Chengjie Zhang

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EDUCATION

University of Michigan Ann Arbor **09/2023-04/2025 (expected)**
Mechanical Engineering MSE
GPA: 3.763 (Year 1)

University of Nottingham Ningbo China **09/2019-06/2023**
BEng Hons Aerospace Engineering
GPA: 3.93/4.0 (Rank: Top 10%)

RESEARCH INTERESTS

Robotics learning, Robotics manipulation, Machine learning.

RESEARCH EXPERIENCE

Automated Block Stacking with Color Recognition and Robotic Arm Manipulation
Lab course **01/2024-04/2024**

- Build autonomy for a 5-DOF robotic arm, utilizing computer vision techniques, kinematics, and path planning to enable the robot to manipulate various objects.
- Utilized AprilTag for camera calibration, and the Denavit-Hartenberg (DH) method was employed for computing forward kinematics, along with geometric methods for inverse kinematics.
- A combination of OpenCV and a depth camera was used to detect and locate different color blocks. By recognizing different color blocks in the RGB camera and determining their position in the world coordinate system, successful grasping was achieved.

Autonomous Maze Exploration and Mapping with A* Navigation on Mbot
Lab course **01/2024-04/2024**

- Use an autonomous maze-solving robot to perceive its surroundings, map the environment, and implement A* algorithm for self-navigation.
- Assembled and controlled an MBot, including the design of a gripping mechanism.
- Implemented PID feedback control for motor speed and developed a velocity-command-based robot motion controller.
- Utilized Lidar for 2D mapping, built a SLAM system for environment mapping and localization.
- Implemented A* algorithm for map navigation.

Recognition and removal of Private Content in Smart Home Vacuum
Individual project **09/2023-12/2023**

- Use machine learning method and pretrained yolov8x model to help robot identifying private actions and preventing the private content to be recorded in the hard disk.
- Training and validation subsets ratio of 80% and 20%, the total dataset contains 300 photos which are labeled to private or normal class.
- Mean average precision of identifying private photos achieved 93%.

Sensorless field-oriented control of Brushless DC motor used in unmanned aerial vehicle

Individual project **09/2022-05/2023**

- Established mathematical model of Brushless DC motor, simulated in Matlab/Simulink, and analyze the output of the motor model.
- Examined the control methods, including LQR method, sliding mode control method, and FOC method.
- Established nonlinear observer model to observe the parameters of BLDC motor.
- Realized sensorless field-oriented control of Brushless DC motor.

Rapid 3D Printing System with Screw Extruded Granular Materials based on Vibration-assisted Tamping **Research Assistant** **09/2020-06/2021**

- Build 3D models of the print head, 3-axis stage, automated feeding system, and machine housing and performed stress analysis of load-bearing components in SolidWorks.
- Improved the control system in CODESYS.
- Identified the optimum parameter setting for the system with the help of Cura.
- Won the Third Prize in the Provincial Competition of ECA. Academic and Technical Works.

INTERNSHIP

Software Engineer **05/2024-08/2024**

Dassault Systemes

- Developed robot surfacing drilling and riveting interfaces using C++ in Visual Studio and implemented functions and methods for Enterprise Knowledge Language (EKL) scripts in 3DEXPERIENCE.

TECHNICAL SKILLS

- Programming languages: C ++, Python.
- Software capabilities: Vscode, Visual Studio, PyCharm, Git, Oracle VM Virtualbox, Cura, SolidWorks, Ansys, 3DEXPERIENCE, AutoCAD, Matlab/Simulink, Microsoft office 365.
- Operating system: Linux (Ubuntu), Mac OS, Windows OS.

HONORS

Outstanding graduates of University of Nottingham Ningbo China **07/2023**
Outstanding Graduate of Zhejiang Province **03/2023**
Dean's Scholarship **12/2022**
Dream Scholarship **11/2022**
Zhejiang Provincial Scholarship **10/2022**
Third Prize, Provincial Competition of ECA. Academic and Technical Works **05/2021**