YU MEI

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428 S. Shaw Lane, 2120 Engineering Building, Michigan State University, East Lansing, USA. 48823

EDUCATION

Michigan State University (MSU), East Lansing, USA — *Aug. 2021 – Present*
Ph.D. Candidate, Department of Electrical and Computer Engineering
GPA: 4.0/4.0

Southeast University (SEU), Nanjing, China — *Sep. 2016 – Jun. 2020*
B.E. in Robot Engineering, Department of Automation
GPA: 3.8/4.0

HONORS AND AWARDS

1. 2025 DSCD Best Mechatronics Paper Award — *May 2026*
2. 2025 ASME DSCD Rising Star — *Oct. 2025*
3. Best Student Paper, 2024 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2024) — *Jul. 2024*
4. Best Student Paper Finalist, Modeling, Estimation and Control Conference (MECC) — *Oct. 2025*
5. Engineering Distinguished Scholar, MSU — *Aug. 2021*
6. Outstanding Graduate of SEU (Top 3%) — *Jun. 2020*
7. Student Travel Award, MECC 2025, AIM 2024, ACC 2023
8. Meritorious Winner (Top 5%), Interdisciplinary Contest in Modeling (ICM) — *Apr. 2019*
9. BOSCH Scholarship (4 receivers annually in SEU) — *Jun. 2020*
10. Merit Student of SEU (Top 10%) — *2017, 2018, 2019*
11. 1st Prize (Top 1%), National Computer Projects Designing Contest in Jiangsu PR — *May 2017*

PUBLICATIONS

Journal

[J11] **Y. Mei**, X. Zhou, V. Naik, A. Gao, and X. Tan, "BiPneu: Design and Control of a Bipolar-Pressure Pneumatic System for Soft Robots," *IEEE/ASME Transactions on Mechatronics*, early access, 2026. (Paper) (Video)

[J10] **Y. Mei**, L. Peng, H. Shi, X. Qi, Y. Deng, V. Srivastava, and X. Tan, "Simultaneous Shape Reconstruction and Force Estimation of Soft Bending Actuators Using Distributed Inductive Curvature Sensors," *IEEE/ASME Transactions on Mechatronics*, vol. 29, no. 4, pp. 2849–2857, 2024. Paper was presented at *AIM 2024*. **2025 ASME DSCD Best Joint Journal/Conference Paper Award on Mechatronics** & **Best Student Paper Award** at *AIM 2024*. (Paper) (Video)

[J9] X. Qi, **Y. Mei**, D. Chen, Z. Li, and X. Tan, "Design and Nonlinear Modeling of a Modular Cable-Driven Soft Robotic Arm," *IEEE/ASME Transactions on Mechatronics*, vol. 29, no. 4, pp. 3083–3091, 2024. Paper was presented at *AIM 2024*. (Video)

[J8] X. Zhou, **Y. Mei**, F. Thomson, C. Luedtke, X. Qi, and X. Tan, "Dynamic Modeling and Robust Gait Optimization of a Compliant Worm Robot," accepted, *ASME Journal of Dynamic Systems, Measurement, and Control*, 2026.

[J7] H. Wang, K. Zhang, K. Lee, **Y. Mei**, V. Srivastava, J. Sheng, Z. Song, and Z. Li, "Velocity-Form Data-Enabled Predictive Control of Soft Robots Under Unknown External Payloads," *IEEE Robotics and Automation Letters*, vol. 11, no. 8, pp. 9151–9158, 2026.

[J6] S. Yuan, P. Fairchild, **Y. Mei**, X. Zhou, and X. Tan, "AFT: Appearance-Based Feature Tracking for Markerless and Training-Free Shape Reconstruction of Soft Robots," *IEEE Robotics and Automation Letters*, vol. 11, no. 2, pp. 1106–1113, 2026. (Video)

[J5] N. Shin, **Y. Mei**, X. Tan, V. Srivastava, and R. Ranganathan, "Error Compensation in a Redundant System During 'Failure' of Individual Motor Elements," *Experimental Brain Research*, vol. 243, no. 2, Art. no. 46, 2025.

[J4] H. Wang, K. Zhang, K. Lee, **Y. Mei**, K. Zhu, V. Srivastava, J. Sheng, and Z. Li, "Mechanical Design and Data-Enabled Predictive Control of a Planar Soft Robot," *IEEE Robotics and Automation Letters*, vol. 9, no. 9, pp. 7923–7930, 2024. (Video)

[J3] P. Fairchild, **Y. Mei**, and X. Tan, "Physics-Informed Online Estimation of Stiffness and Shape of Soft Robotic Manipulators," *IEEE Control Systems Letters*, vol. 7, pp. 3585–3590, 2023. Paper was presented at the *American Control Conference (ACC)*, Toronto, Canada, 2024.

[J2] P. Fairchild, N. Shepard, **Y. Mei**, and X. Tan, "Semi-Physical Modeling of Soft Pneumatic Actuators With Stiffness Tuning," *ASME Letters in Dynamic Systems and Control*, vol. 3, no. 4, Art. no. 041006, 2023. Paper was presented at the *Modeling, Estimation and Control Conference (MECC)*, Lake Tahoe, NV, USA, 2023.

[J1] H. Shi, **Y. Mei**, I. Gonzalez-Afanador, C. Chen, S. Miehls, C. Holbrook, N. Sepulveda, and X. Tan, "Automated Soft Pressure Sensor Array-Based Sea Lamprey Detection Using Machine Learning," *IEEE Sensors Journal*, vol. 23, no. 7, pp. 7546–7557, 2023.

Conference

[C3] **Y. Mei**, S. Yuan, X. Qi, P. Fairchild, and X. Tan, "Learning-Based Modeling of Soft Actuators Using Euler Spiral-Inspired Curvature," *The 5th Modeling, Estimation and Control Conference (MECC)*, Pittsburgh, PA, USA, 2025. Recognized as a **Best Student Paper Finalist**. (Paper)

[C2] **Y. Mei**, X. Zhou, S. Yu, V. Srivastava, and X. Tan, "Fast Online Adaptive Neural MPC via Meta-Learning," *The 5th Modeling, Estimation and Control Conference (MECC)*, Pittsburgh, PA, USA, 2025. (Paper) (Video)

[C1] **Y. Mei**, P. Fairchild, V. Srivastava, C. Cao, and X. Tan, "Simultaneous Motion and Stiffness Control for Soft Pneumatic Manipulators Based on a Lagrangian-Based Dynamic Model," *Proceedings of the 2023 American Control Conference (ACC)*, San Diego, CA, USA, pp. 145–152, 2023. (Paper) (Video)

Preprint

[P1] **Y. Mei**, X. Zhou, and X. Tan, "Modeling and Mixed-Integer Nonlinear MPC of Positive-Negative Pressure Pneumatic Systems," *arXiv:2510.00433*, 2025. (Paper)

INVENTIONS

[I1] 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.

RESEARCH EXPERIENCE

Smart Microsystem Lab, MSU *Aug. 2021 – Present*

Graduate Research Assistant

1. *SMART: Soft Multi-Arm RoboT for Synergistic Collaboration with Humans*
   Sponsor: NSF National Robotics Initiative
   - Topic: Modeling and control of soft robots, including manipulators and fingers (Poster, Video).
   - Tools: Matlab.

2. *Reshape Motor Learning in High-Dimensional Tasks via Soft Robotic Physical Interactions*
   Sponsor: NSF Mind, Machine, and Motor
   - Topic: Building communication and user interfaces for collecting hand pose data from a commercial robotic glove for motor learning (Video).
   - Tools: C++, Matlab.

3. *Automated Soft Pressure Sensor Array-Based Sea Lamprey Detection Using Machine Learning*
   Sponsor: Great Lakes Fishery Commission
   - Topic: Using machine learning to enable soft pressure sensor panel to automatically detect the suction of a sea lamprey (Video).
   - Tools: Python.
4. *High-throughput Infrastructure-enabled Automated Valet Parking System*
   Sponsor: Ford Motor Company
   - Topic: Evaluating the automated valet parking algorithm via both simulation studies and experiments on scaled model cars.
   - Tools: Python.

Learning Machine Research Center, SEU *Nov. 2020 – Apr. 2021*
Full-time Research Assistant

· Topic: Reinforcement Learning
· Tools: Python

The Institute of Robot Sensor and Control Technology, SEU *Nov. 2019 – Jun. 2020*
Undergraduate Research Assistant, Graduation Project

· Topic: Medical Rehabilitation Robots (Video1, Video2)
· Designed a desktop rehabilitation robot system, including mechanical design, 3D printing, kinematics and dynamics modeling and simulation, virtual environment design, and human experiments.
· Tools: C, ESCON, Solidworks, CHAI3D

WORK EXPERIENCE

Tsinghua University Suzhou Automotive Research Institute *Jul. 2020 – Sep. 2020*
PLUSGO Co., Summer Intern

· Topic: Self-driving Vehicles (Video1, Video2)
· Developed driverless perception algorithms in embedded systems.
· Used machine learning methods to detect real-time trunks on the road and lanes.
· Used Python and PyQt to analyze data and develop user interfaces.
· Tools: C++, Python, PyQt, PyTorch, Nvidia Jetson

BOZHON Precision Industry *Aug. 2019*
Summer Intern

· Topic: 5G Intelligent Mobile Robot (Video)
· Improved the TEB (Timed Elastic Band) local path planning algorithm, optimized the performance, and reduced algorithm complexity.
· Combined A* global path planning and TEB local path planning.

TALKS AND PRESENTATIONS

1. Oral Presentation, IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Genova, Italy, Jul. 2026.
2. Oral Presentation, The 5th Modeling, Estimation and Control Conference (MECC 2025), Pittsburgh, PA, USA, Oct. 2025.
3. Oral Presentation, IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Boston, MA, USA, Jul. 2024.
4. "Designing Control Algorithms to Improve Human-Robot Collaboration and Rehabilitation," Oral Presentation, Admitted Student Day, MSU, East Lansing, MI, USA, Apr. 2024.

5. "Design, Fabrication, Modeling and Control of Soft Robotics," Invited Talk, School of Automation, Southeast University, Nanjing, China, virtual, Sep. 2023.
6. Oral Presentation, American Control Conference, San Diego, CA, USA, May 2023.
7. Graduate Research Symposium, MSU, 2023–2024.
8. "Soft Pneumatic Manipulator with Stiffness Tuning Capability," Poster Presentation, *Octopus Inspired Biodesign Symposium* by NIH BRAIN Initiative and MSU, 2022.

PROFESSIONAL SERVICE AND MEMBERSHIP

Invited Reviewer

1. IEEE/ASME Transactions on Mechatronics (TMech) *2025–Present*
2. IEEE Robotics and Automation Letters (RAL) *2026–Present*
3. IEEE Transactions on Automation Science and Engineering (TASE) *2026–Present*
4. Robotics and Autonomous Systems (RAS) *2025–Present*
5. Nonlinear Dynamics *2025–Present*
6. IEEE Sensors Journal *2025–Present*
7. Scientific Reports *2025–Present*
8. ASME Journal of Dynamic Systems, Measurement, and Control (JDSMC) *2025–Present*
9. ASME Letters in Dynamic Systems and Control (ALDSC) *2026–Present*
10. Journal of Intelligent and Robotic Systems *2026–Present*
11. Frontiers in Robotics and AI *2024–Present*
12. International Journal of Intelligent Transportation Systems Research *2025–Present*
13. IEEE International Conference on Automation Science and Engineering (CASE) *2026–Present*
14. IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM) *2025–Present*
15. IEEE International Conference on Rehabilitation Robotics (ICORR) *2025–Present*
16. Modeling, Estimation, and Control Conference (MECC) *2024–Present*
17. IEEE-RAS International Conference on Soft Robotics (RoboSoft) *2024–Present*
18. American Control Conference (ACC) *2023–Present*

Committee Services

1. Senior Reviewer, IEEE RAS Young Reviewers Program *2026*
2. Student Representative, Engineering Graduate Studies Committee, MSU *2024–2025*
3. Vice Chair, IEEE MSU Student Branch *2023–2024*
4. Organizing Committee Member, IEEE Southeastern Michigan Fall 2023 Conference *2023*

Professional Membership

1. Graduate Student Member, IEEE *2021–Present*
2. Student Member, ASME *2024–Present*
3. Member, IEEE Young Professionals *2022–Present*
4. Member, IEEE Robotics and Automation Society *2023–Present*

STUDENT MENTORING

Undergraduates

1. Vedant Naik, Department of Electrical and Computer Engineering, MSU. September 2023 – Present. Topic: Soft robotics.
2. Janna Salera, Department of Electrical and Computer Engineering, MSU. April 2024 – December 2024. Topic: Soft robotic glove.
3. Vu Phi, Department of Computer Science and Engineering, MSU. September 2022 – February 2023. Topic: Soft robotic glove.
4. Matthew Russell, Department of Mechanical Engineering, MSU. September 2021 – December 2022. Topic: Soft robotic glove.

High School Students

1. Alan Gao, The Harker School. August 2025. Topic: Soft robotics. Later at: UCLA.
2. Matthew Gomez, High School Honors Science, Math and Engineering Program. July 2024. Topic: Soft robotics. Later at: UC Berkeley.
3. Daniel Cui, Okemos High School. June 2024 – August 2024. Topic: Soft sensors and soft robotics. Later at: University of Michigan.
4. Alex Zhang, Okemos High School. June 2023 – September 2023. Topic: Soft sensors. Later at: Columbia University.

OUTREACH AND COMMUNITY SERVICE

1. Volunteer, Workshop on Nonlinear Systems and Control at MSU, 2023.
2. Volunteer, ACC 2023.
3. Volunteer, Spartan Future Engineer Preview Day, 2021–2022.
4. Volunteer, Robotics and Control Seminar in MSU, 2022–2024.

TECHNICAL SKILLS

Programming Languages	Python, C/C++, MATLAB
Learning & Optimization Libraries	PyTorch, CasADi, Acados, Keras
Robotics Tools & Simulations	ROS2, Isaac Sim, PyBullet, MuJoCo, Webots, SOFA
Embedded Systems	Nvidia Jetson, Raspberry Pi, Arduino
Design & Analysis	Solidworks, Simulink, Abaqus