

Yuyou Zhang

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EDUCATION

Shanghai Jiao Tong University (SJTU)

China

B.S. in Automation, School of Electronic Information Electrical Engineering Sept. 2018 - June 2022

(Honors Program) GPA : 3.83/4.00 (two-year) 3.64/4.00 (cumulative)

Relevant Coursework: Robotics(95), Pattern Recognition(95), Modern Control Theory(91), Nonlinear System(91), Principle of Automatic Control(92), Humanoid Robotics and Artificial Intelligence(91), Engineering Mechanics(90), Artificial Intelligence(90), Digital Signal Processing(94), Discrete Mathematics(91)

Scholarship: Zhiyuan Scholarship in 2018, 2019, 2020 (Top 5%)

SELECTED RESEARCH EXPERIENCE

Mechanical Systems Control Lab

University of California, Berkeley

Undergraduate Researcher

June 2021 - Nov. 2021

Offline and Online Deformation Model Learning for 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 graph neural network training efficiency and significantly narrowed sim-to-real gap.

Intelligent Robotics and Machine Vision Lab

Shanghai Jiao Tong University

Undergraduate Researcher

Sept. 2020 - Present

Vision-based Contact Selection for the Fully Non-fixed Contact Manipulation of Deformable Objects[2]

- Proposed a contact optimization strategy to select the initial contact points and minimized the rotational or sliding motion of deformable objects during shape servoing
- Considered joint limits and singularities by introducing constraints to the contact optimization
- Designed an uncalibrated visual servo controller to validate the contact optimization strategy

Hybrid Vision-Force Control for Robotics Manipulation in Confined Space[3]

- Derived the kinematic formulation of a generalized constraint for confined robot workspace
- Developed an adaptive method to respectively estimate the Jacobian matrix online 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 curves update algorithm to represent the shape of the soft continuum robot, and a feature extraction algorithm without man-made markers
- Designed an uncalibrated visual servo controller for shape regulation of the soft continuum robot

SKILLS

- **Programming Languages:** Python, C/C++, Java
- **Software & Tools:** Matlab, ROS, TensorFlow, Abaqus, Gmsh, SolidWorks, AutoCAD
- **Languages:** Mandarin (native), English (proficient, TOEFL: 109, S: 24)

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 (submitted for publication), 2021.
- [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 (submitted for publication), 2021.
- [3] L. Han, **Y. Zhang**, and H. Wang, "Hybrid vision-force control for interaction with the bottle-like object." IEEE Transactions on Control Systems Technology (submitted for publication), 2021.
- [4] F. Xu, **Y. Zhang**, S. Jing, H. Wang, and W. Chen, "Adaptive visual servoing shape control of a soft robot manipulator using bézier curve features." IEEE Transactions on Mechatronics (submitted for publication), 2021.