Alexis Cruz-Ayala

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LinkedIn | Hackster.io | GitHub

EDUCATION

Duke University | Durham, NC | Graduation Expected in May 2025

- Majors: Electrical and Computer Engineering (B.S.E.), Computer Science (B.S)
- Minors: Machine Learning and Artificial Intelligence, Music
- Questbridge National College Match Recipient | Gates Scholarship Recipient
- **Relevant coursework**: Algorithmic Design, Operating Systems, Software Design & Implementation, Computer Systems/Architecture, Data Structures & Algorithms, Linear Algebra,

SKILLS

Software Development: Model-Based Systems Engineering, API-First Development, SCRUM/AGILE, Unit Testing
Hardware: Raspberry Pi, Arduino, Jetson Nano, Intel Realsense Cameras**,** FPGA, Verilog, Teensy, KiCAD
Platforms: Linux, GitHub, Gitlab,
Languages: Spanish, ASL
Programming: Java, C++, Python, C, MATLAB, x86 Assembly, Rust Lang, Ruby, Node.js, JavaScript, Go, Simulink
Machine Learning: TensorFlow, Pytorch, Sklearn, Keras, OpenCV, Theano
Communication: Technical Reports, Documentation, Presentations

WORK EXPERIENCE

FIU Human Cyber-Physical Systems Lab | U.S. DOE | Robotics Engineer Intern Miami, FL | May 2022 – Aug 2022

- Derived and simulated an updated admittance control algorithm using MATLAB and Simulink for an exoskeleton used in nuclear waste management
- Implemented the admittance control into a raspberry pi in C++ to operate Maxon motors through a CAN-bus, and integrated all I2C sensors to record human-computer interaction
- Designed and built a fundamental exoskeleton system (operating in 1 DOF) for investigating future control algorithms and studying human-computer response using the simplest model possible. The setup is still in use today

Picasso Intelligence LLC | Research Assistant Raleigh, NC | Oct 2022 – Apr 2023

- Developed and programmed a bipedal humanoid robot, with advanced walking and self-balancing capabilities
- Designed a PCB board in KiCAD tailored for the robot, featuring versatile ports to accommodate various peripheral devices
- Collaborated with the team to implement efficient algorithms and motor controls, leveraging URDF and ROS C++ for simulation and development
- The PCB board created has been used in various other projects and has found great success at other laboratories

Duke Robotics | Robotics and Embedded Systems Researcher Durham, NC | Dec 2021 – Jun 2022

- Designed a drone cyber-physical system meant for trajectory planning, with the intent that it would be used to study autonomous vehicles' susceptibility to different cyber-security attacks
- Programmed a simple deep reinforcement learning algorithm using TensorFlow, running on an Nvidia Jetson with an Intel Realsense D435 camera
- Documented and properly maintained Python code using Agile software development
- Both the code and drone have been used as frameworks for future projects in the laboratory since its inception

Matrix Labs | Systems Software Developer Miami, FL | Jun 2019 – Aug 2019

- Created and documented an accessible API for using ESP32 capabilities on the company's own development boards
- Built projects and made tutorials on Hackster.io using the Matrix devices with the above API, thus fostering community engagement and greater sales
- Made tutorials on how to use the onboard FPGA of the Matrix Creator, as well as live-streams teaching others how to get started with rudimentary Verilog and digital systems development

ORGANIZATIONS

Alpha Phi Omega **Sergeant at Arms | 2022 – Present**
Society of Hispanic Professional Engineers **Vice-President | 2021 – Present**
Diversity++ (Colorstack@Duke) **President | 2022 – Present**
FIRST Robotics Competition **Team Captain | 2017 – 2021**