Sha Yi

She/Her

✉ shayi@ucsd.edu | 🏠 yswhynot.github.io | ⬤ yswhynot | 🎓 google scholar

Research Interests

Using machine learning to design, control, and simulate novel robotic systems. Data-driven approaches that jointly optimize hardware, fabrication processes, and control policies to embed intelligence in physical structures.

Current Employment

Postdoc Scholar   *Sep 2024 - now*
UC SAN DIEGO
Work with Xiaolong Wang & Mike Tolley on machine learning for robot design.

Education

Carnegie Mellon University   *2024*
PHD IN ROBOTICS
Advisor: Katia Sycara, Zeynep Temel

Carnegie Mellon University   *2019*
MS IN ROBOTICS
Advisor: Katia Sycara

The Hong Kong Polytechnic University   *2017*
BENG IN ELECTRONIC AND INFORMATION ENGINEERING

Publications

Data-driven Modeling and Feedforward Control of Millimeter-Scale Vine Robots

Sukjun Kim, **Sha Yi**, Xiaolong Wang, Michael T. Tolley, Tania K. Morimoto
under review, 2025

Cross-Embodied Co-Design for Dexterous Hands

Kehlani Fay, Darin Anthony Djapri, Anya Zorin, James Clinton, Ali El Lahib, **Sha Yi**, Michael T. Tolley, Hao Su, Xiaolong Wang
under review, 2025

Learning to Design Soft Hands using Reward Models

Xueqian Bai, Nicklas Hansen, Adabhav Singh, Michael T. Tolley, Yan Duan, Pieter Abbeel, Xiaolong Wang, **Sha Yi**
under review, 2025

Co-Design of Soft Gripper with Neural Physics

Sha Yi*, Xueqian Bai*, Adabhav Singh, Jianglong Ye, Michael T Tolley, Xiaolong Wang
Conference on Robot Learning (CoRL), 2025

Stiffening, Shaping, and Locomotion of Reconfigurable Robot Swarm Through Simple 1-DOF Arm Mechanisms

James Clinton, **Sha Yi**, Elliot Hawkes, Zeynep Temel
under review, 2025

Humanoid Policy ~ Human Policy

Ri-Zhao Qiu, Shiqi Yang, Xuxin Cheng, Chaitanya Chawla, Jialong Li, Tairan He, Ge Yan, David J Yoon, Ryan Hoque, Lars Paulsen, Ge Yang, Jian Zhang, **Sha Yi**, Guanya Shi, Xiaolong Wang
Conference on Robot Learning (CoRL), 2025

Reconfigurable Robot Swarms for Terrain Traversal with Passive Coupling Mechanisms

Sha Yi, Shashwat Singh, Allison Seo, Ryan St. Pierre, Katia Sycara, Zeynep Temel
Autonomous Robots, 49(3), 1-18, 2025

Hardware Optimization for In-Hand Rotation

Kehlani Fay, **Sha Yi**, Michael T Tolley, Xiaolong Wang, Hao Su
Workshop on Robot Hardware-Aware Intelligence (RSS), 2025

Mobile-TeleVision: Predictive Motion Priors for Humanoid Whole-Body Control

Chenhao Lu*, Xuxin Cheng*, Jialong Li*, Shiqi Yang, Mazeyu Ji, Chengjing Yuan, Ge Yang, **Sha Yi**, Xiaolong Wang
International Conference on Robotics and Automation (ICRA), 2025

ACE: A Cross-platform Visual-Exoskeletons for Low-Cost Dexterous Teleoperation

Shiqi Yang, Minghuan Liu, Yuzhe Qin, Runyu Ding, Jialong Li, Xuxin Cheng, Ruihan Yang, **Sha Yi**, Xiaolong Wang
Conference on Robot Learning (CoRL), 2024

Decentralized Multi-Robot Line-of-Sight Connectivity Maintenance under Uncertainty

Yupeng Yang, Yiwei Lyu, Yanze Zhang, **Sha Yi** and Wenhao Luo
Robotics: Science and Systems (RSS), 2024

Enhancing Heterogeneous Swarm Locomotion Through Simple 1-DOF Arm Mechanisms

James Clinton, **Sha Yi**, and Zeynep Temel
Distributed Autonomous Robotic Systems (DARS), 2024
Workshop in Tensegrity Robots, IROS, 2023, ***Best Demo Award***

Decentralized Model Predictive Control for Constrained Multi-Robot System

Allison J. Seo, **Sha Yi**, and Katia Sycara
Workshop in Advances in Multi-Agent Learning, IROS, 2023

Reconfigurable Robot Control Using Flexible Coupling Mechanisms

Sha Yi, Katia Sycara, and Zeynep Temel
Robotics: Science and Systems (RSS), 2023

Configuration Control for Physical Coupling of Heterogeneous Robot Swarms

Sha Yi, Zeynep Temel, and Katia Sycara
International Conference on Robotics and Automation (ICRA), 2022

PuzzleBots: Physical Coupling of Robot Swarms

Sha Yi, Zeynep Temel, and Katia Sycara

IEEE International Conference on Robotics and Automation (ICRA), 2021

Distributed Topology Correction for Flexible Connectivity Maintenance in Multi-Robot Systems
Sha Yi, Wenhao Luo, and Katia Sycara
IEEE International Conference on Robotics and Automation (ICRA), 2021

Multi-agent Deception in Attack-Defense Stochastic Game
Xueting Li, **Sha Yi**, and Katia Sycara
International Symposium on Distributed Autonomous Robotic Systems (DARS), 2021

Adaptive Informative Sampling with Environment Partitioning for Heterogeneous Multi-Robot Systems
Yunfei Shi, Ning Wang, Jianmin Zheng, Yang Zhang, **Sha Yi**, Wenhao Luo, and Katia Sycara
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020

Behavior Mixing with Minimum Global and Subgroup Connectivity Maintenance for Large-Scale Multi-Robot Systems
Wenhao Luo, **Sha Yi**, and Katia Sycara
IEEE International Conference on Robotics and Automation (ICRA), 2020

Indoor Pursuit-Evasion with Hybrid Hierarchical Partially Observable Markov Decision Processes for Multi-Robot Systems
Sha Yi, Changjoo Nam, Katia Sycara
International Symposium on Distributed Autonomous Robotic Systems (DARS), 2018

Work Experiences

Amazon Robotics   *North Reading, MA*
APPLIED SCIENTIST INTERNSHIP   *Jun 2022 - Aug. 2022*
    with *Dr. Andreas Kolling* on Multi-robot planning and control.

Google Summer of Code   *Virtual*
DEVELOPER   *May 2017 - Aug. 2017*
    with *Prof. Kei Okada* on collision avoidance for manipulation and humanoid, JSK Robotics Lab of *University of Tokyo*.

HAI Robotics   *Shenzhen, China*
ROBOTICS INTERNSHIP   *Mar. 2016 - May 2016*
    Implemented path planning algorithm for warehouse automation.

Microsoft   *Beijing, China*
SOFTWARE ENGINEER   *Jul. 2015 - Dec. 2015*
    Cloud and Enterprise division, Platform and Tools group.

Honors & Awards

MIT EECS Rising Star	*2025*
CMU Presidential Fellowship	*2021*
HKSAR Government Scholarship	*2014, 2015, 2016*

Academic Services

Reviewer	Conference: ICRA, IROS, WAFR, ACC, RoboSoft, RSS, CoRL; Journal: TRO, RAL, AURO
Workshop Organizer	ICRA 2024: Unconventional Robots: Universal Lessons for Designing Unique Systems RSS 2025: Brain and Brawn – Robot Hardware-Aware Intelligence CoRL 2025: Human to Robot: Sensorizing, Modeling, and Learning from Humans

Teaching Experiences

Math Fundamentals for Robotics   *Fall 2019, CMU*
Kinematics, Dynamics, and Control   *Spring 2020, CMU*

Diversity & Outreach Services

Robotics Institute Summer Scholars (RISS)   *2019, 2020, 2021, 2023*
   Served on the admission committee and reviewed applications.
   Mentored undergraduate students for three-month research projects.

Women@SCS/SCS4ALL Mentoring Program   *2020, 2021, 2022*
   Mentored undergraduate students from underrepresented backgrounds.
   Introduced students to research and helped them shape their career paths.

SCS Graduate Application Support Program (GASP)   *2020, 2021, 2022, 2023*
   Helped underrepresented students from outside of CMU for graduate school applications.
   Provided advice on resume and personal statements.

Talks

Learning to Design Soft Robots   *2025*
   Guest Lecture, Soft Robot, Fall 2025 UCSD
   Invited talk, Feed the Intellect Robotics Seminar, UCSD
   Invited talk, Robotics Discussion Group, Duke

Reconfigurable Robot Control Using Flexible Coupling Mechanisms   *2024*
   Guest Lecture, Soft Robot, Fall 2024 UCSD

Improving Robot Capabilities Through Reconfigurability   *2024*
   Invited talk, University of British Columbia
   Invited talk, UCSD (Host: Xiaolong Wang & Mike Tolley)
   Invited talk, REALM Lab, MIT (Host: Chuchu Fan)
   Invited talk, Sung Robotics Lab, UPenn (Host: Cynthia Sung)

Physical Coupling in Robot Swarms   *2023*
   Guest lecturer, Insects and Robots, Fall 2023 CMU
   Workshop on Tensegrity Robotics, IROS

Filling in the Gaps: Physical Coupling for Reconfigurable Robots   *2022*
   Workshop on Modular Self-Reconfigurable Robots, ICRA