YU MEI

meiyu1@msu.edu (+1)517-303-2652 *Linkedin*
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 ASME Dynamic Systems & Control Division (DSCD) Rising Star — *Oct. 2025*
2. Best Student Paper Finalist, Modeling, Estimation and Control Conference (MECC 2025) — *Oct. 2025*
3. Best Student Paper, 2024 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2024) — *July. 2024*
4. Student Travel Award, MECC 2025, AIM 2024, ACC 2023
5. Engineering Distinguished Scholar, MSU — *Aug. 2021*
6. Outstanding Graduate of SEU (Top 3%) — *Jun. 2020*
7. Meritorious Winner (Top 5%), Interdisciplinary Contest in Modeling (ICM) — *Apr. 2019*
8. BOSCH Scholarship (4 receivers annually in SEU) — *Jun. 2020*
9. Merit Student of SEU (Top 10%) — *2017, 2018, 2019*
10. 1st Prize (Top 1%), National Computer Projects Designing Contest in Jiangsu PR — *May 2017*

PUBLICATIONS

[P13] **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*, 2024. **Best Student Paper Award** at *AIM 2024*. (Video)

[P12] **Y. Mei**, X. Zhou, V. Naik, A. Gao and X. Tan, "BiPneu: Design and Control of a Bipolar-Pressure Pneumatic System for Soft Robots," under review, *IEEE/ASME Transactions on Mechatronics*, 2025.

[P11] **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)

[P10] **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)

[P9] **Y. Mei**, X. Zhou, and X. Tan, "Modeling and Mixed-Integer Nonlinear MPC of Positive-Negative Pressure Pneumatic Systems," *Submitted to ACC 2026*. (Paper)

[P8] **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, pp. 145-152, 2023.

[P7] 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, 2025.

[P6] 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, p. 46, 2025.

[P5] H. Wang, K. Zhang, K. Lee, **Y. Mei**, K. Zhu, V. Srivastava and Z. Li, "Mechanical design and data-enabled predictive control of a planar soft robot," *IEEE Robotics and Automation Letters*, 2024. (Video)

[P4] 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*, 2024. Paper was presented at the *AIM 2024*. (Video)

[P3] P. Fairchild, **Y. Mei**, and X. Tan, "Physics-Informed Online Estimation of Stiffness and Shape of Soft Robotic Manipulators," *IEEE Control Systems Letters*, 2023. Paper was presented at the *Amercian Control Conference (ACC)*, Toronto, Canada, 2024.

[P2] 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*, 2023. Paper presented at the *Modeling, Estimation and Control Conference (MECC)*, Lake Tahoe, NV, USA, 2023.

[P1] 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.

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 - April. 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, human experiments.
· Tools: C, ESCON, Solidworks, CHAI3D

WORK EXPERIENCE

Tsinghua University Suzhou Automative Research Institute *July 2020 - Step. 2020*
PLUSGO Co., Summer Intern

· Topic: Self-driving Vehicles (Video1, Video2)
· Developing driveless perception algorithms in embedded system
· Using machine learning methods to detect real-time trunk on the road and lane
· Using Python and Pyqt to analyze data and develop user interface
· Tools: C++, Python, Pyqt, Pytorch, Nvidia Jetson

BOZHON Precision Industry *Aug. 2019*
Summer Intern

· Topic: 5G Intelligent Mobile Robot (Video)
· Improving TEB(Timed Elastic Band) local path planning algorithm, optimizing the performance and reducing algorithm complexity.
· Combining A* global path planning and TEB local path planning

TALKS AND PRESENTATIONS

1. Oral Presentation, The 5th Modeling, Estimation and Control Conference (MECC 2025), Pittsburgh, PA, USA, 2025 October.
2. Oral Presentation, IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Boston, MA, USA, 2024 July.
3. "Designing Control Algorithms to Improve Human-robot Collaboration and Rehabilitation", Oral Presentation, Admitted Student Day, MSU, East Lansing, MI, USA, 2024 April.
4. "Design, Fabrication, Modelling and Control of Soft Robotics," Invited talk, School of Automation, Southeast University, Nanjing, China, (virtual), 2023 September.
5. Oral Presentation, American Control Conference, San Diego, CA, USA, 2023 May.
6. Graduate Research Symposium, MSU, 2023-2024.
7. "Soft Pneumatic Manipulator with Stiffness Tuning Capability," poster presentation at *Octopus Inspired Biodesign Symposium* by NIH BRAIN Initiative and MSU, 2022.

PROFESSIONAL SERVICE AND MEMBERSHIP

Invited Reviewer

1. IEEE/ASME Transactions on Mechatronics *2025*
2. Robotics and Autonomous Systems *2025*
3. Nonlinear Dynamics *2025*
4. IEEE Sensor Journal *2025*
5. Scientific Reports *2025*
6. ASME Journal of Dynamic Systems Measurement and Control *2025*

7. Frontiers of Robots and AI *2024*
8. International Journal of Intelligent Transportation Systems Research *2025*
9. IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM) *2025*
10. IEEE International Conference on Rehabilitation Robotics (ICORR) *2025*
11. Modeling, Estimation, and Control Conference (MECC) *2024, 2025*
12. IEEE-RAS International Conference on Soft Robotics (RoboSoft) *2024*
13. American Control Conference (ACC) *2023*

Student Services

1. Student Representative, Engineering Graduate Studies Committee, MSU *2024 - 2025*
2. Vice Chair, IEEE MSU Student Branch *2023 - 2024*

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*

STEUDENT MENTORING

Undergraduates

1. Vedant Naik, Department of Electrical and Computer Engineering, MSU. September 2023 - Present. Topic: Soft robotics.
2. Vu Phi, Department of Computer Science and Engineering, MSU. September 2022 - February 2023. Topic: Soft robotic glove.
3. 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. Topics: Soft robotics.
2. Matthew Gomez, High School Honors Science, Math and Engineering Program. July 2024. Topic: Soft robotics.
3. Daniel Cui, Okemos High School. June 2024 - August 2024. Topic: Soft sensors. Topic: Soft Robotics.
4. Daniel Cui, Okemos High School. June 2024 - august 2024. Topic: Soft robotics.
5. Alex Zhang, Okemos High School. June 2023 - September 2023. Topic: Soft sensors.

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	MATLAB, C/C++, Python
Software & Tools	Solidworks, Qt
Platform	Linux