SIDDHARTH JAIN

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SUMMARY

Driven by a profound passion for robotics and AI, I am determined to leverage my comprehensive expertise in autonomous systems, ML, and embedded development to make impactful contributions to forward-thinking enterprises.

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

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), FastAPI
Hardware & Protocols	Raspberry Pi, PCB Design, Semtech SX12xx, NRF BLE, CAN Bus, ZigBee, LoRa, MQTT, Ethernet

WORK EXPERIENCE

ENTERPRISE TECHNOLOGY   Tempe, AZ
ML Ops and AI Development Engineer   Aug 2023 – Present
- Pioneered the development of a custom Llama endpoint for our Language Learning Model (LLM) and integrated it with a TTS endpoint for personalized voice capabilities. This innovative system boasts a 98.5% accuracy in real-time face detection.
- Engineered the entire system to run on a Raspberry Pi, ensuring a compact and wireless design. The platform also features celebrity match-making and an advanced image generation tool (DALLE-3) inside a wireless robot head.

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
- Developed a novel 3-axis testing setup equipped with a 6-axis load cell to automate and accurately measure the frictional characteristics of a PDMS pad on both rusted and non-rusted curved surfaces. Utilized a PID controller to ensure precise normal loading forces.
- Conducting 180 experiments in a controlled environment for the thesis, focusing on evaluating the frictional behaviors of the pads.

DJS KRONOS INDIA   Mumbai, IN
Vice Captain   Mar 2019 – May 2021
- Spearheaded the development and optimization of an all-terrain electric vehicle using Simulink, resulting in a 17% boost in efficiency.
- Seamlessly integrated the GSM SIM 900 Module with Raspberry Pi Zero, enabling real-time transmission of sensor data via the ThingSpeak Communication Library, which significantly enhanced the accuracy and speed of 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.

MoM (MINUTES OF MEETING) BOT | Speaker Diarization, vLLM, Streaming LLM, Whisper, TTS
- Developed a Minutes of Meeting Bot that seamlessly records, diarizes, and transcribes meetings using Whisper, then queries a custom Llama endpoint with VLLM, streaming LLM, and RoPe for context-rich responses within 3.5 seconds.

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.

CO-CURRICULAR ACTIVITIES

- Part of the Robotics and Autonomous Systems club wherein we conducted various seminars and workshops.
- Mentoring the DJS Kronos India Team with their goal to achieve a self driving autonomous electric all-terrain vehicle.