Tsai-Hsu (Chelsea) Wu

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EDUCATION

University of Michigan **Ann Arbor, MI**
Master of Science in Robotics Aug. 2024 - May 2026
Coursework: Mobile Manipulation Systems, Robotic Systems Lab, Introduction to Algorithmic Robotics

National Taiwan University (NTU) **Taipei, Taiwan**
Bachelor of Science in Mechanical Engineering Sep. 2019 - Jun. 2023
Areas of Concentration: Mechanical Design and Robotics

SKILLS

Design and Fabrication: CAD (Creo, Inventor, AutoCAD, SOLIDWORKS), Prototyping (3D Printing, Laser Cutting), FEA (Abaqus), Soldering, Machine Shop Operations (Mill, Lathe, Drill Press, Grinding Machine, Welding), Mastercam

Programming: Python, C++, C# (Unity), JavaScript, Arduino, MATLAB, ROS, OpenCV, PyBullet, Git

WORK EXPERIENCE

SYNTEC Technology **Hsinchu, Taiwan**
Robotics Product Engineer Aug. 2023 - Jul. 2024

- Refined robot controller cabinet design using Creo, reducing volume by 33%; met specifications such as IP54 protection to prevent oil mist damage to components, and incorporated DFM principles to simplify assembly
- Benchmarked current designs of products including robotic arms, servo drivers, and teach pendants; troubleshot issues and created manual for an integrated robot controller

RESEARCH EXPERIENCE

NTU Bio-Inspired Robotics Laboratory **Taipei, Taiwan**
Automated Fruit Bagging Robot, Undergraduate Researcher Sep. 2021 - Sep. 2023

- Collaborated with a team to develop a fruit bagging robot, integrating novel bagging mechanism with depth camera and robotic arm, increasing efficiency by 20% over conventional handheld methods
- Designed bagging mechanism with Inventor/AutoCAD and prototyped using 3D printing and laser cutting
- Awarded CTCI Innovation and Creativity Scholarship; research published in iRobotics with patent pending

Intelligent Sensing and Digital Manufacturing Lab **Taipei, Taiwan**
Spindle Thermal Compensation Model, Undergraduate Researcher Sep. 2022 - Jun. 2023

- Built a GAN model in Python using TensorFlow to predict thermal displacement, reducing machine tool error
- Co-authored Sensors and Materials journal paper, presenting a comprehensive analysis of various machine learning model predictions and demonstrating sustained Z-direction accuracy of 70% to 85% over six months

PROJECT EXPERIENCE

5-DOF Autonomous Robotic Arm **Ann Arbor, MI**
Robotic Systems Lab, University of Michigan Jan. 2025 - Present

- Engineered an autonomous robotic arm in Python via computer vision and kinematics: performed 3D image calibration and object detection using OpenCV; implemented forward and inverse kinematics for object manipulation

Autonomous Wind-Powered Vehicle **Taipei, Taiwan**
Practice of Mechanical Engineering, NTU Feb. 2022 - Jun. 2022

- Led a team of six to develop a wind-powered car; fabricated an Arduino-based mechatronic system to control motor and servo, enabling stable steering, hill climbing, and line following with infrared sensors
- Participated in chassis design, utilizing laser cutting for rapid prototyping and design iteration; performed finite element analysis (FEA) validating a 27% reduction in deformation and improved vibration performance

Automated Pipe Measuring System **Taipei, Taiwan**
Machine Design Theory, NTU Sep. 2021 - Jan. 2022

- Led machine design of measuring and transportation system for pipes within specified size range, integrating precision positioning mechanisms and LVDT for high-accuracy inner diameter measurement and defect detection
- Validated motor power and measurement precision, optimizing part selection based on performance and reliability; simulated assembly operation and generated mechanical drawings and BOMs from Inventor CAD models