

# Niraj Yadav

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## Professional Summary:

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Accomplished RF Engineer with 7+ years of experience in MRI System Design, Specializing in RF Coils for 1.5T & 3T systems. Expert in PCB design, simulation, and project leadership. Looking to use technical and managerial skills globally.

## Education:

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**Master of Engineering, *Electronics and Telecommunication Engineering***

**July 2016 – March 2019**

*University of Mumbai, St. Francis Institute of Technology, Mumbai*

**GPA:8.40/10.00**

Relevant Coursework: Microwave Engineering, Modern Digital Signal Processing, Statistical Signal Processing, Optical Communication Networks, Next Generation Networks, and Cryptography.

## Technical Skillsets:

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**Theoretical:** RF Fundamentals, Antenna Theory, Electromagnetic Theory, MR Fundamentals, RF Coils for MRI.

**Software:** CST Microwave Studio, MATLAB, Simulink, ANSYS HFSS, Agilent ADS, LT Spice.

**Testing:** Multimeter, Network/Spectrum/Impedance Analyzer, Function Generator, DC Power Supply, LCR Meter, MRI System and Oscilloscopes.

**Troubleshooting:** RF Coils for MRI Applications (Volume & Surface) and its subparts (Balun, Decouplers, LNAs /Preamplifiers), Coil Matching Network, Antennas, RF Devices (Hybrid Couplers, Power Combiners/Dividers, RF Switches, RF Filters).

## Professional Experience:

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**Senior Electrical Engineer – RF Coils, *Philips Healthcare Innovation Center***

**February 22 – October 24**

Working on RF Receive Coils and RF Subsystems for 1.5T & 3.0T MR Systems, following are the list of tasks conducted in synchronization:

- Tuning, debugging & troubleshooting of RF Coils, Test Jig, PCB Assemblies.
- Simulation of RF receive array coils using CST MWS for various configurations (16,20,24 & 28 channels) for sensitivity analysis.
- PCB Package simulation using CST MWS.
- Performing GAP Analysis for legacy coils for both 1.5T & 3T MR systems.

- Drafting, reviewing and approving documents as per Philips standards.
- Collaborating along with the supplier & internal cross functional teams for a smooth execution of the transfer projects.
- Identified and mitigated risks associated with components for MR applications.
- Trained Engineers in simulating complex coil arrays using CST Microwave Studio.

**Design Engineer – RF Coils, *VoxelGrids Innovations Private Ltd.***

**June 21 – January 22**

Worked on RF Receive Coils and RF Subsystems for 1.5T MR Systems, following are the list of tasks which were conducted in synchronization:

- Designed & Developed Torso Array Coil for Human Chest and Abdomen Region.
- Designed & Developed General Purpose Flex Array coil for Human Knee, Ankle, Elbow, and other Extremities which are not covered by other dedicated coils.
- Completed Sensitivity analysis of four, six & eight channel General Purpose Flex Array coil using CST Microwave Studio and Octave/MATLAB.
- Developed and evaluated floating cable traps for surface coil assemblies.
- Performed Theoretical Analysis wherever necessary for selecting components for designing the RF Coils and the PCBAs.
- Troubleshooted PCB Assemblies by referring to Design Files of the existing RF Coils.
- Drafted Requirements Specifications documents, Technical Specifications Documents, Safety Specifications documents and other documents.

**Research Scientist, *Society of Applied Microwave Electronics Engineering and Research (SAMEER)* July 18 – May 21**

Worked primarily on Volume Coils (Head, Knee & Body) and RF Subsystems for 1.5T MR Systems, following are the list of tasks which were conducted in synchronization:

- Modeled PCB Gerber for Birdcage Coil in Keysight Agilent ADS.
- Developed, evaluated and simulated the Quadrature fed Birdcage coils and supporting microwave subsystems for the 1.5 Magnetic Resonance Imaging system.
- Validated and verified the Flexible/Compact Hybrid Coupler using co-axial cable with inductive and capacitive loading technique.
- Analyzed and supported the single channel surface coil design and microwave systems for MRI applications.
- Developed and assessed the RF Absorptive Switch aligning with the RF Front End for Birdcage Coils.
- Heavily involved in integration of the MRI Transmit/Receive Chain.
- Built and administered the development of the TEM based surface coil for 1.5T MRI system and subsystems.

- Spearheaded the MRI system development with the scientists and cross-functional RF engineering teams by finding and acknowledging the gaps and risks.
- Consistently met the deadlines with the team by managing cross-functional RF projects and training junior engineers with the projects.

### Trainee RF Engineer, *SAMEER*

July 17 – January 19

Completed my master's Thesis on Body Birdcage Coil for 1.5T MR Systems, following are the list of tasks which were carried out in synchronization:

- Designed & Developed RF Body Coil using CST Microwave Studio.
- Compared the modes of the Birdcage Coil using CST and MATLAB.
- Implemented and Validated hardware portions of the RF Body Coil.
- Simulated, Analyzed and Validated Hybrid coupler, and Balun using Agilent ADS.
- Performed SAR Analysis for the Phantom inside the Body Birdcage Coil.
- Assisted Research scientists with development of the MRI systems and subsystems.
- Executed Scans on the phantom, fruits & rats to evaluate the performance of Birdcage Coil using different Pulse sequences.

### Certifications:

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1. Philips: Schematic Entry Learning Path in Expedition Flow (April 2022)
2. MATLAB Onramp (Jan 2022)
3. Advanced Excel Formulas (April 2023)

### Publications:

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1. **Niraj Yadav**, I. Kochar, T. K. Bhuiya and R. Harsh, "RF Transmit/Receive Quadrature Fed Body Birdcage Coil for a 1.5T MR System, 2018 second International Conference on Electronics," Materials Engineering & Nanotechnology (**IEMENTech**), Kolkata, 2018, pp. 1-7.  
**DOI:** 10.1109/IEMENTECH.2018.8465171
2. **Niraj Yadav**, Miheer Mayekar, Rajesh Harsh, and Vishal Boricha, "Analysis of the effects of Absorptive Switch v/reflective Switch on the performance of Hybrid Coupler designed for Birdcage coil at 1.5T MRI System," **ISMRM** 2020, Sydney, NSW, Australia.

3. Rohit Apurva, **Niraj Yadav**, Miheer Mayekar, Rajesh Harsh, “Miniaturized Quadrature Hybrid Coupler Using Coaxial Cable with Inductive Loading for 1.5T MRI System,” **ISMRRM** 2020, Sydney, NSW, Australia.
4. Rohit Apurva, **Niraj Yadav**, T K Bhuiya and Rajesh Harsh, “Development of Compact and Flexible Quadrature Hybrid Coupler Using Coaxial Cable with Capacitive Loading for 1.5 T Indigenous MRI System”, *Progress in Electromagnetics Research Letters*, Vol. 93, 143–151, 2020.

### **Awards:**

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Won **First Prize** for presenting and showing the “**MRI Prototype**” on the *Science Day* 2019 held at SAMEER Mumbai.

*Niraj Yadav*

26-08-2024