SAI MANIKANTA BADIGA

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SUMMARY

An aspiring graduate student pursuing Master's degree in Robotics at Arizona State University and having done an ample number of projects in the field of mobile robotics. Seeking full-time opportunity starting this summer 2024 in the role of design and developer.
Areas of Interest: Software Development, ML, RL, Path Planning, Robotics, Computer Vision, Autonomous Vehicles

EDUCATION

M.S Robotics and Autonomous Systems Apr 2024
Arizona State University, Tempe, AZ GPA-3.5/4

Relevant Coursework: Human Robot collaboration, Artificial Intelligence, Perception in Robotics, Multi-Robot Systems, Embedded Machine Learning.

Bachelor of Technology in Electronics and Communication Engineering, Major Robotics Mar 2022
K L Deemed to Be University, India GPA-8.66/10
Relevant Coursework: Introduction to Robotics, Advance Robotics

TECHNICAL SKILLS

Tools, Frameworks, and OS: Mission Planner, ArduPilot, MATLAB, ROS, RTOS, FUSION360, NI Vision Builder, KiCad, OpenCV, Raspberry Pi, Docker, Linux, LabVIEW Real-Time, Microsoft suite.
Programming: LabVIEW, Python, C, C++, HTML, CSS, JavaScript, SQL, C#
Certifications: National Instruments Certified LabVIEW Developer (CLD), National Instruments Certified Associate LabVIEW Developer (CLAD)
[As part of obtaining my CLD certification, I developed simulation environments for **HVAC**, **ATM,** and **vending machine** using **State Machine Architecture**. Additionally, I constructed a **Car simulation environment** utilizing the same State Machine Architecture.]

PROFESSIONAL EXPERIENCE

Hylio Inc, USA | R&D Engineer Intern: May 2023-Aug 2023

- **Software Tool Development**: Developed a comprehensive software tool for managing over **2,000 parameters** across **multiple drone models**, streamlining engineering **workflows** and improving **drone performance**.
- **Ground Control Station (GCS) Optimization**: Resolved **critical** issues in the **Ground Control Station**, including **custom command functionality**, resulting in more efficient production processes and **safer**, more **reliable** drone flights.
- **Swarm Functionality Testing**: Conducted **rigorous testing** for new **swarm functionalities** in the GCS, ensuring seamless management of **multiple** UAVs in **large-scale** operations.
- **Drone Firmware and Path Planning**: Worked on **drone firmware** to enhance the path planning algorithm using the **Dijkstra Path-Planner**, achieving a **95%** optimization rate, and significantly **improving** drone **navigation** in complex **terrains**.

Magnum Wings, INDIA | Intern: May 2020-Jun 2020

- Enhancing UAV software for **forest monitoring**.
- Programmed the drone for specific **maneuvers** and **data** collection.
- Collaborated with engineers to **troubleshoot** and **debug Pixhawk**-related issues.
- Gained hands-on experience with **ArduPilot configuration** for Pixhawk.
- Strengthened **teamwork**, **communication**, and **problem-solving skills** while working on real-world UAV applications.

PROJECTS

Self-Driving Car Simulation: Aug 2023

- Spearheaded a **self-driving car** simulation project using JavaScript with a **no-library approach**. This led to the development of a **realistic autonomous driving** experience with comprehensive car **driving mechanics**, defined environmental variables, and simulated **sensor functionalities**.
- Implemented **collision detection algorithms** and utilized **Neural Networks** to enable **autonomous decision**-making and car control within the simulation.
- This was achieved using **Genetic Algorithms** with **mutation techniques** to optimize **neural network** performance, significantly improving the simulation's **adaptability** and **efficiency**.

Self-navigating Unmanned Aerial Vehicles

- Equipped with YOLO technology for **object recognition**, estimation of **human body poses**, detection and **tracking** of faces, and **monitoring** of objects' movements.
- Capable of **avoiding collisions**, tracking items, and charting paths in both two and three dimensions.
- Features **hand gesture**-based controls for specialized functions.

Visual Tracking Unmanned Vehicle - Mambo Drone Arizona, USA
EGR 598 - Robotics Systems II (Course Project) Jan 2023 - Apr 2023

- Developed a high-performance**, low-level flight control algorithm** with integrated **Kalman Filter** for autonomous navigation of the Mambo Drone.
- Successfully integrated an **advanced image processing module** for various capabilities in a real-world Mambo drone.

CLIPort: What and Where Pathways for Robotic Manipulation:
CSE 598-Perception in Robots (Course Project)

- Implemented **safe constraints** within the robotic manipulation **pathways** to avoid **hazardous** areas.
- Enhanced system safety by identifying and **mitigating risk** factors in **real-time**.
- Contributed to the development and **fine-tuning** of **algorithms** that improved the overall reliability and safety of robotic operations.

Autonomous Mobile Robot [AMR]:
Center of Fabrication (FAB) | Research Student: Worked as team of 2 members, on Autonomous Mobile Robot May2018-Mar2021

- Engineered cost-efficient last-mile delivery robot solution for a university campus using **RTOS** to perform repeated tasks within a **tight time boundary**.
- Programmed and analyzed objects using **LabVIEW** and **NI vision** assistant, including **real-time object detection** and **object tracking**.
- Developed **2D path planning** algorithms incorporating **APF**, **motion planning**, **waypoints**, **IMU** feedback, and **odometry**.

Awarded for solving problem statement on pick and place with **AMR**:
Accomplished **first-place** wins in **state** and **regional AMR competitions** by **AP State Skill Development Corporation and National Skill Development Corporation** in 2018. Achieved **runner-up** status **nationally in 2018** and **clinched** another **state-level victory in 2021**.

ACTIVITIES

National Instruments Center of Excellence, Technical Club, at KL University Aug 2018 – May 2019

- Conducted **tutoring sessions** for **10-15 undergraduate engineering** students weekly, focusing on **LabVIEW** programming, **LabVIEW FPGA**, and **LabVIEW Real-Time** device interfacing.
- Provided **guidance and assistance** to students in resolving issues related to their projects and assignments.