Rakesh Sinha, Ph.D.

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https://sites.google.com/view/cemcdlab/home

Employment History

2020 – · · · · **Assistant Professor,** Department of Electrical Engineering, National Institute of Technology Rourkela, India.

2018 – 2019 **Postdoctoral Research Associate** Chungnam National University (CNU), Daejeon, South Korea.

2017 – 2018 **Postdoctoral Research Associate** Ulsan National Institute of Science and Technology, Ulsan, South Korea.

2016 –2017 **Assistant Professor,** Department of Electronics and Communication Engineering, JIS College of Engineering, Kalyani, India.

Education

2011 – 2016 **Ph.D., Indian Institute of Technology Kharagpur** RF & Microwave Engineering.
Thesis title: *Synthesis of Asymmetric Multiport Network.*

2009 – 2011 **M.Tech., Indian Institute of Technology Kharagpur** in RF & Microwave Engineering.
Thesis title: *Analysis of impulse response and UWB antenna for time domain measurement.*

2004 – 2008 **B. Tech., Kalyani Government Engineering College** in Electronics & Communication Engineering.
Thesis title: *Prepaid Electricity Meter.*

Research Publications

Journal Articles

1. **R. Sinha**, "Design guidelines and applications for dual-band rat-race couplers and gysel power dividers with unequal amplitude imbalances [application notes]," *IEEE Microwave Magazine*, 2025. DOI: 10.48550/arXiv.2407.11064.
2. **R. Sinha**, "Solutions for quadrature/nonquadrature branch line coupler with equal/unequal power division [application notes]," *IEEE Microwave Magazine*, vol. 25, no. 4, pp. 86–95, 2024. DOI: 10.1109/MMM.2023.3329691.
3. S. Ghosal, **R. Sinha**, A. De, and A. Chakrabarty, "Characteristic mode analysis of mutual coupling," *IEEE Trans. Antennas & Propagation*, vol. 70, no. 2, pp. 1008–1019, 2022. DOI: 10.1109/TAP.2021.3119117.
4. **R. Sinha**, "Computer-aided design of multi-section matching networks with desired phase-shift," *IEEE Trans. Circuits Syst. II, Express Briefs*, vol. 69, no. 12, pp. 5074–5078, 2022. DOI: 10.1109/TCSII.2022.3201114.
5. **R. Sinha**, "Design of multi-port with desired reference impedances using y-matrix and matching networks," *IEEE Trans. Circuits Syst. I, Reg. Papers*, vol. 68, no. 5, pp. 2096–2106, 2021. DOI: 10.1109/TCSI.2021.3061773.
6. S. Ghosal, **R. Sinha**, A. De, A. Chakrabarty, and H. Son, "Theory of coupled characteristic modes," *IEEE Trans. Antennas & Propagation*, vol. 68, no. 6, pp. 4677–4687, 2020. DOI: 10.1109/TAP.2020.2969852.

7. **R. Sinha** and A. De, "Synthesis of multiport networks using port decomposition technique and its applications," *IEEE Trans. Microw. Theory Techn.*, vol. 64, no. 4, pp. 1228–1244, 2016. DOI: 10.1109/TMTT.2016.2532868.
8. **R. Sinha** and A. De, "Theory on matching network in viewpoint of transmission phase shift," *IEEE Trans. Microw. Theory Techn.*, vol. 64, no. 6, pp. 1704–1716, 2016. DOI: 10.1109/TMTT.2016.2558645.
9. **R. Sinha**, A. De, and S. Sanyal, "A theorem on asymmetric structure based rat-race coupler," *IEEE Microw. Wireless Compon. Lett.*, vol. 25, no. 3, pp. 145–147, 2015. DOI: 10.1109/LMWC.2014.2382661.

Software

1. **R. Sinha**, *Impedance transforming rrc and blc*, version 1.0, Apr. 2024. DOI: 10.5281/zenodo.10968449.
2. **R. Sinha**, *Phase shifting impedance matching network 2.2*, version 2.2, May 2024. DOI: 10.5281/zenodo.11402252.
3. **R. Sinha**, *Quadrature/non-quadrature branch line coupler with equal/unequal power division*, version 1.2, May 2024. DOI: 10.5281/zenodo.11096435.
4. **R. Sinha**, *Single/ dual-band rat-race coupler and gysel power divider with unequal power division ratio*, version 1.2, May 2024. DOI: 10.5281/zenodo.11199141.

Skills

Languages	Strong reading, writing and speaking competencies for English, Hindi, Bengali.
Coding	Python, MATLAB, SCILAB, GNU Octave, Mathematica, LaTeX, …
RF Simulation Tools	Agilent ADS, IE3D, HFSS, CST Microwave Studio, Ansoft Designer.
Hardware Skill	Vector Network Analyzer, Spectrum Analyzer, Signal Generator, Oscilloscope, VSWR Meter, Power Meter.
Misc.	Academic research, teaching, training, consultation, LaTeX typesetting and publishing.

Miscellaneous Experience

Awards and Achievements

2024 **Institute Gold Medal for Best Undergraduate Project**, Mr. Ayushman Raghuvanshi received the best UG Project Award from NIT Rourkela.

2023 **IEEE AP- S Undergraduate Summer Research Scholarship**, Mr. Ankit Mishra received UG Research Scholarship from IEEE AP-S.

IEEE MTT-S Undergraduate/Pre-graduate Scholarship, Mr Sankhadeep Das received UG Scholarship from IEEE MTT-S.

References

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Prof Robert Caverly
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