ZHIXUAN XU

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EDUCATION

Zhejiang University, Hangzhou, Zhejiang, China   09/2020-Present
Bachelor of Engineering in Robotics Engineering (Chu Kochen Honor College)
  GPA: 3.96/4.0(90.7/100)   Rank: 2/33
  Double Major: Computer Science and Technology (in Progress)
  Micro-minors: "AI+X" Program (Completed) Co-organized by East China Five Schools, Huawei, Baidu, etc.

Massachusetts Institute of Technology , Cambridge, MA, USA   07/2021-08/2021
Machine Learning Plus in Autonomous Driving Summer Online Program
  Group Leader, Score: 97.5/100+

PUBLICATIONS

1. Gang Yang, **Zhixuan Xu**, Zixuan Liu, Jichen Sun, Hanwei Fan, Xinghao Zhu, Lin Shao.*UniContact: A Basic Model for Robotic Manipulation of Contact Synthesis on Rigid and Articulated Rigid Bodies with Arbitrary Manipulators.* Under Review: Submitted to International Conference on Learning Representations (ICLR2024).

2. Xinghao Zhu, Jinghan Ke, **Zhixuan Xu**, Zhixin Sun, Bizhe Bai, Jun Lv, Qingtao Liu, Yuwei Zeng, Qi Ye, Cewu Lu, Masayoshi Tomizuka and Lin Shao. *Diff-LfD: Contact-aware Model-based Learning from Visual Demonstration for Robotic Manipulation via Differentiable Physics-based Simulation and Rendering.* The 7th Annual Conference on Robot Learning (CoRL 2023). Oral Presentation(6.6%).

3. **Zhixuan Xu**, Kechun Xu, Yue Wang and Rong Xiong. *Object-centric Inference for Language Conditioned Placement: A Foundation Model based Approach.* The IEEE International Conference on Advanced Robotics & Mechatronics (ICARM 2023).

RESEARCH EXPERIENCES

Research Assistant, LinS Lab, National University of Singapore   03/2023-Present
Model-based Learning from Visual Demonstration
- Proposed a self-supervised approach to reconstruct and extract object shapes and 6D poses from monocular human demonstration RGB videos by using differentiable rendering.
- Combined global contact sampling with a robust gradient approximation technique for model-based robotic manipulation with the aid of differentiable simulation.

Robotic Manipulation Foundation Model for Contact Synthesis
- Generated a large scale dataset for contact synthesis and developed a neural network for arbitrary manipulators to choose contact positions on a random rigid or articulated rigid object to generate a specified target wrench.
- Proposed a collision-free optimization framework to optimize robot configurations, contact force and positions.

Advisor: Prof. Lin Shao

Research Intern, Robotics Lab, Zhejiang University   10/2022-02/2023
Learning Language-conditioned Manipulation
- Proposed to leverage pre-trained large language models and visual language models, and to train residual blocks for better generalization to unseen instructions and objects, and for higher sample efficiency.

Advisors: Prof. Rong Xiong and Prof. Yue Wang

Research Training, Robotics Lab, Zhejiang University   05/2021-05/2022
Object Detection with Millimeter Wave Radar
- Project Leader. Implemented a network to fuse camera and radar information to improve object detection robustness. The project is evaluated as top-10 outstanding.

Advisors: Prof. Rong Xiong and Prof. Yue Wang

COMPETITIONS AWARDS

1. **First Prize** of the 13th National University Mathematics Competition (Non-Mathematical Category)
2. **First Place** in the 16th "China Control Cup" Robotic Competition for College Students of Zhejiang University
3. **First Place** in the 3rd Zhejiang University Intelligent Robot Competition
4. **Honorable Winner** in 2022 Mathematical Contest in Modeling

HONORS & FELLOWSHIPS

2021&2022	Zhejiang Province Scholarship
2021&2022	Zhejiang University School Scholarship
2022	Chu Kochen Honor College Pioneer Scholarship
2022	Top 10 In-depth Research Training Program at Chu Kochen Honor College

SKILLS & INTERESTS

Self-built Robots: Mobile Manipulators, A Quadcopter, A Holographic Imaging System, etc.

Language: Chinese(Native), English(TOEFL:98, GRE:323+4.0)

Programming: Python, C/C++, MATLAB

Tools: LaTeX, Blender, SOLIDWORKS, STM32, Arduino

Interests: Singing, Reading, Table Tennis