

# ROHIT KUMAR

San Diego, CA 92122

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## Education

### University of California San Diego

*Master of Science in Electrical and Computer Engineering - Communication Theory and Systems*

2018 – 2020

San Diego, CA

### SRM Institute of Science and Technology

*Bachelor of Technology in Electronics and Communication Engineering*

2013 – 2017

Chennai, India

## Coursework

- |                                 |  |   |                                     |
|---------------------------------|--|---|-------------------------------------|
| • Modern Communication Networks | • Random Processes                         | Analysis                                | • Principles of Wireless Networks   |
| • Linear Algebra & Applications | • Communications Lab II                    | • Applications of DSP                   | • C++ III: Programming with Objects |
|                                 | • Python Programming for Algorithms & Data | • Machine Learning for Image Processing |                                     |
|                                 |  | • Information Theory                    |                                     |

## Experience

### 5G Cellular Systems Performance Analysis Engineer

07/2020 – Present

*Qualcomm Inc.*

San Diego, CA

- Evaluated/debugged downlink SCH/CCH KPIs on Keysight UXM+Propsim, Qualcomm TBS platforms.
- In depth knowledge of RRC IEs and bring up of bespoke tests for features across 3GPP protocol stack (TDD/FDD, FR1/FR2, NR-DC, SA/NSA, multi-CC) under various channel fading scenarios (AWGN, TDL-A/B/C, HST-SFN).
- Resolved modem demod/firmware issues with cross functional teams using log analysis and post-processing.
- Delivered first NRDC on 8RX CPE Performance test with Qualcomm Test Base Station, improving FR1 performance by 10%+ and test execution cost savings of 80%+.
- Skilled in IQ analysis, data visualization, test planning, automation using batch scripts, AWS Quicksight and Python.

### Summer Research Intern & Graduate Research Assistant

03/2019 – 06/2020

*University of California San Diego*

San Diego, CA

*Sub-band Full Duplex Radios (Upcoming 3GPP Rel18 feature)*

**Research advisor: Prof Dinesh Bharadia**

- Mobicom 2022- BSMA: Scalable LoRa Networks Using Full Duplex Gateways (DOI:10.1145/3495243.3560544)
- Increased reliability and throughput of LPWANs and IoT networks using a full-duplex (FD) PHY layer at the base station and FD enabled MAC layer.
- Developed a simulation framework for FD performance based on real data.
- Improved cancellation by 20 dB with 'successive' quantization method.
- Designed and developed cheap RF-PCB analog cancellation boards with 30dB cancellation.
- Designed a small dev PCB for UCSD's first low power 'Backscatter' communication IC (news-clip).

### Graduate Teaching Assistant

03/2020 – 06/2020

*University of California San Diego*

San Diego, CA

*ECE161C - Applications of Digital Signal Processing*

**Course instructor: Prof Fred Harris**

- Taught DSP applications in a modem, such as shaping and matched filters, PLLs, frequency and timing loops, OFDM/Single Carrier-OFDM.

## Projects

### WiFi OFDM Project | *Modern Communication Networks*

10/2018 - 12/2018

- Implemented OFDM receiver on MATLAB and achieved  $\approx 0.001$  BER with real world data.
- Implemented packet detection, channel estimation and CFO/SFO and Doppler shift compensation algorithms using preambles and pilots.

### Investigating Multi-Object Detection | *Machine Learning for Image Processing*

09/2019 - 12/2019

- Implemented YOLOv3 and CenterNet and achieved mAP of 0.67 and 0.8 respectively with PASCAL-VOC dataset.

## Technical Skills & Tools

**Skills:** 5G Modem System Testing, Python, C/C++, RF Testing, Test Automation, Research, Analysis, Algorithms

**Tools:** Keysight PRT, QXDM, APEX, MATLAB, PyTorch, Git, Altium Designer, Vector Signal Analyzer

## Leadership / Extracurricular

### Cognitive Radio System and ABU ROBOCON 2015, 2016

08/2014 – 03/2017

*SRM Institute of Science and Technology*

Chennai, India

- Cognitive Radio System - Adjudged best project by the ECE department.
- Fabricated wireless system with beam-steering and frequency hopping for secure communications.
- Built robots for ABU ROBOCON competition and reached national finals twice.