Chandrashekhar Choudhary

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SUMMARY

Embedded systems engineer with 7+ years of experience in microcontroller programming, hardware-software integration, real-time systems design, and cross-functional collaboration. PhD candidate specializing in sensor development, low-power system optimization, and PCB design. Proven track record of delivering battery-efficient wireless sensor systems, optimizing embedded firmware, and integrating multiple communication protocols.

EDUCATION

Ph.D in Electrical Engineering (Sensor and System Design Track) *Jun. 2026*
University of Cincinnati (UC), Cincinnati, Ohio *GPA: 4.0/4.0*

Master of Technology (Electronics System Design) *July. 2018*
International Institute of Information Technology - Bangalore (IIIT Bangalore), Bangalore, India *GPA: 3.7/4.0*

EMBEDDED SYSTEMS EXPERIENCE

Smart Helmet System for Traumatic Brain Injury (TBI) Detection ***Present***

- Engineered wireless sensor system integrating **15+** sensors (accelerometer, gyroscope, piezoelectric) with a microcontroller for impact monitoring.
- Designed flexible PCBs optimized for space constraints and implemented event-driven firmware with interrupt-based wake modes.
- Achieved **>5 days** battery life on **100 mAh** coin cell through aggressive power management strategies.

Real-Time Particle Exposure Protection System *2022-24*

- Created firmware for a portable embedded monitoring system integrating **6+** environmental and particulate sensors.
- Optimized system for size reduction **(>80% smaller)** while maintaining performance and battery life.
- Implemented adaptive algorithms to compensate for moisture condensation in sensor readings.
- Developed and integrated hardware and software solutions for reliable real-time data processing.

Battery-Powered Wireless Sensor Network *2021-22*

- Architected low-power wireless network for continuous monitoring using acoustic and novel calorimetric sensors.
- Developed audio signal processing algorithms on MCU to enhance detection and classification of acoustic events.
- Applied real-time digital filtering, feature extraction, and event recognition techniques to improve system accuracy.
- Programmed embedded devices for data acquisition and optimized wireless transmission to preserve battery life.
- Validated through **30-day** field testing in real-world environments.

Projector Control via Raspberry Pi (Device Driver Development) *Spring'21*

- Developed a custom Linux device driver to automate projector power control based on HDMI connection events.
- Utilized mailbox interface communication with Raspberry Pi VideoCore to retrieve EDID data and distinguish projectors from monitors.
- Enabled seamless on/off switching of projectors, enhancing device integration for embedded systems applications.

WORK EXPERIENCE

Cisco Systems **Bangalore, India**
Software Engineer – G8(3) *Aug. 2018 – Dec. 2020*

- Led development across Cisco's enterprise switching software stack, focusing on programmability, automation, and internal platform tooling used by **50M+** devices globally.
- Delivered **15+** features across **6** releases on IOS-XE software powering **50M+** switches and routers
- Led cross-functional effort to build an internal automated testing platform → reduced org-wide inefficiencies by **97%**
- Resolved **50+** escalated customer issues through deep diagnostics and stable patch delivery
- Built engineer utilization model adopted org-wide → boosted labor productivity by **25%**

Software Engineer Intern *Jan. 2018 – June 2018*

- Developed RF profiling application for client fingerprinting before onboarding onto wireless networks
- Integrated security solution with Cisco routers to enhance network security

Software Engineer Intern *May. 2017 – July 2017*

- Created web-based dashboard to analyze and visualize customer bug data across Cisco components
- Enabled data-driven decision making for addressing high-bug components

Ingersoll Rand **Bangalore, India**
Hardware Intern *Jan. 2016 – June 2016*

- Developed hardware simulator and firmware to emulate sensor signals for testing ThermoKing SR4 controller boards

Schnieder Electric **Bangalore, India**
Hardware Intern *Jun. 2015 – July 2015*

- Created multi-protocol gateway using Raspberry Pi for building automation applications (Modbus/BACnet).

SKILLS

- **Embedded Systems:** FreeRTOS, GDB, Buildroot, Linux device drivers, Firmware development, RTOS concepts, Baremetal programming, QT, PyQT5
- **Hardware:** ARM Architecture, Silicon Labs, Raspberry Pi, Intel Edison, Arduino, Microcontrollers, ADC, DAC, Op-Amps, boost/buck converters, Multiplexers, Semiconductor devices, System/Board Design, Board bring up, Power budgeting, Hardware automation
- **PCB Design:** Eagle, Flexible PCB design and assembly
- **Communication Protocols:** Zigbee, BLE, I2C, SPI, UART, RS-485, Modbus, BACnet
- **Programming & Scripting:** C, C++, Python, shell, assembly, Valgrind, VHDL, Verilog, MAGIC
- **Tools & Equipment:** Oscilloscope, Function generator, DMM, Logic analyzer
- **Simulation & Modeling:** COMSOL Multiphysics, MATLAB, NI Multisim, Solidworks