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Zaid Ashai

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EDUCATION

M.S. in Robotics (GPA = 3.73)   **University of Michigan, Ann Arbor**   **September 2017 – December 2018**
- <u>Programming Coursework</u>: Data Structures, Machine Learning, Foundations of Artificial Intelligence (AI)
- <u>Robotics Coursework</u>: Intermediate Kinematics, Nonlinear Systems & Control, Autonomous Vehicle Dynamics

B.S. in Biomedical Engineering   **The Johns Hopkins University**   **September 2013 – May 2016**
- <u>Robotics Coursework:</u> Robot Kinematics & Dynamics, Mechatronics, Computer Integrated Surgery I/II

WORK EXPERIENCE

Robotics Specialist   **Allied Power & Control**   **June 2023 - Present**
- Programmed and integrated a UR5e robotic arm for machine tending in high-volume precision manufacturing

Software Engineer   **iRobot**   **February 2019 - February 2023**
- Used C++ to implement path planning, navigation, exploration, and localization software for mobile robots
- Led development of the cleaning strategy for the Roomba i3, which used only a mouse sensor to navigate, reducing costs by 50% compared to the flagship Roomba i7 and achieving similar mission completion rates
- Brought flagship digital features like directed room clean to the Roomba i3 by developing motion-based SLAM

Graduate Student Instructor   **University of Michigan, Ann Arbor**   **January 2018 - December 2018**

PROJECT EXPERIENCE

Autonomous vehicle using Simultaneous Localization & Mapping (SLAM), Kalman filter, and A* path planning   **2017**
- Used C/C++ to program a Raspberry Pi in Linux to interface between LiDAR, IMU, and servomotors

Autonomous single-axle self-balancing robot using a PID controller and inertial measurement unit (IMU)   **2017**
- Used C to program a BeagleBone board in Linux with OptiTrack data for real-time path planning, allowing the robot to drive in a 1m x 1m square, race down a 10m track in 8s, and autonomously navigate an obstacle course

Six DOF robotic arm to autonomously manipulate blocks into color-ordered formations using Computer Vision   **2017**
- Computed forward/inverse kinematics, programmed motion in Python, and parsed block locations from Kinect

Autonomous holonomic maze-running robot using a robotic arm and Computer Vision to retrieve a hidden object   **2016**
- Used C to program a Raspberry Pi in Linux with ultrasound sensors, servomotors, and an RGB camera

Five degree-of-freedom (DOF) robotic arm (UR5) to draw a geometric pattern on a whiteboard with a marker   **2016**
- Computed forward/inverse kinematics, programmed motion in Matlab, and tested in simulation using VREP

RESEARCH EXPERIENCE

Robotics Engineer, Intern   **Bipedal Robotics Lab**   **September 2018 – December 2018**
Simulate Nonlinear Controllers on the Bipedal Robot known as Cassie
- Utilized ROS 2 to interface between Matlab and Gazebo to test nonlinear controllers on a simulated model robot

Software Engineer, Intern   **Infinite Biomedical Technologies**   **June 2015 – August 2016**
Develop a Prosthetic Hand Assessment Method (PHAM) to Evaluate Prosthetic Hand Motions of Amputees
- Used Python program a GUI, used SolidWorks to design and build prototypes, and tested on two amputee subjects
Measure Compensatory Shoulder Movements in Upper Limb Amputees with Myoelectric Prostheses
- Used Python to analyze IMU data from two amputees' prostheses, comparing motions to six able-bodied subjects'

Mechanical Engineer, Intern   **Computational Sensing & Robotics Lab**   **September 2015 – May 2016**
Redesign the Tremor-Reducing Robotic ENT Microsurgery System (REMS) for Vein Anastomosis
- Used SolidWorks to design a robot-compatible needle holder, and conducted pilot study on ten medical students

SKILLS

Software: <u>advanced</u>: C++, Java, Unix, Git | <u>intermediate</u>: Python, Matlab, Arduino, Gazebo, ROS 2, JSON, SQL