Siddharth Jain

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EDUCATION

Arizona State University, Tempe, USA **Expected May 2024**
Master of Science, Robotics and Autonomous Systems *GPA: **3.78/4***
Relevant Coursework: *Reinforcement Learning, Deep Learning, Optimal Control, Multi-Robot Systems*

D. J. Sanghvi College of Engineering, Mumbai, India **May 2022**
Bachelor of Engineering, Mechanical *GPA: **8.74/10***
Relevant Coursework: *Structured Programming Approach, Industrial Electronics, Robotics, Machine Design*

TECHNICAL SKILLS

Languages	Python, C++, Embedded C, MATLAB & Simulink, SQL, PowerShell
Software	Docker, ROS2, Gazebo, Solidworks, Linux, Arduino IDE, Altium, Microsoft Office
Frameworks	Tensorflow, Scikit-Learn, PyTorch, React Native, FreeRTOS
Cloud Services	AWS IoT Core, Lambda, Timestream, DynamoDB, S3 Buckets
Hardware	Semtech SX12xx, NRF BLE, ESP32, SAMD21, Arm Cortex-M, ATmega, Raspberry Pi
Protocols	SPI, I2C, CAN Bus, UART, ZigBee, LoRa, Wi-Fi, BLE, MQTT

WORK EXPERIENCE

Embedded Systems Engineer **Oct 2022 – Present**
Enterprise Technology *Tempe, AZ*

- Engineered a self-sustained proprietary UHF off-grid full mesh protocol with AES Encryption for ASU cart tracking. Leveraged expertise in embedded C++, telemetry with protocols like LoRa, MQTT, and AWS IoT Core integration.
- Developed a Bluetooth Low Energy mesh network on ESP32, for SOS signals with React-Native for both Android and iOS.
- Authored AWS Lambda functions, complemented with API Gateways and Timestream, for real-time location data capture, showcasing embedded system-cloud interoperability using python and javascript.
- Optimized mpu9250 with deep sleep acceleration-based interrupt, extending battery life to 3 years for the IoT-based cart tracker.

Graduate Student Researcher **Dec 2022 – Present**
Bio-Inspired Robotics, Technology and Healthcare Lab *Tempe, AZ*

- Engineered an advanced 3-axis linear cartesian robot, integrating a 6-axis load cell with a closed-loop controller. Developed primarily in python for embedded Linux environments, ensuring high precision testing results.
- Designed and fabricated gripper pads with curved textured surfaces using a Polydimethylsiloxane (PDMS) polymer to enable the LTI robot to perform friction-based mobility on curved surfaces irrespective of the material and surface texture.

Vice Captain **Mar 2019 – May 2021**
DJS Kronos India *Mumbai, India*

- Headed and co-founded the electric ATV team, also simulated the vehicle using Simulink, achieving a 17% increased efficiency.
- Engineered a DAQ system using GSM SIM 900 Module with Raspberry Pi Zero, transmitting sensor data efficiently through the ThingSpeak Communication Library, emphasizing cloud interoperability and embedded C++ proficiency.

ACADEMIC PROJECTS

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

- Analyzed on-policy methods like DAPG, Monte-Carlo return methods such as AWR, leading to a 20% increase in success with the Advantage Weighted Actor Critic for dexterous robotic manipulation by merging prior offline data with online tuning.
- Employed reinforcement learning and Python within a Linux environment, optimizing robotic skill acquisition.

Self Balancing Platform | *MATLAB & Simulink, Inverse Kinematics, PID Tuning*

- Engineered a closed-loop PID controller for the Stewart platform's linear actuators, optimizing linkage positions for ball motion stability, and significantly reduced the Steady State Error through integral value adjustments.
- Leveraged Simulink for control system design, showcasing expertise in real-time control and ensuring system stability.

UAV Line Follower Drone | *MATLAB, Simulink, Edge Detection*

- Developed a Line Follower function for the Parrot Mambo Mini-Drone, employing edge detection techniques to calculate the nearest edge and identifying specific HSV values of the track using MATLAB and Simulink. Deployed to the drone via Bluetooth.

Machine Learning for Fraud Detection | *Python, TensorFlow, LSTM, Deep Learning, RNN, CUDA*

- Conducted an exhaustive analysis of machine learning algorithms for bank transaction fraud detection, employing preprocessing strategies like one-hot encoding and SMOTE in Python.
- Carried out feature importance assessment and statistical evaluations to validate the significance of model performance variations.

PATENTS

Steering Knuckle Joint for Double A-arm Suspension System | *378832-001*

- Designed a steering knuckle joint for a four-wheel-drive all-terrain vehicle, linking suspension arms, steering tie rod, and wheel assembly, incorporating an active r-zeppa joint, with shocks on the upper A-arm and an integrated steering arm.