# YIXUAN WANG

+1(217) 898-8544 ◇ yixuan22@illinois.edu ◇ Urbana, IL

## EDUCATION

**University of Illinois, Urbana-Champaign** 09/2021 - 09/2026 (expected)
Ph.D. in Electrical and Computer Engineering GPA: 3.83/4.00

**University of Michigan, Ann Arbor** 09/2019 - 05/2021
B.S. in Computer Science GPA: 3.94/4.00

**Shanghai Jiao Tong University** 09/2017 - 08/2021
B.S.E. in Mechanical Engineering GPA: 3.81/4.00

## PUBLICATION

**Wang. Y.**, McConachie, D., Berenson, D., "Tracking Partially-Occluded Deformable Objects while Enforcing Geometric Constraints", *The 2021 International Conference on Robotics and Automation (ICRA 2021).*

## ACADEMIC EXPERIENCE

**UIUC Intelligent Motion Lab** 09/2021 - present
*Project: Robust Deformable Linear Object Tracking* *Supervisor: Prof. Kris Hauser*

- Formulated deformable linear object tracking as a non-linear optimization problem using only RGBD images as input.
- Apply learning to increase tracking robustness.

**UIUC Advanced Topics in Robot Perception** 09/2021 - 12/2021
*Project: Non-rigid 3D Reconstruction of Articulated Objects* *Supervisor: Prof. Shenlong Wang*

- Proposed two methods for approximating motions from point cloud of articulated objects based on ICP algorithm and clustering algorithm respectively.
- Studied reconstruction errors and geometric errors based on simulated data generated from Sapien dataset.

**UM-SJTU Joint Institute Capstone Design** 05/2021 - 08/2021
*Project: Information Fusion of mmWave Radar and Image Sensors* *Supervisor: Prof. Xuyang Lu*

- Built a system integrating mmWave radar sensor and image sensor for object detection task.
- Sped up Faster RCNN by replacing proposal network with detection point from mmWave radar sensor from 11.6 FPS to 13.8 FPS on the same hardware.
- Won silver medal (only 3 projects) among 40 projects.

**UMich Autonomous Robotic Manipulation Lab** 05/2020 - 08/2021
*Project: Learning-based Probabilistic Motion Planning* *Supervisor: Prof. Dmitry Berenson*

- Proposed to improve Rapidly-exploring Random Tree (RRT) algorithm by incorporating a reinforcement learning policy that reasons the environment.
- Reduced RRT iteration numbers by 80% while improved success rate from 87.1% to 98.4% in random generated environments with box obstacles.
- Analyzed reason for bad performance of our method in corner cases like narrow passages.

*Project: Robust Deformable Object Tracking* *Supervisor: Dr. Dale McConachie*

- Preserved deformable object tracking results' geometric correctness during self-intersection and obstacle interaction by improving posterior constraints of Gaussian Mixture Model-Expectation Maximization (GMM-EM) algorithm.

- Obtained deformable object tracking results that are more robust to the occlusion by incorporating prediction model of deformable object into objective function of GMM-EM algorithm.
- Validated ideas in simulation environment and real experiments.
- Wrote the research paper targeting at ICRA 2021.

**UMich Compliant Systems Design Laboratory** 09/2019 - 04/2020
*Model-free Control over Soft Robots' Shape based on Visual Information* *Supervisor: Dr. Audrey Sedal*

- Segmented soft robots in real time based on texture segmentation using Gabor filter and k-means clustering.
- Represented soft robots' shapes as Bezier curve and tracked soft robots using curve fitting.
- Applied Deep Q-Learning to learn soft robot control policy.

## SERVICE

**Conference Reviewer: ICRA 2022**
**Peer Consultant, UM-SJTU Joint Institute Advising Center** 09/2018 - 08/2019
**Minister of Propaganda, SJTU Student Union Secretariat** 03/2019 - 08/2019

## TEACHING

**Honor Physics I, UM-SJTU Joint Institute** 05/2019 - 08/2019
**Honor Calculus II, UM-SJTU Joint Institute** 09/2018 - 12/2018

## HONOR & AWARDS

| | |
|---|---|
| Silver Medal for Capstone Design | 08/2021 |
| Shanghai Excellent Gradudate (Top 5%) | 08/2021 |
| University Honors | 12/2019, 04/2020 |
| Dean's List | 12/2019 |
| Jackson and Muriel Lum Scholarship | 09/2019 |
| Undergraduate Merit Scholarship (Top 10%) | 08/2018, 08/2019 |
| National Encouragement Scholarship | 09/2018 |
| John Wu & Jane Sun Sunshine Scholarship | 09/2018 |
| SJTU Outstanding Student | 09/2018 |
| Yu Liming Scholarship | 09/2017 |

## SELECTED COURSES

| | |
|---|---|
| **Computer Science** | Data Structure and Algorithm, Applied Linear Algebra, Introduction to Embedded System Design, Introduction to Machine Learning, Computer Vision, Autonomous Robotics, Deep Learning for Computer Vision (graduate level), Motion Planning (graduate level) |
| **Mechanical Engineering** | Introduction to Solid Mechanics, Introduction to Dynamics and Vibrations, Design and Manufacturing I, Design and Manufacturing II, Dynamic Systems |

## SKILLS

| | |
|---|---|
| **Programming** | C++, MATLAB, C, Python, ARM |
| **Application** | CATIA, Origin, SolidWorks, Arduino, LabVIEW, OpenCV, SmartFusion, PyTorch, Qt, ROS, Blender |