Manav P. Kohli

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Education

Columbia University	New York, NY, USA

M.S., MPhil, Ph.D. in Electrical Engineering, GPA 4.07/4.0 — Sep. 2018 – Sep. 2024
Advisor: Prof. Gil Zussman. Awards: NSF & NPSC Graduate Research Fellowships

Brown University	Providence, RI, USA

B.S. in Electrical Engineering, GPA 3.93/4.0, Magna Cum Laude — Sep. 2014 - May 2018

Relevant Coursework: *Microwave Circuits, mmWave IC Design, RF Measurements, DSP, Analysis of Algorithms, Digital Comms, Digital Logic Design, Computer Networks, Design of Computing Systems, Mathematics of Deep Learning*

Professional Experience

Apple	Sunnyvale, CA
Silicon Validation Engineer	Sep. 2024 – Present

— Developed comprehensive test plans to evaluate high-frequency RFIC TX and RX chain performance. Coverage includes linearity of individual chain components, modulated signal testing, and regulatory emissions compliance
— Applied skills in software engineering, firmware development, and baseband signal processing techniques to develop time-domain test flows, reducing test time by up to 10x, and improving test coverage accordingly
— Led cross-functional efforts to identify, diagnose, and triage issues found during test, minimizing system impacts

Google	Mountain View, CA (Remote)
Software Engineering Intern (XLS HW Synthesis)	Sep. 2021 – Dec. 2021

— Developed high-level synthesis (HLS) compiler optimizations in C++ to improve generation of hardware for-loops
— Implemented register synthesis to allow hardware reuse in for-loops, reducing ASIC area and power consumption

Nokia Bell Labs	Crawford Hill, NJ
Research Intern (Access Lab)	June 2019 – Aug. 2019

— Devised and conducted largest-of-its-kind measurement campaign in NYC to study the 28 GHz millimeter-wave 5G NR wireless channel. Collected tens of millions of data points for 1000's of wireless links in 4 urban environments
— Derived statistical models for 5G NR channel properties and link budget using measurement data in MATLAB

Ph.D. Research Projects

Full-Duplex Wireless: From Integrated Circuits to Networks (FlexICoN)

— Created a first-of-its-kind publicly accessible full-duplex (FD) wireless testbed. Built a custom RF front-end for use with software-defined radios, and developed custom signal processing and MAC algorithms in C/C++ and Python
— Demonstrated throughput gains up to 2x in real network scenarios with FD-capable base stations and users
— Developed channel estimation protocol to support automatic configuration of wideband IC-based FD hardware

Millimeter-Wave (mmW) Channel Measurements in collaboration with Nokia Bell Labs

— Conducted two uniquely large-scale measurement campaigns to study 28 GHz 5G NR wireless channel properties across 3 sq. km of diverse NYC urban environments. Operated & upgraded custom RF measurement hardware
— Developed statistical models in MATLAB and Python from ~100 million collected data points to quantify channel properties such as path loss. Applied models to predict 5G NR FR2 coverage for outdoors and indoors users
— Characterized degradation of real mmW link budgets caused by modern construction glass, scaffolding, and trees

Select Publications (For a full list of publications, please see https://wimnet.ee.columbia.edu/people/former-members/manav-kohli/)

M. Kohli, M. Baraani Dastjerdi, J. Zhou, et. al, "Design and Testbed Deployment of Frequency-Domain Equalization Full Duplex Radios" *IEEE Transactions on Wireless Communications,* vol. 24, no. 5, pp. 4377-4391, May 2025

M. Kohli, A. Adhikari, et. al, "Outdoor-to-Indoor 28 GHz Wireless Measurements in Manhattan: Path Loss, Environmental Effects, and 90% Coverage", *IEEE/ACM Transactions on Networking*, vol. 32, no. 3, pp. 2463-2478, June 2024

Skillset Summary

Hardware: ADS; Cadence Virtuoso; Verilog; RF Electronics; Embedded Systems; Firmware Development; PCB Design & Layout; **Networks:** PHY & MAC Protocols; 5G NR; 802.11 WLAN; TCP/IP; Multimedia Protocols. **Software:** C; C++; MATLAB; Python; SQL; scikit-learn; tcpdump/ping/traceroute; Cloud. **Test/Debug:** Test Automation; Network Analyzer; Spectrum Analyzer; Oscilloscope; PCB Rework; GDB. **AI Tools:** Claude Code; Agentic Workflows; Skill Definitions
Soft Skills: Cross-Functional Team Player; Experienced Researcher; Adaptable and Fast Learner; Detail-Oriented