David Alex

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EDUCATION

Worcester Polytechnic Institute | Worcester, MA **May 2025**
Bachelor of Science in Robotics Engineering

- Relevant Coursework: Industrial Robotics, Robotic Navigation, Robotic Manipulation, Embedded Computing in Engineering Design, Control Engineering.
- Research: YOLO Vision, Voice Commands, & End Effector Manipulation on a 3D-Printed Humanoid Robot advised by Pradeep Radhakrishnan and Taylor Andrews
- Club: Captain of the WPI Valorant E-sports Team

TECHNICAL SKILLS

Languages: Python , MATLAB, RAPID, C, C++, Java, Racket
Tools: UR5E Industrial Robot, SolidWorks, CoppeliaSim, RobotStudio, ROS, ROS2, Linux, GitHub, Fusion 360, VSCode

PROJECTS

End Effector Manipulation on a 3D-Printed Humanoid Robot:
Simulation Researcher **September 2024 – May 2025**

- Simulated the humanoid robot using CoppeliaSim, tested trajectory planning, inverse kinematics, and library implementations.
- Implemented the IKPY python library to compute inverse and forward kinematics, this uses a URDF to describe the robots geometries and joint positions.
- Created Human-Robot interaction using object detection, face meshing, and speech recognition using OpenAI.
- Completed contactless temperature checks using an IR thermometer and Inverse kinematics.

Sorting Balls by Color with Serial 4-DOF Arm:
Developer **September 2023 – October 2023**

- Implemented Forward Kinematics, Inverse Kinematics, Trajectory Planning, Computer Vision, and Image Processing. Applied these topics to make a 4-DOF Arm complete a ball sorting pick and place task.
- Used MATLAB to control the robot and perform image processing.

Industrial Robotics Coursework:
Developer **March 2025 – May 2025**

- Operated a UR5e collaborative robot using the teach pendant to program and execute motion paths, perform pick-and-place tasks, and test workspace limits
- Developed and simulated robotic work cells using ABB IRB 1600 (serial) and IRB 360 FlexPicker (parallel) robots for a case packing and palletizing system
- Implemented object detection, smart components, conveyor logic, and coordinate frames to simulate dynamic object handling and multi-robot collaboration.
- Optimized pick-and-place operations for real-world manufacturing environment sand motion programming (RAPID) to achieve precision manipulation and synchronization