

Brandon Wang

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EDUCATION

Duke University

Bachelor of Engineering in Mechanical Engineering

Certificate in Robotics & Automation

GPA: 3.644

Durham, NC

Aug. 2021 – May 2025

EXPERIENCE

Undergraduate Research Assistant

Duke University - General Robotics Lab

Aug. 2024 – Present

Durham, NC

- Conducted research on the development of a modular robotic system aimed at enhancing reconfigurability and scalability in robotics
- Designed and implemented a motor-actuated hook latching mechanism for secure attachment/detachment between module interfaces
- Contributed to localization and peer-to-peer communication architecture via TCP

Undergraduate Research Assistant

Duke University - Brinson Group

Sep. 2023 – Dec. 2023

Durham, NC

- Researched dielectric response of polymer nanocomposite systems as a function of dispersion
- Implemented physics-based computational models in COMSOL and data science methods to generate data sets for machine learning methods
- Optimized existing MATLAB machine learning scripts for 2D application

Undergraduate Teaching Assistant

Duke University - Computational Methods in Engineering

Aug. 2023 – Dec. 2023

Durham, NC

- Individually assisted students with Python assignments during lab and office hours 8 hours/week
- Graded weekly labs and provided personal feedback

Mechanical Engineering Intern

Stantec

Jun. 2023 – Aug. 2023

Lexington, KY

- Drafted hydraulic profiles for FGD wastewater treatment plants on Plant 3D
- Annotated piping isometrics by cross-referencing P&IDs on Bluebeam Revu
- Compiled plant equipment lists and data sheets for company-wide use using AutoCAD and Excel

Student Desk Assistant

Duke University Libraries

Aug. 2021 – May 2024

Durham, NC

- Assisted patrons with finding material and general information at front desk 8 hours/week
- Assess and troubleshoot computer problems brought by students and faculty
- Scanned and shelved books back into circulation

Engineering Camp Counselor

Newton's Attic

Jan. 2021 – Mar. 2021

Lexington, KY

- Engaged in hands-on technical work to construct portable restrooms for isolated communities in rural Kentucky
- Refined skills in wood/metalworking, welding, and tooling
- Independently welded platform frame of portable restroom structure

PROJECTS

- Koda Robotic Bear** | *Fusion 360, Raspberry Pi, Linux* Jan. 2024 – May 2024
- Individually designed an organic-looking robotic quadruped driven by Jansen linkages
 - Wrote Python script to execute walking and dancing locomotion
 - Animated linkage joint movement and context renderings of robot through native Fusion 360 software
- Maglev** | *LabVIEW* Oct. 2023 – Dec. 2023
- Designed PID controller capable of levitating a ferrous ball within a magnetic levitation apparatus
 - Demonstrated controller adaptability and robustness with constant, sine, square, and random inputs
- Cantilever Beam Bending and Deflection** | *Solidworks, Machine Tooling, TIG Welding* Sep. 2023 – Oct. 2023
- Designed a weight-optimized cantilever beam to deflect 1 inch according to variable applied load
 - Performed bending stress and factor of safety calculations to meet performance specifications
 - Performed FEA in Solidworks to identify and reinforce regions of high stress concentrations
- Pickleball Paddle Coach** | *Solidworks, Arduino, Soldering* Sep. 2023 – Oct. 2023
- Prototyped real-time feedback device for beginner pickleball players
 - Integrated Arduino, load cells, and amplifiers into 3D printed frame and housing
 - Developed user interface indicating contact points according to load cell force distribution
- TicTacToe Board** | *Solidworks, CNC Milling* Aug. 2023 – Sep. 2023
- Drafted assembly and technical drawings of a multi-component tic-tac-toe board in SolidWorks
 - Fabricated entire assembly using a CNC milling machine on 6061 Aluminum according to technical drawings
- FGD Wastewater Treatment Plants** | *Plant 3D, Bluebeam Revu* Jun. 2023 – Aug. 2023
- Drafted hydraulic profiles of tanks and equipment to use in deliverable package for client
 - Concurrently marked up plant piping isometrics for accuracy
 - Conducted a site visit for P&ID review meeting with client and data collection
- Route Finder** | *Java, Git* Nov. 2022 – Dec. 2022
- Implemented a routing service to model the United States highway network
 - Visualized shortest route via real-time simulation from user input
 - Used Java to store a graph representation and implement Depth First Search algorithm
- Amphibious Crawler** | *SolidWorks, Arduino, Microcontrollers, C++* Aug. 2022 – Dec. 2022
- Designed an amphibious crawler capable of discriminating and retrieving visually identical objects of (non)ferrous properties
 - Implemented and manually waterproofed motor drivers connected to Arduino to control speed and direction of motors via external joysticks
 - Collaborated with team members to integrate inductive sensors and retrieval apparatus
- Super Mario Bros Happy Meal Toy** | *SolidWorks, Cricut* Mar. 2022 – Apr. 2022
- 3D designed Happy Meal toy to advertise and promote upcoming *Super Mario Bros* Movie
 - Performed tolerance analysis for multi-component mystery box assembly and designed aesthetic stickers in Cricut
 - Pitched product to department faculty by delivering a poster presentation
- Sand Mousetrap Car** | *Power Equipment* Feb. 2022 – Mar. 2022
- Prototyped low-fidelity vehicle powered by a single mousetrap to traverse sand terrain
 - Built upon numerous iterations in rapid prototyping to maximize distance traveled
- Archery II** | *SolidWorks, Laser Cutting, Welding* Aug. 2021 – Dec. 2021
- Prototyped archery device for local organization *Bridge II Sports* that allowed disabled individuals with use of only one arm to mount and shoot a bow and arrow independently
 - Developed rapid prototyping skills and delegated tasks to team members
 - Delivered an oral presentation concluding our data and design process to department professors and fellow peers

TECHNICAL SKILLS

Modeling: AutoCAD, Plant 3D, SolidWorks, Fusion 360, Revit, BIM 360
Electronics: Raspeberry Pi, Arduino, Soldering, Microcontrollers
Fabrication: Power Equipment, Machining, Woodworking, MIG/TIG Welding
Languages: Python, Java, C++

ACTIVITIES

This Engineering Life Podcast <i>Junior Editor</i>	Aug. 2024 – Present
Brownstone <i>President</i>	Jan. 2023 – May 2024
Duke University Theta Tau <i>VP Technology</i>	Jun. 2022 – May 2024
Duke Men’s Club Volleyball <i>Libero</i>	Aug. 2021 – Present
Lakewood Elementary School Tutor	Sep. 2023 – Dec. 2023