Sidharth Sarat Raj Batchu

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EDUCATION:

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Masters in Science in Robotics and Autonomous Systems

Arizona State University, Tempe, AZ, USA — Aug 2022 to May 2024

B.Tech. in Electrical and Electronics Engineering with specialization in Power Electronics

K L Deemed University, India — July 2014 to May 2018

EXPERIENCE

Operations Engineer II - AMZL Startup Execution

Amazon — Nov 2024 - Present

- Led cross-functional engineering initiatives to design and implement optimal automation systems, saving **$2M per annum in OpEx**.
- Developed project-level solutions involving equipment specification, process flow, facility layout, and control strategies, **ensuring scalability**, safety, and IP considerations.
- Collaborated with internal stakeholders and external vendors to **recover $450K from installation defects**.
- Demonstrated technical leadership in achieving **100% reduction** in equipment jams by engaging senior leadership and stakeholders **to resolve network-wide** installation planning and control logic challenges.
- Designed **AI solutions** using state-machine algorithms **to assist troubleshoot real-time automation** errors and install hurdles on-site, reducing up to **24 hours/project** by driving **150+ customer adaption**.

Software Controls Engineer - Central Lasers Facility

Tata Institute of Fundamental Research — Mar 2020 - Feb 2022

- Developed automated controls software for laser systems, sensor data logging, and PLC interlocks, **reducing manual engineering effort by 12+ hours per cycle**.
- Engineered cross-platform device drivers (Linux/Windows) for scientific equipment, **achieving 40% reduction in round-trip latency.**
- Designed and deployed a **microsecond-precision clock synchronization system**, resolving facility-wide timing inconsistencies.
- Built digital twins of hardware systems and implemented hardware-in-the-loop (HIL) testing, **to improve debugging efficiency and system reliability.**

Iot Engineer - Wearable Tech

Null Iot — July 2019 - Nov 2019

- Designed a low cost **($20/unit) wearable device for patient vitals monitoring and tracking** using ESP8266 and ATtiny85, optimized for scalable in house manufacturing.
- Developed embedded C software for real-time health data processing, addressing latency and resource constraints on low power hardware.

R & D Engineer - Agri Tech

Fopple Technologies May 2018 - October 2019

- **Owned end to end development** of scalable manufacturing systems, driving **82% cost reduction** ($28 to $5) and enabling efficient large scale product deployment.
- Architected a sensor-driven automation platform integrating real-time data analytics and event-triggered workflows, **to improve crop yield by 12%** and **reducing resource utilization by 42%**.
- Developed a **versatile sensor data acquisitio**n platform using ATmega328P microcontroller with round robin scheduling, **designed for cross-functional adaptability** across diverse business applications.
- Engineered thermal management solutions temperature monitoring systems for heavy payload drone battery packs and ESCs to **provide 45% extended flight time**.

PROJECTS

Survey on Accelerators Systems for Multi DNN on Edge and IOT **On-going**

- Conducting comprehensive survey on state-of-the-art hardware accelerators and optimization techniques for multi-DNN inference on low-power edge/IoT devices.
- Implementing ML accelerator designs on FPGA platforms (Altera, AMD Kria KR260), validating research methodologies using Verilog.
- Developing Ring Oscillator Physically Unclonable Functions (RO-PUFs) on FPGA to establish trusted execution environments for secure edge computing.

Deployable Single board based Inventory Manager **May 2022 - July 2022**

- Built custom lightweight Linux images using Yocto Project, minimizing attack surface by stripping non-essential packages and libraries.
- Developed embedded C application layer with local SQL database for offline-capable inventory management on single-board hardware.

PUBLISHED RESEARCH

- **Current Methods of De-Icing and Designing an Autonomous Robot for De-Icing**
  DOI:10.14419/ijet.v7i1.8.16398

  Designed crawler mechanism with vibrating arms to automate ice removal on 500KV transmission lines, reducing downtime and manual intervention.

- **UV Sterilizing Dustbin** **DOI:10.46501/IJMTST0708011**
- **IoT Based Sanitary Pad Vending Machine** **DOI:10.46501/IJMTST0711013**

CERTIFICATIONS & AWARDS

- Innovation by Design - Certification
- Digital Manufacturing & Design- Certification
- Economic Times Campus Star Award- Brightest Engineer Minds of India, 2018.