

T Rajavardhan

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Employment History

- Aug 2010 – Jul 2012 📌 **Junior Telecom Officer, BSNL.** in Maharashtra, India.
Sep 2021 – Aug 2023 📌 **Senior Application Engineer @ Ansys** in Bangalore, India.

Education

- 2023 – 📌 **Gaduate Student**
Enrolled for Professional Masters in High Speed Digital Engineering.
- 2012 – 2021 📌 **M.Tech + PhD, IIT Madras**
Thesis title: *Multipole Analysis of RF Antennas & Dynamic Link Analysis of IITMSAT.*
- 2004 – 2009 📌 **B.Tech, JNTU Hyderabad** Electronics and Communication Engineering

Research Publications

Journal Articles

- 1 Talashila, R., & Ramachandran, H. (2021). Effect of polarization on the link dynamics of a spinning low-earth orbits satellite aligned with geomagnetic field. *Engineering Reports*, n/a(n/a), e12402.
🔗 doi:https://doi.org/10.1002/eng2.12402. eprint:
https://onlinelibrary.wiley.com/doi/pdf/10.1002/eng2.12402
- 2 Talashila, R., & Ramachandran, H. (2020). Multipole Expansion of Radiation From Patch Antenna Using Quasi-Static Surface Currents. *IEEE Antennas and Wireless Propagation Letters*, 19(12), 2136–2140.
🔗 doi:10.1109/LAWP.2020.3024706
- 3 Talashila, R., & Ramachandran, H. (2019). Determination of Far Fields of Wire Antennas on a PEC Sphere Using Spherical Harmonic Expansion. *IEEE Antennas and Wireless Propagation Letters*, 18(4), 646–650. 🔗 doi:10.1109/LAWP.2019.2900291







Conference Proceedings

- 1 Rajavardhan, T., & Ramachandran, H. (2016). Theoretical analysis and simulation of inverted F antennas on a finite ground plane for satellite applications. In *2016 Progress in Electromagnetic Research Symposium (PIERS)* (pp. 4704–4706). ZSCC: 0000001. 🔗 doi:10.1109/PIERS.2016.7735728

Skills

- | | |
|--------------|--|
| Coding | 📌 Python, Matlab, C, Fortran |
| EM Softwares | 📌 Ansys AEDT, Ansys SIwave, CST Microwave Studio. |
| Others | 📌 Keysight: BenchVue, SystemVue, VSA |
| Equipment | 📌 VNA, Spectrum Analyzer, Signal Generators, Oscilloscopes |

Projects

- Sep 2021 – Till Date  **Application Engineer II** Involved in customer interactions for solving service requests pertaining to the tools Ansys AEDT, SIwave and topics related to queries on SI-PI, EMI-EMC, Antennas etc. Also, I am a part of "Digital Beam-forming Architecture (DBF)" which is a consultation project to AFRL-USA. It involves modelling a RF Front-End of DBF in SystemVue.
- **Tools:** Ansys AEDT, SIwave, Keysight SystemVue
- 2020 – 2021  **Filter and FSS design for 5G** Designed, fabricated and tested a custom bandpass filter centered at 3.5GHz for 5G RRH. Worked on possible Frequency Selective Surface designs to be used as a spatial filter for the RRH. Concurrently got familiar with 3GPP specifications and mmWave circuits being developed as part of the 5G testbed project.
- **Tools:** Ansys HFSS, CST Microwave Studio
- June-Aug 2019  **Internship @ JFWTC, GE, Bangalore** Successfully completed internship at JFWTC, GE. It involved simulating and measuring the properties of discontinuities in waveguides.
- 2017 – 2020  **Multipole analysis of radiation from antenna** Proposed a novel method for finding the far-field radiation patterns of conformable wire antennas on PEC sphere using only electro-static and magneto-static laws. It employs the method of images and multipole expansion of the EM fields to obtain the coefficients of the multipole expansion. The method is extended to analyze patch antennas considering the magnetic currents on its edges and the duals of the static laws. Simple approximations are applied to pyramidal horn structure to obtain the multipole expansion and correspondingly the near-field characteristics including the localized energy.
- **Tools:** Python, Ansys HFSS, CST Microwave studio
- 2014 – 2017  **Monte Carlo Simulation of Charge carriers in semiconductors** Photoconductive antennas use ultrafast laser excitations to emit THz pulses. The response of the charge carriers in the semiconductor substrate to the femtosecond laser pulses are responsible for the emitted THz radiation. Monte Carlo simulation of charge carriers in such conditions using Semiconductor Bloch Equations is carried out. This kind of analysis is also used for the evolution of the spin of an ensemble of electrons for Spintronics applications.
- **Tools:** CUDA Fortran
- 2017 – 2018  **Dynamic Link Budget of IITMSAT and Desing of Onboard Antennas** IITM-SAT is a student satellite project at IIT Madras. Simulated different configurations of the onboard antennas in HFSS to meet the mission requirements and constraints involved. The antennas are fabricated and the antenna characteristics including the measured gain patterns and return loss are in good agreement with the simulation results. A rigorous analysis of the link aspects has been done taking into consideration limited attitude control for the "Chennai" ground station. The use of polarization diversity at the downlink of ground station is justified with this work.

Projects (continued)

2013 – 2014

📖 Design of Antennas for IITMSAT

- **Tools:** Python, Ansys HFSS, CST Microwave studio

Teaching Assistant

2016-2020

📖 Teaching Assistant at IIT Madras

- Transmission Lines and EM waves @ NPTEL
- Computer Methods in Electrical Engineering

Courses

2012-2018

📖 at IIT Madras

- Wave Propagation for Communications
- Microwave Physics
- Wave Guides, Microwave Circuits and Antennas
- Phased Array Systems : Design and Analysis
- Computational Electromagnetics
- Analog and Digital Circuits
- VLSI Technology
- Computer Methods in Electrical Engineering
- Applied Linear Algebra for EE
- Introduction to DSP
- DSP Application Lab
- Introduction to Photonics
- Advanced Photonics Laboratory
- Fiber Optic Communication Technology
- Optical Signal Processing and Quantum Communication
- Optical Engineering
- Laser Theory
- Ultrafast Lasers and Applications
- Integrated Optoelectronics Devices and Circuits