YEXIN ZHANG

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EDUCATION

University of Pennsylvania — **Philadelphia, PA, United States**
Master of Science in Engineering, Aritificial Intelligence and Robotics — *Sep 2023 - May 2025 (Expected)*

ShanghaiTech University — **Shanghai, China**
Bachelor of Engineering in Electrical and Information Engineering — *Sep 2019 - Jun 2023*

EXPERIENCE

AMNR Lab, ShanghaiTech University — **Shanghai, China**
Research Assistant — *Jun 2021 - Jun 2023*

- **Acoustic Tweezer System Construction**
  - Developed a C++ Qt-based application, enhancing research efficiency by building user interface, creating functions for real-time image display and recording, task execution, and experiment data storage and visualization.
  - Filtered out noise from the oscilloscope by designing a high-pass filter, improving the SNR by a factor of 11.5.
  - Calibrated the micro camera with MATLAB, achieving average localization accuracy with only a 39 um error.
- **Noncontact Particle Vision-Servo Manipulation on Water Surface**
  - Created a feature extraction algorithm for particle localization using OpenCV, achieving precision of sub-pixel.
  - Realized automated trapping of PS particles and droplets through the implementation of an acceleration model.
  - Achieved precise position servo and orientation control with an error within 16 um and 0.89 degrees.

Procter & Gamble — **Remote**
Supply Chain Engineering Trainee Program: Automated Palletizing — *Apr-Jun 2023*

- Implemented an object detection algorithm using Open3D and OpenCV, achieving a 97.5% accuracy in recognizing multiple boxes against complex backgrounds based on point clouds and grayscale images.
- Collaborated with the team to test the algorithm, improving overall object detection capabilities of the robot.

PROJECTS

F1TENTH Autonomous Vehicle System — *Jan 2024 - Now*

- Developed a LiDAR-based autonomous car using ROS2 in Python, realizing high-speed and accurate navigation.
- Implemented SLAM and particle filter for accurate mapping and localization, utilizing RRT* and Pure Pursuit algorithms for optimal path finding and control, significantly enhancing the vehicle's navigation efficiency.

NeRF for Bulldozer Scene Reconstruction — *Dec 2023*

- Rendered and reconstructed a detailed 3D bulldozer model based on 2D images using PyTorch and CUDA.
- Fine-tuned model parameters, achieving a PSNR of 24.56 for high-fidelity and accuracy scene reproduction.

Two-view Reconstruction for Dioskouroi Temple — *Nov 2023*

- Developed a two-view stereo algorithm to transform 2D images into depth map using Python.
- Optimized the reconstruction by extracting precise 3D point clouds and implemented visualization using K3D.

Deep Learning Vision Project - CIFAR-10 Classification — *Nov 2023*

- Trained a deep learning model(CNNs) on the CIFAR-10 dataset for object classification using PyTorch.
- Implemented data shift and augmentation to enhance model performance, resulting in a peak accuracy of 78.2%.

COMPETITION

2021 Xilinx China Women in Technology Hackathon — *Oct 2021*
Runner-up and Best Innovation Award in China Region, Winner in Shanghai Division

- Led a team of 3 in developing a guide car for visually impaired using Xilinx PYNQ-Z2 development board.
- Achieved high navigation accuracy through meticulous testing and optimization of a PID controller system.

TECHNICAL SKILLS

Programming Languages Python, C/C++, MATLAB, HTML/CSS, Verilog
Other Skills ROS2, PyTorch, OpenCV, Open3D, Qt, Git, Linux, AWS, Kinematics, Gazebo, RViz, RL

PUBLICATIONS

- Y. Zhang et al., "Noncontact Particle Manipulation on Water Surface with Ultrasonic Phased Array System and Microscopic Vision," 2023 IEEE International Conference on Robotics and Automation (ICRA), London, United Kingdom, 2023, pp. 5459-5465, doi: 10.1109/ICRA48891.2023.10160724.

**Supervised by Prof. Song Liu | Advanced Micro-Nano Robot Lab | ShanghaiTech University*