SurajKumar Kadiyam Balaji

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Education

Masters in Electrical and Computer Engineering [Concentration: *Microsystems, Materials and Devices*]

Northeastern University, Boston | GPA : 4.0 **Expected May 2026**

Bachelors in Electrical and Electronics Engineering

Anna University, Chennai | GPA : 3.6 **Aug 2018 – May 2022**

Technical Skills

- **Programming Languages:** *Embedded C, C, C++, Python*, *Verilog, SystemVerilog, MATLAB*
- **Tools:** *Cadence Design Suite, HFSS, LTSpice, BRISC V, Microchip Studio, dinero IV*
- **ASIC Design and Verification***: Knowledge of ASIC implementation and GPU pipelines*
- **Testing & Debugging***: LDRA Testsuite-TBRUN, TBVISION*
- **Communication Protocols and Concepts:** *CAN, SPI, I2C, RF/Analog Design, Microwave Theory*
- **Frameworks & Verification Methodologies:** *Tensorflow, Pytorch, Hands on experience with UVM, debugging*
- **SoC Architecture:** *Understanding of components like CPU, GPU, DSP, interconnects, memory controllers*

Experience

Skilled Graduate Engineer **Jan 2023 - June 2024**

Tata Technologies, Pune

- **Developed a gas leakage detection system** interfaced with **CAN communication** for compressed natural gas vehicles, working with Tata Motors on **hardware design** and **software integration**
- **Led electromagnetic compatibility (EMC) testing** and analysis for **intelligent battery management systems (BMS)**, ensuring robust performance in **high-noise environments**
- **Designed and optimized analog front-end circuits** for gas detection systems, integrating **transceivers** with **CAN communication** for **real-time monitoring**
- Managed multiple **embedded system projects**, applying knowledge of **system design**, **hardware-software integration**, and **automotive electronics**

Embedded Engineer Intern

Skill-Lync E-learning Company, Chennai **July 2022 – Dec 2022**

- **Developed embedded systems** using **Embedded C** and **AVR bare metal programming**
- **Simulated** and **analyzed analog and RF circuits** using **MATLAB and Cadence,** focusing on **noise figure and impedance matching**
- **Designed** and **implemented printed circuit boards (PCBs) for embedded systems,** incorporating **RF matching networks**
- Worked on **SoC architecture concepts**, gaining hands-on experience with **CPUs, GPUs, interconnects, and memory controllers** to optimize system-level performance

Academic Projects

Benchmarking and Performance Analysis of x86 and Apple ARM Architectures **Sep 2024 – Dec 2024**

Verilog, SystemVerilog, C++, Python, Geekbench, Cinebench, AIDA64

- Developed a **benchmarking framework** to analyse **x86(CISC)** and **ARM(RISC)** processors
- Evaluated **cache performance, pipeline efficiency, branch prediction** and **thermal behaviour**
- Designed **custom codes** for workload simulations and **architectural testing**
- Conducted **GPU pipeline validation** with **real-world compute intensive applications**

Next Generation Hybrid Energy Storage System **Sep 2024 – Dec 2024**

Python, MATLAB, Advanced Material Simulation

- Designed a **hybrid energy storage system** combining solid-state batteries with **silicon anodes** and **super capacitors**
- Enhanced **energy density** and **rapid discharge** capabilities for application in **EVs** and **grid storage**
- Modelled and **simulated energy storage mechanisms** and power delivery using advanced material properties

Smart Wearable for Pulmonary Fibrosis **Jan 2022 – May 2022**

Machine Learning, IoT, Embedded C

- Created a wearable to monitor patient data with live updates for doctors
- Integrated **machine learning** for predictive analysis
- **Developed a web app** for real-time doctor-patient interaction

Achievements

- Presented a paper at the IEEE-certified International Conference on Power, Energy, Control, and Transmission Systems (Dec 2022) and received a Certificate of Appreciation from the INSC Institute of Scholars
- Strong foundation in RF/microwave theory, antenna, filter, analog, and mixed-signal design (ADC/DAC, PLLs, amplifiers). Proficient in high-speed system simulation, debugging, optimization, and driven by innovation and problem-solving