU STrength Augmenting Robotic eXoskeleton (STARX) Team, 2018 - present
3. Faculty Advisor, IEEE RAS Student Branch Chapter at MSU, 2018 - 2019

Outreach and Community Service

1. Curator, exhibit "Robofish rendezvous", MSU Museum, April 2016 - January 2017
2. Presenter and panelist, Next Generation STEM Learning for All: A Forum Supported by NSF, Washington, DC, November 9, 2015
3. Director, NSF-funded Research Experiences for Teachers (RET) Site on Robotics Engineering for Better Life and Sustainable Future, MSU, 2013 - 2016
4. Director, NSF-funded Research Experiences for Teachers (RET) Site on Bio-Inspired Technology and Systems (BITS), MSU, 2009 - 2012
5. Represented NSF (with 15 other teams) at the second US Science and Engineering Festival Expo and presented exhibit "Robotic Fish Patrolling Waters", April 27-29, 2012
6. Represented NSF (with 14 other teams) at the first US Science and Engineering Festival Expo and presented exhibit "Swimming with Robotic Fish", October 23-24, 2010
7. Held a 5-hour Frontiers in Sciences workshop for the graduate program for science teachers, offered by the MSU College of Natural Resources, Division of Science and Mathematics Education, March 26, 2011
8. Representing MSU in advocating for national science funding at the 14th Annual Coalition for National Science Funding (CNSF) Exhibition and Reception, Capitol Hill, June 25, 2008
9. Conducting interactive lectures and lab tours for prospective students and various outreach programs, such as MSU Science Festival, Detroit-Area Pre-College Engineering Program (DAPCEP), WIMS for Teens Program, Women in Engineering Program, Grandparents University Program, High School Engineering Institute, BEACON High School Program, and Engineering Preview Day, 2005 - present

10. Engineering faculty representative, Career Day at Chippewa Middle School Okemos, MI, 2006, 2007

INDUSTRY ENGAGEMENT

1. Member of Board of Advisors, Motmot Inc., 2024 - present
2. Consulting, Lear Corporation, 2005