Yuyou Zhang

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EDUCATION

Carnegie Mellon University   **Pittsburgh, USA**
Ph.D. in Mechanical Engineering, Safe AI Lab   *Aug. 2022 - May 2027 (expected)*
Shanghai Jiao Tong University (SJTU)   **Shanghai, China**
B.Eng., Automation, School of Electronic Information Electrical Engineering
B.Eng., ZhiYuan Honors Program, Zhiyuan College   *Sept. 2018 - June 2022*

AWARDS

- Carnegie Institute of Technology Dean's Fellowship, 2022
- Shanghai Outstanding Graduate, Top 2.5%
- Zhiyuan Honors Degree, Top 1.5%
- Zhiyuan Honors Scholarship, 2018, 2019, 2020, 2021, Top 5%
- Undergraduate Excellence Scholarship 2018, 2019, 2020, 2021
- The Mathematical Contest in Modeling: Meritorious Winner, Top 3%

PUBLICATIONS

[1] **Y. Zhang**, Y. Niu, X. Liu, and D. Zhao, "Composer: Scalable and robust modular policies for snake robots," *arXiv preprint arXiv:2310.00871*, 2023.

[2] C. Wang, **Y. Zhang**, X. Zhang, Z. Wu, X. Zhu, S. Jin, T. Tang, and M. Tomizuka, "Offline-online learning of deformation model for cable manipulation with graph neural networks," *IEEE Robotics and Automation Letters*, vol. 7, no. 2, pp. 5544–5551, 2022.

[3] L. Han, **Y. Zhang**, and H. Wang, "Vision-based contact point selection for the fully non-fixed contact manipulation of deformable objects," *IEEE Robotics and Automation Letters*, vol. 7, no. 2, pp. 4368–4375, 2022.

[4] L. Han, **Y. Zhang**, and H. Wang, "Hybrid adaptive vision-force control under the bottleneck constraint," *IEEE Transactions on Control Systems Technology*, 2022.

[5] F. Xu, **Y. Zhang**, J. Sun, and H. Wang, "Adaptive visual servoing shape control of a soft robot manipulator using bézier curve features," *IEEE/ASME Transactions on Mechatronics*, 2022.

SELECTED RESEARCH

Safe AI Lab   **Carnegie Mellon University**
Research Assistant   *Aug 2022 - present*

   COMPOSER: Scalable and Robust Modular Policies for Snake Robots [1]
- Proposed a modular policy with a self-attention mechanism to enhance cooperative behaviors
- Employed a high-level imagination policy to enable more efficient learning
- Demonstrated superior efficiency, robustness against corruption, and zero-shot generalizability.

Mechanical Systems Control Lab   **University of California, Berkeley**
Undergraduate Researcher   *June 2021 - Nov. 2021*

   Offline and Online Deformation Model Learning for Robust Cable Manipulation with Graph Neural Networks [2]
- Combined offline graph neural network with online residual model to approximate cable dynamics
- Demonstrated faster convergence and less terminal error compared to baselines algorithms
- Improved model training efficiency and generalizability, narrowed sim-to-real gap.

Intelligent Robotics and Machine Vision Lab   **Shanghai Jiao Tong University**
Undergraduate Researcher   *Sept. 2020 - June 2022*

   Safe Vision-based Contact Selection for the Non-fixed Contact Manipulation of Deformable Objects[3]
- Proposed a stabilizing and optimization strategy to select initial manipulation contact points

- Designed an uncalibrated visual servo controller to validate the contact optimization strategy

Hybrid Vision-Force Control for Robotics Manipulation in Confined Space[4]
- Developed an adaptive method to estimate Jacobian matrixes in force space and image space
- Designed a hybrid vision-force controller for manipulation with a desired contact force

Adaptive Visual Servoing Shape Control of A Soft Robot Manipulator Using *Bézier* Curve Features[5]
- Proposed an adaptive *Bézier* curve update algorithm to represent soft continuum robots
- Designed an uncalibrated visual servo controller for shape regulation of the soft continuum robot

EMPLOYMENT

Flexiv Robotics Inc.
Robotic Vision Intern   *Dec. 2021 - Mar. 2022*
- 3D reconstruction and point cloud registration
- Point cloud feature extraction and visual fixture generation for interactive teleoperation

Shanghai Inspection and Testing Institute of Instruments and Automation Systems Co. Ltd.
Engineer Intern   *June. 2021 - Aug. 2021*

SKILLS

- **Programming Languages**: Python, C/C++, Javascript
- **Software & Tools**: Pybullet, ROS, Matlab, Abaqus, Gmsh, SolidWorks, AutoCAD