# Yilin Wu

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## EDUCATION

**Stanford University** *Sept. 2021 - Jun. 2023*

M.S. in Computer Science GPA: **4.07/4.3**

- Selected Coursework: Computer Graphics, Computer Vision, Decision Making, Algorithm Toolbox, Robot Autonomy

**Shanghai Jiao Tong University** *Sept. 2016 - Jun. 2020*

B.S. in Information Security Rank: **1/104** GPA: **91.89/100**

- Selected Courswork: Data Structure and Algorithm, Linear Algebra, Probability Theory, Operating System, Computer Network, Compiler, Information Theory, Database, Computer Organization, Cryptography

**University of California, Berkeley** *Jan. - May. 2019*

International Exchange student in Spring Semester GPA: **4.0/4.0**

- Selected Coursework: Artificial Intelligence, Computer Security, Computing with Data

## PUBLICATION

**In-Mouth Robotic Bite Transfer with Visual and Haptic Sensing**
Lorenzo Shaikewitz*, Yilin Wu*, Suneel Belkhale*, Jennifer Grannen, Priya Sundaresan, Dorsa Sadigh
Under review for *International Conference on Robotics and Automation (ICRA)*, May. 2023
Preprint: https://arxiv.org/abs/2211.12705

**Learning Bimanual Scooping Policies for Food Acquisition**
Jennifer Grannen*, Yilin Wu*, Suneel Belkhale, Dorsa Sadigh
*The Conference on Robot Learning (CoRL)*, Dec. 2022
Preprint: https://arxiv.org/abs/2211.14652

**Solving Compositional Reinforcement Learning Problems via Task Reduction**
Yunfei Li, Yilin Wu, Huazhe Xu, Xiaolong Wang, Yi Wu
*The International Conference on Learning Representations(ICLR)*, May. 2021
Preprint: https://arxiv.org/abs/2103.07607

**Learning to Manipulate Deformable Objects without Demonstrations**
Yilin Wu*, Wilson Yan*, Thanard Kurutach, Lerrel Pinto, Pieter Abbeel
*Robotics: Science and Systems(RSS)*, July. 2020
Preprint: https://arxiv.org/abs/1910.13439

## RESEARCH EXPERIENCE

**Stanford Intelligent and Interactive Autonomous Systems Group (ILIAD)** *Sept. 2021 - Present*
*Research Assistant supervised by Prof. Dorsa Sadigh*

### Learning Bimanual Scooping Policies for Food Acquisition

- Proposed a bimanual scooping primitive with closed-loop visual feedback and an adaptive stabilization learning strategy.
- Built the first bimanual multi-food scooping system, robust to 14 food types with varied geometries and deformability.
- Achieved 87% success rate on rigid foods, 26% more than single-arm baseline, and reduced food breakage by 16%.

### In-mouth Robotic Bite Transfer with Visual and Haptic Sensing

- Introduced a novel dexterous wrist-like end effector capable of small unimposing movements to reduce user discomfort.
- Design a phase-specific force-reactive controller enabling comfortable physical interactions during the in-mouth transfer.
- Utilized depth scan of food items and facial keypoint to locate the target position and conducted qualitative and quantitative evaluation over 11 users.

**Shanghai Qi Zhi Institute** *Sept. 2020 - Jun. 2021*
*Research Assistant supervised by Prof. Yi Wu*

**Solving Compositional Reinforcement Learning Problems via Task Reduction**

- Tackled compositional, sparse-reward tasks with automatic task-reduction and self-imitation in RL framework (PPO&SAC).
- Accelerated training on various challenging tasks, e.g. maze navigation, and reached 60% more success in stacking task.
- Applied to visual domain by sampling in the latent space of $\beta$-VAE and improved sample efficiency over baselines.

**Berkeley Artificial Intelligence Research Lab, UC Berkeley** *May. 2019 - Sept. 2019*
*Research Assistant supervised by Prof. Pieter Abbeel*

**Learning to Manipulate Deformable Objects without Demonstrations**

- Proposed a model-free visual RL framework with universal value function and conditional action space, thus speeding up the learning by an order of magnitude.
- Built the cloth and rope simulation in Mujoco and used domain randomization to transfer the policy to real robot PR2.
- Became the first to train RL from scratch for deformable object manipulation and demonstrated it on the real robot.

## WORK & TEACHING EXPERIENCE

**Stanford University Computer Science Department** *Sept. 2021 - Present*
*Teaching Assistant*

- CS 221 Artificial Intelligence: Principles and Techniques *Fall 2021, Spring 2022*
- CS 182 Ethics, Public Policy, and Technological Change *Winter 2022*
- CS 148 Introduction to Computer Graphics and Imaging *Fall 2022*

**Applied Deep Learning Research, Nvidia Corporation** *Jun. 2022 - Sept. 2022*
*Research Intern*

**Improving Efficiency in Model-Based Distributed Reinforcement Learning**

- Extended EfficientZero algorithm to continuous action space to improve sample efficiency over Sampled Muzero.
- Deployed concurrent training and data collection in distributed RL and Batch MCTS in continuous Efficientzero to train 2-3 times faster than Sampled Muzero in locomotion tasks.

## SKILLS

**Programming Skills:** Python, PyTorch, TensorFlow, C++/C, Git, LaTeX, Verilog

**Robotic Simulation and Control Platforms:** ROS, Pybullet, Mujoco, IsaacGym

**Robots Used:** Franka Panda, PR2, Xarm7, UR16

## SCHOLARSHIP, HONORS & PROFESSIONAL ACTIVITIES

Paper Reviewer, Robotics: Science and Systems(RSS) Imitation Learning Workshop 2022

Graduated with honor *(Outstanding Graduate of Shanghai)* *2020*
*(5 among 104 graduates in Information Security)*

Hongyi Scholarship *2019*
*(∼3800 USD, Top 10 Summer Research among Undergraduates)*

National Scholarship *2017*
*(awarded to ∼ 0.2% undergraduates national wide)*