Sudhanshu Sharma

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EDUCATION

University of Southern California, *Master of Engineering in Electrical Engineering, Los Angeles* Aug 2021-May 2023
Grade: 4.00/4.00
Relevant Coursework: Advance Wireless Communication, Probability for Electrical and Computer Engineers

National Institute of Engineering, *Bachelor of Engineering in Electronics and Communication, India* Aug 2015-Jul 2019
Grade: 8.82/10
Relevant Coursework: Computer Networks, Digital Communication, Machine Learning, Digital Signal Processing, Simulation-Based Design of 5G Wireless Standards

SKILLS

- **Languages**: MATLAB, C, C++, Python, Verilog, RTL
- **Open-Source Software**: Git, Arduino IDE, Google Colab,
- **Technologies**: MIMO, mMIMO, OFDM, mm Wave, Digital Signal Processing, FMCW Radar, Wireless Communications, V2X, TensorFlow
- **Network Protocols**: 3GPP, 5GNR R15, 5GNR R17, OSI, TCP/IP.

EXPERIENCE

Wireless Devices and Systems Group (WiDeS), *Directed Research Assistant,* USC Oct 2021-Present
Under guidance of Prof. Andreas F. Molisch

- Enabling Joint Communications and Sensing in Cellular Vehicular Communications using Standards-Compliant Waveforms.

Indian Institute of Technology, *Senior Project Associate (Full-Time),* IIT-Kanpur Nov 2020-July 2021
Under guidance of Prof. Rohit Budhiraja (Indigenous 5G testbed)

- Initiated 5G NR PHY layer algorithm development for sub-6 and mm-wave systems acc. to 3GPP.
- Programmed end to end MATLAB chain for downlink shared channel (PDSCH).
- Constructed an algorithm for Channel estimation for OFDM system utilizing DMRS.
- Performed different equalization techniques by implementing MMSE, ZF for sub-6GHz systems.
- Demonstrated Channel estimation using SRS assuming Channel reciprocity.
- Created Multiuser scenario implemented for Data channel in 5G NR (PDSCH).

MMRFIC Technology Pvt. Ltd, *Digital Signal Processing System Engineer (Full-Time)*, Bengaluru Jul 2019-Oct 2020
Under guidance of Prof. Ganesan Thiagarajan

- GPS Rx (Beamforming) using MVDR – (Minimum Variance Distortion Less Response)
- Analysed Error-Correcting codes and Angle estimation with Cholesky decomposition.
- Fountain Code implementation and Fixed-point conversion.
- Handled broad bring-up NT1065 (RF Front-End IC for reception of Global Navigation Satellite System (GNSS) signals).

Robert Bosch Engineering and Business Solutions, *Calibration Engineer (Part-Time)*, Bengaluru Jan 2019-Jul 2019

- Lead group for calibrating 48v Hybrid System.
- Performed Diagnostic system management test and remote calibration of gasoline engine.

Mysuru Consulting Group, *Machine Learning Intern (Internship), Mysuru* Jun 2018-Jul 2018

- Created a program to digitize hand-drawn flowcharts using pre-trained TensorFlow models.

Holosuit, *Research and Development Engineer (Part-Time), Mysuru* Aug 2017-Jun 2018

- Created an algorithm to determine acceleration and distance needed to move a humanoid avatar.
- Handled hardware integration and Board Processing with BLE and Wi-Fi Unity/Unreal Plugin for UDP connection.

Asarva Chips & Technologies Pvt Ltd, *Digital Design Engineer (Intern), Bengaluru* Jun 2017-Jul 2017

- Designed and implemented a 16x32 bit register using RTL on FPGA.

Logichive solutions, *Research and Development Engineer (Part-Time), Mysuru* Nov 2015-Nov 2016

- Developed engineering projects, such as, attendance management system using RFID cards, Wireless irrigation System.

PROJECTS

5G NR Channel Estimation by DM-RS and CSI-RS | MATLAB, 3GPP, 5G NR 2021
- Developed algorithm for estimating channel using DMRS and CSI-RS for multiple users. *Classroom Project*

AR Switch | C# and Embedded C 2019
- Developed AR technology to turn on/off appliance (using Unity and Vuforia). *Personal Project*

Indoor mapping leveraging Ultrasonic frequencies | Embedded C and Kotlin 2019
- Frequency above 20KHz is used to map indoor location. *Final year Project*

Handwriting Clustering *| Python* 2018
- Grouping of handwriting samples into number of clusters based on similarity (k-means clustering). *Personal Project.*

Smart headphones | Python and Embedded C 2017
- Hardware module for headphone, and software which toggles audio based on status of headphone. *Personal Project.*

Register Design using Verilog | Verilog and HDL 2017
- Designed the memory register with all functionalities. *Under MMRFIC.*

Other Personal Projects Wireless Irrigation System(2017), Game playing glove, Robots using 8051 and Arduino(2016), Attendance Management(2016), Smart Water Pump(2017), Speech to Image generation(2019)