

# Miguel A. Cabrera

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## SUMMARY OF QUALIFICATIONS

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Recent graduate with a combined background in mechanical and software engineering, specialized in robotics, and proficient in technologies like CAD, Python, and Docker. Demonstrated hands-on experience and strong academic foundation, eager to contribute to innovative robotics solutions in an entry-level role.

## EDUCATION

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### Florida International University

Masters in Computer Science

Miami, Florida

January 2022 - December 2023

### Florida International University

Bachelor of Science in Mechanical Engineering, Honors College

Miami, Florida

August 2018 - December 2021

- **Honors:** Cum Laude (GPA: 3.52/4.00)
- **Concentration:** Mechatronics

## SKILLS

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- **CAD Design:** NX, SolidWorks, Fusion360
- **Simulation:** ANSYS Workbench, OpenFOAM
- **Data Visualization:** MATLAB, Scipy, Matplotlib
- **Embedded Systems:** Arduino, Raspberry Pi, Navio2
- **Relevant Robot Technologies:** ROS/ROS2, Gazebo
- **Computer Vision:** OpenCV, YOLOv8
- **Programming Language:** Python, C++, JavaScript (React), Java, R,  $\text{\LaTeX}$
- **Spoken Language:** Native English Proficiency, Native Spanish Proficiency, Conversational Portuguese Proficiency
- **Manufacturing:** 3D Printing, Circuit Design
- **Operating System:** Linux, Windows, Mac
- **Development Tools:** Git, Docker

## WORK EXPERIENCE

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### MoRA Lab

Graduate Research Assistant

Miami, Florida

May 2022 - November 2023

- Developing a bio-logging suction cup device for small cetaceans. Involves the use of modeling on SolidWorks, performing computer fluid dynamic simulations on OpenFoam, and implementing validation techniques.

### Cutting Edge AI

Software Engineering Intern

Miami, Florida

June 2023 - November 2023

- Designed and integrated a state-of-the-art lightweight multi-stream YOLO-based object detection system capable of handling multiple RTSP streams simultaneously with high precision. Uses ByteTrack to maintain consistent object IDs across video frames, enhancing detection robustness and tracking continuity.
- Trained and optimized custom computer vision models as per the requirements of the marketing lead, ensuring tailored demonstrations to potential clients that highlighted the solution's capabilities and versatility.
- Implemented real-time data logging and transmission using Kafka to stream YOLO object detection inferences, optimizing data flow to a specialized data manipulation architecture.
- Utilized rclone for efficient screenshot management, ensuring seamless data integration with cloud storage solutions.
- Developed within a Dockerized environment using Visual Studio Code, streamlining build and deploy cycles for a more consistent and reliable development workflow.

## **BOSCH Florida Heat Pump**

CAD Engineering Intern

Fort Lauderdale, Florida

February 2023 - May 2023

- Utilized NX to address Engineering Change Requests which consisted of updating parts and generating precise drawings for legacy AC units.
- Facilitated the release of supplier drawings and collaborated in creating and maintaining the BOM for new product launches.
- Worked cross-functionally to ensure accurate product information dissemination to stakeholders, strengthening supply chain collaborations.

## **Math Lab @ FIU**

Learning Assistant for College Algebra, Pre-Calculus, and Calculus 1

Miami, Florida

August 2019 - April 2022

- Worked with a high influx of 70-100 students at any given time at the Math Lab, where students would work on their homework and study for their exams
- Facilitated individual and group (of 15-20) work to help students better develop core concepts

## **PROJECTS**

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### **Personal Portfolio Website**

Design and development of a responsive web application to showcase my professional background, achievements, and projects.

- Developed using React.js framework with React-Bootstrap for a responsive design, ensuring compatibility across various devices and screen sizes.
- Utilized modern JavaScript ES6+ features and React hooks for efficient state management and rendering.
- Deployed and maintained the website ensuring uptime and regular content updates.

### **Object Locator Using GPS Input**

Development of a device that is able to locate and track objects using only GPS input.

- Ability to work with both hardware and software components to develop innovative solutions
- Strong problem-solving skills, as demonstrated by the development of a functional prototype within a tight deadline

### **Development of a Solar Powered Pesticide Spraying Robot**

Design and development of a prototype for a remote controlled solar powered pesticide spraying robot intended to reduce human exposure to pesticides and extreme weather conditions.

- Used a mechanical design process to develop multiple iterations to improve performance and efficiency
- Modeled CAD drawings on SolidWorks, utilized rapid prototyping services, and assisted with the manufacturing process

### **Collaborative Dexterous Manipulation**

Worked with an industrial robot, UR3, to accomplish the goal of gripping on to a ball and sorting it by color. This was done by implementing ROS nodes to help the depth camera communicate with the robot arm.

- Used OpenCV library to pinpoint the centroids of the balls