Sha Yi

She/Her

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Research Interests

Computational design, control, and simulation of 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 soft 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

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

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

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

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

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