

YEXIN ZHANG

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EDUCATION

University of Pennsylvania

Master of Robotics

ShanghaiTech University

Bachelor of Engineering in Electrical and Information Engineering

Pennsylvania, United States

Sept.2023-May .2025(*expected*)

Shanghai, China

Sept.2019-Jun.2023

EXPERIENCE

P&G: Palletizing Robot

Robotics Engineering Intern

Apr.2023-Present

Shanghai, China

- Developed and implemented a robust algorithm for recognizing multiple boxes in complex backgrounds based on point clouds and gray-scale images using Open3D. Achieved an accuracy rate of 97.5%.
- Calculated the transformation matrix between robot coordinate system and camera coordinate system.
- Designed and created an efficient path-planning strategy model for a palletizing robot using Matlab.

PROJECTS

Acoustic Tweezer System Construction

June.2021-May.2022

- Built a phase-modulated wave generator for FPGAs using Verilog;
- Designed and implemented a Butterworth high-pass filter to reduce noise from DAQ unit in C++.
- Created the Acoustic Tweezer system interface using Qt frame;
- Conducted calibration of the image Jacobian matrix using the least mean square method and evaluated the accuracy of the system;

Non-contact Manipulation on Water Surface

Feb-Aug.2022

- Proposed a novel acoustic vortex beam generation method based on Fresnel half-wave bands interference principle.
- Implemented end-effector simulations based on the angular spectrum method using Python;
- Designed and implemented a feature extraction algorithm for particle localization using OpenCV;
- Realized automated trapping of PS particles and droplets based on acceleration model;
- Developed a closed-loop controller for precise positioning and motion planning.

Assembly of Micro-Object with Large Aspect Ratio

Nov.2022-Present

- Proposed an adaptive polarized circular acoustic field as the end-effector for manipulating objects with a large aspect ratio;
- Implemented precise position servo and orientation control techniques for target objects, ensuring accurate manipulation.
- Successfully achieved high-precision assembly of surface-mounted LEDs onto flexible circuit boards.

DC-DC Boost Circuit Controller Design

Oct-Dec.2021

- Modeled a DC-DC boost converter circuit in a nonlinear system standard form and transferred it into a linearized system;
- Completed the controllability, stability, and observability analysis via simulation using MATLAB Simulink;
- Tested the robustness of the system by adding white noise to the system and evaluated its performance.

Home Security System Design

Nov.2020

- Designed a state transition diagram for the working process of the home security system;
- Wrote a Finite State Machine to realize the workflow of the system using VHDL on Vivado.

COMPETITION EXPERIENCE

2021 Xilinx China Women in Technology Hackathon

Oct.2021

Runner-up and Bset Innovation Award in China Region, Winner in Shanghai Division

- Led a team to develop a smart line-tracking car using Xilinx PYNQ-Z2 FPGA development board.
- Implemented Joystick control, orientation guidance, obstacle avoidance, and trajectory tracking functions;
- Demonstrated innovative solutions for the visually impaired by combining voice recognition and Bluetooth remote control.

PUBLICATIONS

- **Noncontact Particle Manipulation on Water Surface with Ultrasonic Phased Array System and Microscopic Vision**
First Author, Admitted by IEEE International Conference on Robotics and Automation 2023, London, U.K.
- **Acoustic micro-assembly with Ultrasonic Phased Array and Microscopic Vision**
First author, submitted under preparation to IEEE Transactions on Robotics.
- **Selective Non-contact Particle Manipulation with Ultrasonic Phased Transducer Array and Microscope**
Second Author, submitted to IEEE Transactions on Automation Science and Engineering.

**Supervised by Prof. [Song Liu](#) | [Advanced Micro-Nano Robot Lab](#) | ShanghaiTech University*

TECHNICAL SKILLS

Programming Languages	C/C++, Python, MATLAB, JAVA, HTML/CSS, Verilog, VHDL
Other Tools	OpenCV, Qt, Open3D, Git, Solidworks, Unity(Vuforia), Vivado, Multism