

# ROHIT KUMAR

San Diego, CA 92122 | *Authorized to work in the US (NIW)*

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## Education

### University of California San Diego

2018 – 2020

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

*San Diego, CA*

### SRM Institute of Science and Technology

2013 – 2017

*Bachelor of Technology in Electronics and Communication Engineering*

*Chennai, India*

## Coursework

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

## Experience

### Senior Engineer - 5G Modem Systems Performance

07/2020 – Present

*Qualcomm Inc.*

*San Diego, CA*

- Versatile cellular modem systems engineer with commercialized contributions across major modem areas - SA/NSA, FR1, FR2, NRDC, single-carrier/carrier-aggregation, PDCCH, PDSCH link adaptation.
- Contributed to the commercialization of cutting-edge 3GPP Rel-16/17 cellular modem features leveraging Machine Learning (ML) techniques.
- In depth knowledge of 3GPP spec and bring-up of bespoke feature validation scenarios using various TE vendor equipment (Keysight UXM - Propsim, Qualcomm Test Base Station (TBS)), channel fading (AWGN, TDL-A/B/C/D, HST-SFN) and MIMO configurations.
- Delivered first NRDC (FR1+FR2) performance test on Consumer Premises Equipment (femto-cell CPE) with Qualcomm TBS, improving FR1 performance by 10%+ and test execution cost savings of 80%+.
- Skilled in log, IQ analysis, data visualization, test planning, automation using MATLAB, Python, AWS Quicksight and Insight. Well placed to take advantage of ongoing AI transformation due to grad school coursework and projects.

### 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 MATLAB based simulation framework for FD performance based on real data and improved cancellation by 20 dB with 'successive' quantization method.
- Designed and developed cost-effective RF-PCB analog cancellation boards with 30dB cancellation and a testbed 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, 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 Systems, AI/ML, Gen AI, Python, C/C++, RF Testing, Automation, Research, Analysis, Algorithms

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