

EDUCATION

UNIVERSITY OF MICHIGAN ANN ARBOR

MI, USA

MASTER OF SCIENCE EECS: NETWORK, COMMUNICATION, AND INFORMATION SYSTEMS | GPA 4.11/4.0

AUG 2022 – APR 2024

Coursework: Communication Networks, Probability Theory, Wireless Systems, RT Embedded Systems

NATIONAL INSTITUTE OF TECHNOLOGY HAMIRPUR

HAMIRPUR, IN

BACHELOR OF TECHNOLOGY: ELECTRONICS AND COMMUNICATION ENGINEERING | GPA: 9.49/10 (3.957/4)

AUG 2015 - MAY 2019

ENGINEERING SKILLS

- **Programming Languages:** C/C++, MATLAB, Python.
- **Subject Knowledge:** Radio Frequency, Firmware, LTE, NR, V2X, RT Embedded Systems, Cellular Protocols.
- **Machine Learning:** Reinforcement Learning, Qnets, CNN, PyTorch, AI-assisted Engineering.

WORK EXPERIENCE

QUALCOMM

CA, USA

SENIOR ENGINEER, MODEM SW, FR1/FR2/FR3 TEAM

JUN 2024 – PRESENT

- Redesigned FR1/FR2 receiver algorithms for RF impairments including interference cancellation, residual sideband suppression, desense, and saturation; translated RF requirements into real-time firmware under tight processing and hardware constraints.
- Owned the downlink receiver processing path across a multi-core subsystem; optimized algorithms and firmware to reduce MIPS by up to **~10%**, enabling dynamic scheduling and advanced functionality while addressing concurrency and synchronization.
- Led execution-timeline and memory analysis for current and future modem architectures; developed ELF/DWARF-based tooling for code/data ownership, driving **~14% improvement in memory utilization** and informing processing and memory capacity.
- Developed AI-assisted workflows for trace analysis, source-code correlation, dependency analysis, and root-cause investigation; contributed to next-generation modem architecture studies, including fast-response AGC with **~9% improvement in high-fading conditions**.
- Developed a CNN-based model for frequency-independent IQ imbalance prediction and validated its feasibility for hardware integration, reducing reliance on specialized RF-front-end hardware.

MODEM SW INTERN, MMW TEAM

MAY 2023 – AUG 2023

- Re-designed an algorithm for Frequency Independent Side Band suppression which provides SNR improvements.
- Revamped the call-flows between co-procs to allow for faster convergence times, and less memory operations.

QUALCOMM INDIA

HYDERABAD, IN

RADIO FREQUENCY SW ENGINEER, MODEM AIR INTERFACES TEAM

JAN 2020 – AUG 2022

- Led LTE -V2X RFSW team for design, commercialization and support for the first DSDA+V2X Modem by Qualcomm.
- Developed RFSW solutions maintaining functionality of LTE, NR V2X as per the 3GPP spec (ex: ACLR, SEM, EVM).

SAMSUNG RESEARCH INSTITUTE NOIDA

NOIDA, IN

NETWORK ENGINEER, COMMUNICATION PROCESSOR SYSTEM R&D

JUNE 2019 – JAN 2020

- Troubleshoot Modem protocol procedures for support in Galaxy A Devices, delivering 3GPP compliant performance.
- Analyzing the protocol logs across RRC, MAC, debugged Handover and CSFB Scenarios to establish the root cause.

RESEARCH PROJECTS

REINFORCEMENT LEARNING FOR LLMS, University of Michigan

FEB 2024 - APRIL 2024

- Spearheaded a cutting-edge research project on Reinforcement Learning for Large Language Models (LLMs).
- Implemented Proximal Policy Optimization (PPO) and Natural Language Policy Optimization (NLPO) algorithms to align LLMs with human preferences in paper summarization tasks.
- Conducted extensive experimentation with beam search and temperature sampling techniques, resulting in significant improvements in reward acquisition and model alignment.

TCP IN MMW NETWORKS, University of Michigan

JAN 2023 – APR 2023

- Analyzed performance of conventional TCP protocols over mm-Wave networks.
- Proposed and implemented a new algorithm based on TCP Reno, Vegas in NS-3, more suited to wireless networks.

REDD (REAL-TIME EXPEDITED DISEASE DETECTION), **University of Michigan**

AUG 2023 – DEC 2023

- Developed a functional prototype for Real-Time segmentation of 13 lung diseases without reliance on internet.
- Quantized model weights of PSPNet by making architectural changes, significantly reducing model size (from 260MB to 0.55MB) which reduced memory usage on resource-constrained platforms like Raspberry Pi.
- Demonstrated capabilities of running a Real Time offline inference on Pi within 25s.

COGNITIVE RADIOS WITH 5G, **TU Vienna**

MAY 2018 – AUG 2018

- Developed an algorithm for Evaluation of Energy Detection for 5G Spectrum Sensing, Cognitive Radios.
- Enhanced the 5G simulator with Cognitive Radio and Spectrum Sensing capabilities, in a MATLAB environment.
- Succeeded in utilization of underused spectrum, without having an impact on 5G performance.