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 *Sept. 2018 - June 2022*
B.Eng., ZhiYuan Honors Program, Zhiyuan College

AWARDS

- 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%

SELECTED RESEARCH

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

Learning Universal Modular Controller for the Soft Robot Manipulation [Ongoing]

- Proposed to learn an modular policy based on module proprioception and joint proprioception
- Improved modular equilibrium policy convergence by learning to infer between modules

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 [1]

- Combined offline graph neural network with online residual model to approximate cable dynamics
- Proposed a model predictive control framework for robust cable deformation control
- 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[2]

- 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[3]

- 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[4]

- 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*

PUBLICATIONS

[1] 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.

[2] 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.

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

[4] 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.

SKILLS

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