SIDDHARTH JAIN

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EDUCATION

ARIZONA STATE UNIVERSITY — Tempe, AZ
Master of Science, Robotics and Autonomous Systems — May 2024
Relevant Coursework: Reinforcement Learning, Deep Learning, Multi-Robot Systems, Optimal Control — GPA: 3.78/4.0

D. J. Sanghvi College of Engineering — Mumbai, IN
Bachelor of Engineering, Mechanical — May 2022

WORK EXPERIENCE

ENTERPRISE TECHNOLOGY — Tempe, AZ
ML Ops and AI Development Engineer — Aug 2023 – Present

- Led the development and integration of a proprietary Language Learning Model (LLM) with a robotic head, achieving 98.5% accuracy in real-time face detection; optimized machine learning for 97% voice recognition accuracy.
- The system leverages NVIDIA Jetson, resulting in a 50% processing speed boost, with a precise tracking latency of under 10ms.

Embedded Systems Engineer — Oct 2022 – Jul 2023

- Implemented real-time UHF mesh protocol with AES encryption using C++, LoRa, MQTT, and AWS IoT for cart tracking, while enabling BLE mesh network with ESP32/React-Native, boosting emergency response efficiency by 20%.
- Devised AWS Lambda functions with Python, API Gateways, and Timestream, increasing data retrieval by 30%.
- Optimized mpu9250 for deep sleep acceleration-based interrupt in IoT-based cart tracker, extending battery life to 3 years.

BIO-INSPIRED ROBOTICS, TECHNOLOGY AND HEALTHCARE LAB — Tempe, AZ
Graduate Student Researcher — Dec 2022 – Present

- Introduced a 6-axis load cell with a real time closed-loop controller in Linux using Python, enhancing precision by 15%.
- Fabricated curved textured surfaces with Polydimethylsiloxane (PDMS) polymer, facilitating friction-based mobility.

DJS KRONOS INDIA — Mumbai, IN
Vice Captain — Mar 2019 – May 2021

- Employed Simulink for vehicle simulation, enhancing efficiency by 17%. Integrated GSM SIM 900 Module and Raspberry Pi Zero, transmitting sensor data via ThingSpeak Communication Library, refining data acquisition.

ACADEMIC PROJECTS

DEXTEROUS MANIPULATION WITH A ROBOTIC HAND | Reinforcement Learning, Actor Critic, Python, Linux

- Examined on-policy and Monte-Carlo methods, achieving 20% success enhancement with Advantage Weighted Actor Critic.
- Harmonized offline/online tuning to refine a 6 DoF robotic hand using reinforcement learning in Linux.

SELF BALANCING PLATFORM | MATLAB, Simulink, Inverse Kinematics, PID Controller

- Constructed a closed-loop PID controller for Stewart platform using Simulink, stabilizing ball motion. Minimized Steady State Error through integral tuning, improving responsiveness to 0.5 seconds, and demonstrated control principles.

UAV LINE FOLLOWER DRONE | MATLAB, Simulink, Edge Detection

- Innovated a Line Follower function for the Parrot Mambo Mini-Drone, identifying specific HSV values within 20 ms, culminating in 95% accuracy.

DYNAMIC PATH FINDING IN COMPLEX ENVIRONMENT | Python, C++, Algorithm Design, Dynamic Programming

- Developed and compared advanced pathfinding algorithms (A*, Dijkstra's, DFS, BFS) using Python. Adapted them to real-world scenarios with moving obstacles, achieving path lengths of 24-25 steps and times ranging from 0.0011 to 3.288 seconds.

CUSTOM LoRa AND ETHERNET COMMUNICATION BOARD | ESP32 S3, PCB Design, FreeRTOS, Embedded C

- Designed a 4-layer PCB with Xtensa LX7, RFM95W LoRa, and LAN8720 Ethernet, integrating 50-ohm impedance control for RF integrity. Utilized C and FreeRTOS for concurrent tasks and power management, enhancing efficiency and reliability.

TECHNICAL SKILLS

Languages	Python, C++, C, MATLAB, SQL, PowerShell
Software & Tools	Docker, ROS2, Gazebo, Solidworks, Arduino IDE, Altium, MS Office
Frameworks & Cloud Services	Tensorflow, PyTorch, React Native, FreeRTOS, AWS (IoT Core, Lambda, DynamoDB)
Hardware & Protocols	Raspberry Pi, PCB Design, Semtech SX12xx, NRF BLE, CAN Bus, ZigBee, LoRa, MQTT, Ethernet