

# Alexander Ibarra

San Antonio, TX

-Email me on Indeed: <http://www.indeed.com/r/Alexander-Ibarra/ce7d9abe05aac8b5>

## Work Experience

---

### Teaching Assistant

University of Texas at San Antonio

August 2020 to Present

- TA Instructor of the following courses: Intro to Robotics, Microcomputers I/II, Digital Systems Design
- Assist with the development of assignments, grading work and debugging student programs in C++, Python and Verilog.

Projects Search and Rescue Vehicle Recognition using OpenCV (Python, ROS)]

- Prototyped a custom recognition system for vehicles that are out of service in noisy environments using YOLOv3

AI Tracks at Sea – Boat Tracking and Path Prediction with OpenCV (Python, Docker)

- Predicted maritime contact tracking using YOLOv3 to predict bounding boxes around ships using dimension cluster. ([https://github.com/asibarr2/boat\\_detection\\_yolo](https://github.com/asibarr2/boat_detection_yolo))
- Applied custom image configurations to facilitate machine learning for enhanced vision

Autonomous SLAM Vehicle for Path Planning and Localization (Python, ROS)

- Constructed a map of an unknown environment while simultaneously keeping track of an agent's location within it.
- The UGV avoided obstacles using Lidar compatible with an odometry module, in which the data received from both sensors were merged to adapt Hector Slam for mapping purposes.

(<https://github.com/asibarr2/Jeep-URDF-Package>)

Unity Robot Swarm Simulation (C++, Python, ROS)

- Assisted with developing a centralized robotic swarm of turtlebot robots in Unity using ROS#.
- Fuzzy logic control was implemented, and a genetic algorithm was used to optimize the hyperparameters ([https://github.com/conorw8/unity\\_controller.git](https://github.com/conorw8/unity_controller.git))

(210) 275-9496

asibarra98@gmail.com

Alexander Ibarra

Differential Drive Simulation Using Gazebo (Python, ROS)

- Developed a differential drive system in Gazebo that could avoid obstacles using the Monte Carlo Localization Algorithm. ([https://github.com/asibarr2/gazebo\\_jeep](https://github.com/asibarr2/gazebo_jeep))

Automated Renewable Energy Vehicle (C++)

- Managed a team of four to implement a robust design process cycle to build a solar powered car able to recognize traffic light signals.

- Implemented safety standards for vehicle design and risk assessment

- Developed a Gantt chart to manage multiple priorities for project completion

Salvation Army (SA) San Antonio Web Application (Django, HTML, CSS, Bootstrap)

- SA holds events that require large numbers of volunteers to be tracked as well as kept in contact for future events.

- As project lead, I led students to develop the volunteers involved developing a web application using HTML/CSS, Bootstrap, and Django for managing volunteers at events hosted by SA.

(<https://github.com/epicsSalvationArmyVolunteer/salvation-website>)

Donkey Car Road Recognition and Navigation Using Tensorflow (Python)

- Prototyped path recognition algorithm using images extracted from a video.
- Extracted frames from videos and converted frames into tensors for training path recognition.

IEEE Region 5 Robotics Competition (Python)

- Under my leadership as a former President, a team was formed to design and build a robot to autonomously navigate an obstacle field and identify letters on blocks.
- Development for vision was conducted using OpenCV via harr cascades and deep learning techniques.

## **Research Assistant**

Autonomous Controls and Engineering Lab

August 2017 to Present

- Proficiency with collaborative robots for implementation of large-scale autonomous systems
- Integrated production equipment performing operations such as installing motor controllers, configuring sensors via ROS, and editing network communication protocols

## **Systems Integration Engineer Intern**

Work Plus One Robotics

February 2020 to May 2020

- Conceptualized and tested pilot/production of industrial robots (Motoman, Fanuc) through manipulator programming
- Produced safety standard documentation for manipulator design and risk assessment
- Evaluated new technologies to enhance capabilities such as implementation of Lidar, Barcode Readers, Point Clouds, and more

## **Embedded Systems Engineer Intern**

Southwest Research Institute

May 2019 to August 2019

- Development of Linux kernels through dependency setup
- Configuration of ARM platforms for industrial purposes using MPLAB X IDE
- Evaluated custom schematics for debugging and qualification of newly designed ICs

Conference System of Systems Engineering (SoSE) - Anchorage, AK

2019, pp. 242-247, doi:

10.1109/SYSOSE.2019.8753850.

## **Education**

---

### **Masters of Science in Electrical Engineering**

The University of Texas - San Antonio, TX

March 2022

### **Bachelors of Science in Electrical Engineering**

The University of Texas - San Antonio, TX

May 2020

## Skills

---

- Cameras
- Barcode Scanners
- Motion Control
- Wiring Components
- Electrical Schematics
- Mechanical Drawings
- Spare Parts
- Actuators
- Component Evaluation
- Sourcing