

Work Experience

Research Lead	WINGS Lab	Sep 2023–Present
Chip-less RFID development team	University at Buffalo, Buffalo	
<ul style="list-style-type: none">Designed and developed an SDR-based Chip-less RFID reader using USRPs X310 and B210, resulting in a 40% increase in tag reading accuracy and efficiency, with the potential for a 500% increase in encoding capacity.Developed an Out-of-Tree block in GNU Radio with embedded Python for dynamic center frequency adjustment at the interrogator, demonstrating initiative and self-taught skills in Python and linux while improving system accuracy and efficiencyLed four progress report and presentation sessions with sponsors and beneficiaries, ensuring effective communication and alignment throughout the project lifecycle.		
Research Assistant	WINGS Lab	May 2023–Aug 2023
Chip-less RFID development team	Chennai, India	
<ul style="list-style-type: none">Improved tag performance by 50% through careful selection of optimal thermal transfer printed tag design from over 200 different design combinations.Designed and built a makeshift anechoic chamber using cardboard and sponges to achieve a 40% reduction in interference, improving data accuracy and reliability through resourcefulness and thorough testing.Optimized designs through simulation using CST Studio Suite, resulting in improved performance and reduced cost of physical prototyping.Investigated the relationship between design constraints and thickness of aluminum-based ink using electron microscopy, contributing to the development of optimized tag design.		
Project Intern	SLN Technologies	2018
	Chennai, India	
<ul style="list-style-type: none">Developed solar-powered smart street lighting system with multiple sensors, utilizing C programming, Arduino and Raspberry Pi. Collaborated as core team member responsible for sensor interfacing and dashboard monitoring on ThingSpeak. Demonstrated proficiency in IoT, sensor interfacing, and hardware programming.		

Projects

- Conducted **MATLAB simulations** to implement and analyze digital modulation schemes, such as **PAM, QAM, and PSK**, and compare their Bit Error Rate (BER) and Symbol Error Rate (SER) curves for optimum receiver detection. Utilized **Jake's Fading Simulator** to implement Multiple-Input Multiple-Output (MIMO) wireless systems, and evaluated system performance by analyzing SER vs Signal-to-Noise Ratio (SNR) curves, demonstrating proficiency in simulation tools and wireless communication systems..
- 3-section Microstrip Directional Coupler using ADS** - Designed a 22 dB parallel line 3-section coupler with specific design constraints, including a coupling of 20 dB, directivity of 17 dB, and insertion loss of 1.5 dB at the design frequency. By meeting these specifications, the coupler improved signal transmission, resulting in increased signal strength, precise signal distribution, reduced interference, and minimized signal loss, ultimately improving circuit performance and increasing productivity.
- Fingerprint Image Restoration and Classification - Fingerprint Image Restoration and Classification** - Improved gender classification accuracy from 50% to 95% for blurry fingerprint images using CNN and TensorFlow Keras. Demonstrated effectiveness of image processing techniques with potential impact on biometric security. Developed skills in deep learning, image processing, and Python.
- mm-Wave Massive MIMO software radio** - As a team member, played a key role in the development of M3, contributing to the implementation and communication establishment of the software radio using GNU Radio and

shell scripting. Demonstrated proficiency in software-defined radio and wireless communication technologies, and played an essential role in advancing the project's potential for enabling call transmission through multiple arrays of phased arrays, with significant implications for future wireless systems and network efficiency.

- Implemented **hardware and software for CC2650 Launchpad**, including data acquisition using embedded C and **interfacing with LoRa and Sigfox LPWAN technologies**, showcasing proficiency in on-chip communication protocols such as SPI, I2C, and UART. Collected and processed sensor data locally and sent it to the cloud, with significant implications for IoT and wireless sensor network applications.
- Implemented AquAware, an **IoT solution for water quality assessment** using an array of sensors integrated with an Arduino board and LORAWAN device, transmitting near-time data to the cloud for processing and analysis. Resulted in improved water quality management by predicting future trends and triggering notifications for necessary remediation actions

Education and Certifications

- **M.S. Electrical Engineering, SUNY University at Buffalo, Buffalo.** Jan 2022–May 2023
- **B.Tech Electronics and Communication Engineering, SRM University, Chennai, India** 2016–2020

Skills

- Languages: MATLAB, C, C++, Python, Verilog, SQL
- Design Tools: Advance Design Systems (ADS), CST Microwave Studio, GNU Toolchain, Linux, TINA, STM32CubeIDE, Arduino IDE, Android Studio, Code Composer Studio
- Hardware: Microprocessors (8085, Raspberry Pi), Microcontrollers (Arduino, Texas Instruments Launchpad CC2650, PIC, 8051), STM32F407 Discovery Kit (Arm Cortex M4)

Additional Work experience, Awards and Involvement

- Tutored over 100 secondary and higher secondary students in Sciences over the span of six years, showcasing excellent communication and soft skills.
- Captained National level field hockey team which was awarded 2nd position at All-India hockey meet and secured 2nd position at pin-level rifle shooting competition, demonstrating leadership and athletic ability.
- Volunteered in one of the world's largest distribution of sanitary pads among underprivileged organized by Blooming Beacon NGO, demonstrating social responsibility and community involvement.