SIDDHARTH JAIN

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EDUCATION

Arizona State University — Tempe, AZ
Master of Science, Robotics and Autonomous Systems - Thesis — May 2024
Focus: Embedded Systems, Reinforcement Learning, Deep Learning, Multi-Robot Systems, Optimal Control

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

TECHNICAL SKILLS

Languages	Python, C++, Embedded C, MATLAB, SQL, Bash, Terraform
Software	Docker, ROS2, Gazebo, Rviz, Solidworks, Arduino IDE, Altium Designer, Jira, CI/CD
Frameworks	PyTorch, FreeRTOS, FastAPI, OpenCV, Tesseract OCR, OpenGL, Tensorflow
Hardware	Raspberry Pi, SX12xx, NVIDIA Jetson, ESP32, Atmega 328, ARM Cortex-M
Protocol	NRF BLE, CAN Bus, ZigBee, LoRa, MQTT, Ethernet, Wi-Fi, SPI, I2C, LoRaWAN, UART, TCP, UDP,
AWS	IoT Core, Lambda, Sagemaker, OpenSearch, DynamoDB, S3, EC2, API Gateway

WORK EXPERIENCE

Enterprise Technology — Oct 2022 - Present
Embedded Systems Engineer — Tempe, AZ

- **Implemented AES-128 Encryption** to enhance security of custom **UHF mesh** networks using **MQTT** on an edge device.
- Engineered a **BLE LoRa mesh** network on **ESP32 for SOS** alerts, significantly **improving emergency response** efficiency.
- **Optimized** the **MPU9250 sensor** in IoT trackers, **extending battery life** to 1 year by enabling deep sleep mode..

ML Ops and AI Development Engineer — Tempe, AZ

- Engineered a **Model as a Service** framework by setting up **proxy http servers** for various 3 backend services and 8 LLMs.
- **Optimized data retrieval** and scalability using AWS **OpenSearch**, **DynamoDB**, and various Vector DBs by 38%.
- Created scalable **LLMs on AWS Lambda** (x86 CPU), enhancing enterprise **AI platform efficiency** and cost-effectiveness.

SKM Steels Limited — May 2021 - May 2022
Systems Automation Engineer — Mumbai, IN

- Improved an automated quality control system using **Allen Bradley PLC**, achieving a **30% reduction in defect** rates.
- Customized an **automated material handling** system integrated with a 6 axis **UR-16e Robotic Arm**.
- Proposed and deployed **PLC ladder logic (Siemens)** leading to a **15% improvement** in overall system performance

DJS Kronos India — Mar 2019 - May 2021
Vice Captain — Mumbai, IN

- Led the design of a 4WD ATV on **Simulink**, achieving a **17% increase in operational efficiency**. 2nd Best 4WD Team.
- Built a **DAQ system** using the GSM SIM 900 Module on a **Raspberry Pi Zero** via ThingSpeak Communication.
- Used **Peltier modules** to convert **exhaust heat to electricity (0.6A)** with step-up circuits, enhancing **battery recharging**.

PROJECTS

Dexterous Manipulation with a Robotic Hand | Reinforcement Learning, Actor Critic, Python, ROS

- Advantage Weighted Actor Critic algorithm to enhance the performance of a 6-DoF robotic hand.
- Achieving up to a 20% improvement in dexterous manipulation success rates.

Multi Robot Search & Rescue | ROS2, RTAB, OpenCV

- Developed a decentralized quadcopter swarm with Potential-Field and Frontier Exploration algorithms for 3D mapping.
- Enhanced efficiency with a leader-trooper strategy (1:3), navigating through terrains and avoiding local minima.
- Performed Gazebo simulations, validating the swarm's ability to produce detailed 100x100 grid maps..

Custom LoRa & Ethernet Communication Board | ESP32 S3, PCB Design, FreeRTOS, Embedded C

- Designed a 4-layer PCB with ESP32 S3, focusing on LoRa and Ethernet integration using FreeRTOS, using dual core.
- Employed Xtensa LX7, RFM95W LoRa, and LAN8720 Ethernet, integrating 50-ohm impedance control for RF integrity.

PATENTS

- Steering Knuckle Joint - Patent No. 378832-001: 4WD ATVs design using r-zeppa joint and steering for better linkages.
- Single Stage Open Differential - Patent No. 378831-001: Mechanism for smoother turns and efficient power distribution.