Rittwik Sood

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Education

Purdue University West Lafayette, Indiana
*MS in Electrical Engineering | GPA - **4.0**/4.0* *Jan 2024 – May 2026*
Relevant Coursework: Wireless Communication Networks, Advanced Digital Communication, Artificial Intelligence, Random Variables and Signals, Computer Communications, Convex Optimization

National Institute of Technology Hamirpur Hamirpur, India
*B.Tech in Electronics & Communication Engineering | GPA - **9.72**/10.0* *Aug 2014 – May 2018*

- The President of India Gold Medal (**Rank 1** in the institute)
- Director's Gold Medal for Best All Rounder Performer 2018

Technical Skills

Languages: C, C++, MATLAB, Python, Embedded C, SQL, Latex
Concepts: DSA, Wireless Systems, Cellular Communication, NR5G, Modem Systems, Satellite Communication
Developer Tools: Git, Docker, Visual Studio, JIRA, PyCharm, Eclipse, Qualcomm Tools
Frameworks & Libraries: NumPy, PyTorch, Matplotlib, Pandas, React, Perforce, Node.js, Jenkins

Work Experience

Eutelsat OneWeb McLean, Virginia
System Engineering Intern *May 2025 - Aug 2025*

- Architected next-gen NTN system design for a LEO satellite network, creating an in-house modem chip emulation environment that cut development cycles by 25% and accelerated prototype readiness by atleast 20%
- Designed 3GPP-compliant NTN architecture on 5G NR and implemented firmware and software stacks to emulate NXP LA1235 & LS1046 modem chips, enhancing simulation fidelity and reducing integration bottlenecks.
- Led cross-functional development of in-house software environment, accelerating time-to-market by 35%.

Qualcomm Inc. Hyderabad, India
Senior Software Engineer - Modem NR5G *Sep 2018 - Aug 2023*

- 5 years in Modem NR5G RF Software team. Primary task included analysing 3GPP spec documents, and programming HW RF components like Antennas, PAs, LNAs, ASMs.
- Worked on **Physical layer** programming of RF front end Digital and Analog components.
- Created critical features and their SW frameworks, like ENDC (LTE + 5G Dual Connectivity), NR Dual Connectivity (NRDC), MPE (Maximum Polarisation Exposure) on mmw.
- Worked with varoius OEMs on 25+ product lines. Assisted teams across geographies in USA, CHN and Israel in day-to-day critical activities and Modem Bring ups.
- Worked with cross-functional teams like Firmware, Hardware, MAC, System to design new features, test functionalities and enable data communication between various layers.
- NR Dual Connectivity framework, feature I worked upon extensively, was presented as a highlight (one of the five features) by Qualcomm CEO at the Mobile World Congress (MWC 2021), Barcelona. Download speed of 10 GBps was achieved for the first time.

Research Experience

Purdue University West Lafayette
Research Assistant *Jan 2024 - Aug 2025*

- Quantifying disparities in internet coverage (availability and speed, including uplink and downlink) across Midwest states by comparing FCC Broadband Data Collection (BDC) with the Ookla speed database and ISP-provided coverage data to reduce Digital Divide.
- Analyzed correlations between these coverage discrepancies and various demographic factors (such as income, education levels, urban/rural divide, and race) using ACS and U.S. Census Bureau data
- Developing a predictive model to estimate the state of the digital divide for 2025, identifying key deficiencies in internet access, based on demographic variables and extending its applicability to other U.S. states to assist in forecasting future digital divides and optimizing the allocation of digital resources.

IBT, Karlsruhe Institute of Technology (KIT) Karlsruhe, Germany

DAAD-WISE Scholar | Advisor: Prof. Olaf Dossel, Dr. Nicolas Pilia *May 2017 - Jul 2017*

- Instantaneous phase estimation and analysis of bio-signals including ECG and EEG signals to predict heart and brain disorders well in time [LINK].
- In a period of 3 months, formulated a novel method to predict heart and brain diseases timely, amalgamating benefits of conventional algorithms like Hilbert transform, STFT, Sinusoidal decomposition etc.
- Performed mathematical analysis and took a comparative study of the novel method against the conventional methods available using various well-known Signal Processing algorithms. A 16% of efficiency improvement was observed by the novel method.

Indian Institute of Technology Delhi Delhi, India

Indian Academy of Sciences Research Fellow | Advisor: Prof. Subrat Kar *May 2016 - Aug 2016*

- Tourist Assistance System for geo-locating and aiding tourists in remote areas without mobile communication. [LINK].
- Made a prototype with a bluetooth enabled system and a mobile app interface to evaluate the last available coordinates of the user and through data-analysis, find the most probable radius, where the user may be found.
- Awarded with 'The Best Intern Project' award in the internship.

Academic Projects

Sparse Channel Estimation for Massive MIMO with Compressed Sensing via Convex Optimization

- Investigated channel estimation through a compressed sensing framework, leveraging the natural sparsity of wireless propagation environments.
- Modeled the estimation task as an underdetermined inverse problem and analyzed various approaches to determine algorithm selection in realistic massive MIMO deployments

Analyzing Reliability in Molecular Communication

- Channelising Physical Layer characteristics of a diffusion medium by studying relationship between probability of error, with diffusion coefficient, distance between Tx and Rx and, number of bits in a symbol.
- Took molecules of different types to alter bits per symbol and changed diffusion coefficients. Added MAC encapsulations to reduce the probability of error establishing more reliable channel [LINK].

SISO and MIMO System Model Reduction using heuristic algorithms

- Applied various heuristic algorithms like Genetic Algorithm, PSO and Luus Jakola to reduce complexities of MIMO and SISO Models. [LINK].
- Devised a new method, Ensemble Framework for Optimized System (EFOS), resulting into a reduced system with better performance as compared to conventional techniques

Real Time Smart Honking System

- Created a prototype for a disincentive measure to control unnecessary honking on roads. Realised a system to produce a low beep sound in front treading vehicles in a span of 120°.
- Conducted a study on Delhi roads which found the system to reduce the effective noise pollution by 65%
- Integrated with traffic control system, permitting the emergency to reach the desired destination without wasting time in the traffic.
- Got awarded as Most Innovative Project HP 2016 from Himachal Pradesh Government and received funding to file patent [Patent].

Leadership and Awards

- Secured 2nd rank Nationwide at ADCOM ARM Design Contest 2015: Competed with 650+ teams from universities and industry across India. Got appreciation from the Governor of Himachal Pradesh [AWARD].
- DAAD-WISE Fellowship 2017: Given to top-100 meritorious students across India, accorded by the German government and EU to undertake research internship in Germany.
- Indian Academy of Sciences Research Fellowship 2016: Amongst Top 200 students to undertake research internship in premier institutes in India. Got selected at IIT Delhi (Only 4 applicants)
- SJVN Merit Scholarship 2014-2018: Accorded to 35 students who have topped in Senior Secondary examination. Received a full four-year scholarship for undergraduate studies.
- Student Representative: ECE Departmental Under-Graduate Committee (DUGC): Acted as a key liaison for the 2014 ECE batch, effectively mediating and resolving critical issues between students and the administration.
- Founder and First President, Innovative Research Incubation Club (IRIC), NIT Hamirpur: Launched and led the official incubation center of NIT Hamirpur, securing sponsorship from the Government of India and DST. Achieved funding for 3 projects from the Chief Minister Startup Fund within the first 6 months.