Arav Sharma

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Education

BE in Electrical Engineering, The Cooper Union – New York, NY — Expected May 2025

- Minor in Computer Science; Specialization in Signal Processing
- Relevant Coursework: Microwave Engineering, Hardware Design, Comm Theory, Digital Signal Processing, VLSI

Experience

RF Embedded Systems Intern, Princeton Microwave Technology – Mercerville, NJ — May 2024 – Aug 2024

- Designed, simulated, and tested advanced microwave devices including oscillators, power amplifiers, and LNAs
- Independently engineered a wideband synthesizer module (900 MHz – 13 GHz) by integrating Analog Devices ADF series fractional-N PLL, custom loop filter, LDO regulators, EEPROM, microcontroller, and USB interface on a PCB
- Achieved ultra-low phase noise (-120 dBc/Hz at 10 kHz offset at 12.8 GHz) by optimizing loop filter parameters in ADIsimPLL and using impedance-controlled microstrip transmission lines and coplanar waveguides in Altium
- Automated noise figure measurements (Y-factor method) using MATLAB Simulink, spectrum analyzer, noise source, and RF switch, enabling continuous testing of LNA units during a 3-day recalibration period of lab equipment
- Implemented SPI and I2C protocols in embedded C to interface microcontroller with ADF PLL chip and EEPROM
- Developed a desktop GUI application in python for easy synthesizer configuration uploads by the user

IoT Engineering Intern, ECOLIBRIUM – New York, NY — May 2022 – Apr 2024

- Launched a HetNet (heterogeneous network) with Bluetooth, WiFi, LTE, and LoRaWAN (915 MHz)
- Deployed over 40 ESP32 remote sensing units programmed in embedded C with custom PCB and enclosure
- Implemented Raspberry Pi based edge gateways programmed using shell scripts, python, and MySQL
- Captured actionable data regarding urban heat islands and pioneered a framework for future smart city initiatives

Smart Ag Researcher, El Centro de Paz Barbara Ford – Quiche, Guatemala — Jul 2023 – Aug 2023

- "Automated Off-grid Irrigation for Food and Water Security in Guatemala" accepted IEEE GHTC Conference 2024

Digital Logic Design TA, The Cooper Union (On Campus) – New York, NY — Sept 2022 – Dec 2022

- Led workshops in lab equipment and assisted students in circuit design and coursework

Projects

- Microwave Wideband Synthesizer (900 MHz – 13 GHz): programmable module with ultra-low phase noise
- Delay-Locked Loop (1 GHz): behavioral/schematic/layout in Cadence using Verilog-AMS and TSMC 65 nm PDK
- RF Mixer (4 MHz): single-balanced NMOS mixer driven by differential crystal-controlled Colpitts oscillator

Skills

- **Analog Design:** Cadence, IC Design, Layout, TSMC PDK, Altium, Printed Circuit Board (PCB), SPICE
- **RF:** HFSS, ADS, ADIsimPLL, Filter Design, Noise Figure, Transmission Lines, S-Parameters, Impedance matching
- **Programming:** C/C++, Python, MATLAB, Shell, Linux, Perl, Tcl, Assembly, Firmware, Operating Systems
- **Hardware:** Xilinx FPGA, AMD Vivado, RTL coding, Mixed-signal IP, Verilog-AMS, ADC/DAC, SerDes, Digital Design
- **Lab Equipment:** Vector Network Analyzer (VNA), Spectrum Analyzer, Signal Generator, Oscilloscope
- **Microsoft Office:** Word, Excel, PowerPoint, Project

Leadership

- **MUDBUG**: founded club to develop smart agriculture sensing solutions, received Venturewell Pioneer Grant 2023
- **IEEE**: organize and attend talks/events to stay up to date on latest technology

Certifications/Licenses

- Qualcomm 5G Introductory Level Certification 2024
- FCC Amateur Radio Technician License 2024
- Cadence Virtuoso 5G mmWave RFIC Transceiver Certification 2024