

SHANGYUAN YUAN

517-528-3909 ◇ East Lansing, MI, USA ◇ yuanshan@msu.edu

PROFILE

I am currently a Ph.D. student with a strong passion for artificial intelligence and robotics. During my undergraduate studies, I focused on control theory, gaining a solid foundation in system modeling and control theories. In my master's program, I delved into the world of artificial intelligence, exploring advanced algorithms and machine learning techniques. Now, as a doctoral researcher, my goal is to integrate these two disciplines, enabling robots to achieve greater practical utility and contribute to solving real-world challenges.

EDUCATIONS

Michigan State University

Ph.D in Electrical and Computer Engineering | GPA: 4.0/4.0

Aug 2024 - Present

Advisor: Prof. Xiaobo Tan

Tsinghua University

Master of Engineering in Artificial Intelligence | GPA: 3.76/4.0

Sep 2021 - Jun 2024

Advisor: Prof. Xiangyang Ji

Tsinghua University

Bachelor of Engineering in Automation | GPA: 3.54/4.0

Sep 2017 - Jun 2021

PUBLICATIONS

Yuan, S., Fairchild, P., Mei, Y., Zhou, X., & Tan, X. (2025). AFT: Appearance-Based Feature Tracking for Markerless and Training-Free Shape Reconstruction of Soft Robots. *IEEE Robotics and Automation Letters (RA-L)*.

Mei, Y., **Yuan, S.**, Qi, X., Fairchild, P., & Tan, X. (2025). Learning-Based Modeling of Soft Actuators Using Euler Spiral-Inspired Curvature. *ASME Modeling, Estimation and Control Conference (MECC)*.

Zou, Q.*, **Yuan, S.***, Du, S., Wang, Y., Liu, C., Xu, Y., Chen, J., & Ji, X. (2024). ParCo: Part-Coordinating Text-to-Motion Synthesis. *European Conference on Computer Vision (ECCV)*. (*Equal contribution)

Kung, M., Zeng, J., Lin, S., Yu, X., Liu, C., Shi, M., Sun, R., **Yuan, S.**, Lian, X., Su, X., Zhao, Y., Zheng, Z., & Ji, X. (2024). Prediction of Coronary Artery Disease Based on Facial Temperature Information Captured by Non-contact Infrared Thermography. *BMJ Open*.

PROJECTS

World Models for Atari Games

2025 – Present

Michigan State University

- Training a world model from scratch to learn Atari game dynamics and enable reinforcement learning through imagination.
- Proposed a reference-conditioned observation generation mechanism to reduce pixel-level memorization and improve dynamics learning.
- Work in progress; a paper based on this project is currently in preparation.

Learning Intuitive Teleoperation for Heterogeneous Leader–Follower Robot Systems

2025 – Present

Michigan State University | Advisor: Prof. Xiaobo Tan

- Implemented a teleoperation system where a rigid robotic arm controls a soft continuum robot.
- Proposed a self-supervised learning method to automatically align the action spaces between the leader and follower robots.
- Validated in simulation; real-world experiments with the physical robot are currently in progress.

Soft Robot Shape Modeling and Vision-Based Shape Estimation

2024 – 2025

Michigan State University | Advisor: Prof. Xiaobo Tan

- Developed learning-based and physics-inspired models for shape representation of continuum soft robots.
- Proposed a markerless, vision-based framework for real-time 3D shape reconstruction using RGB-D sensing, leveraging natural surface features as implicit visual markers.
- Designed a hierarchical feature matching and kinematic optimization pipeline for robust shape tracking under occlusions and varying viewpoints.
- Publications: *RA-L'25*, first author; *MECC'25*, co-author.

ParCo: Part-Coordinating Text-to-Motion Generation

2023 – 2024

Tsinghua University | Advisor: Prof. Xiangyang Ji

- Proposed a part-coordinated framework for text-to-motion generation to model interactions between articulated body parts.
- Published at *ECCV'24*, co-first author.

Facial Representation-Based Coronary Artery Disease (CAD) Diagnosis

2021 – 2024

Tsinghua University | Advisor: Prof. Xiangyang Ji

- Built a multi-camera acquisition array for large-scale facial data collection for medical analysis.
- Implemented multi-view 3D face reconstruction to recover for physiological feature modeling.
- Applied transfer learning with parameter-efficient fine-tuning (PEFT) to adapt to medical datasets.
- Developed a multimodal learning framework integrating facial imagery and clinical metadata for CAD prediction.

RESEARCH SKILLS

Machine Learning: Contrastive Learning, World Models for Reinforcement Learning, Transfer Learning (Parameter-Efficient Fine-Tuning)

Generative Models: Diffusion Models, Variational Autoencoders, Action Generation, Image Generation

Robotics: Teleoperation, Imitation Learning, Simulation (PyBullet)

Programming: Proficient in C++, C#, and Python for upper-level software and deep-learning algorithm development. Experienced in STM32 microcontroller and analog-digital circuit system development.