



SHILPA UDAY KHARCHE (PhD, IIT Bombay)

D.O.B: 31/05/1981

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Short Biodata:

As a highly dedicated Professor and Head of the Department of Electronics and Telecommunication Engineering at Terna Engineering College, Navi Mumbai, I am highly committed to the growth of students, faculty and the department. Serving as the Member of Board of Studies, Electronics and Telecommunication Engineering, Mumbai University. I actively contribute to shaping the academic landscape of the university and institution. I am looking after the accreditation like NBA, NAAC and the ranking (NIRF) of the Institute. I am a recognized PhD and PG guide of Mumbai University.

My expertise lies in the dynamic field of MIMO antenna technology, where my research has garnered widespread recognition, with over 302 citations. I have made significant contributions to antenna design, encompassing diverse areas such as Diversity/MIMO antennas, UWB antennas, Multilayer and high Gain antennas, as well as circularly polarized monopole and microstrip antennas. I have successfully undertaken consultancy projects and effectively transferred technological advancements to esteemed organizations such as the Defense Research and Development Organization (DRDO) and Mercedes Benz Research and Development India (MBRDI). I have undertaken my ME research work on Millimeter wave thin film microstrip line structures at the prestigious Tata Institute of Fundamental Research (TIFR) in Colaba, Mumbai.

As a recognized authority in my field, I have been entrusted with the responsibility of Member of Advisory Committee of Infitron Advanced Systems Pvt Limited, Ahmedabad, Gujarat. I Moreover, I have imparted knowledge in training programs for employees of Tech Mahindra, as part of the MS course conducted by BITS.

I am a reviewer of submissions for esteemed peer-reviewed journals, including IEEE Access, Progress in Electromagnetic Research (PIER), Journal of Electromagnetic Waves and Applications (JEMWA), International Journal of Speech Technology (IJST), Springer Journal, and International Journal of Electronics and Communication (IJEC). I have developed expertise in utilizing advanced simulation and software tools such as IE3D, CST Microwave Studio, MATLAB, and measurements, consistently striving to explore innovative methods for design and simulation of components and systems.

Currently, my research interest revolves around the MIMO/diversity antenna design and RF planning, with a focus on unlocking the potential of 5G applications. Passionate about staying at the forefront of technological advancements, I eagerly embrace opportunities to leverage new tools and methodologies in pursuit of meaningful solutions.

Responsibilities Handled:

- Member, Board of Studies, Electronics and Telecommunication Engineering, Mumbai University
- Member, Advisory Committee, Infitron Advanced Systems Pvt Limited, Ahmedabad, Gujarat
- Member, Result Moderation Committee, Mumbai University
- Head of the Department, Electronics and Telecommunication Engineering - Current
- Dean Academics - (2020 - 2024)
- Recognized PhD and PG Guide, Mumbai University

- IQAC Coordinator
- Institute Accreditation and Ranking Coordinator : NBA, NAAC, NIRF
- Co-convenor of Equinox 2018-4th International Conference on Engineering Confluence
- Research Center Coordinator, Terna Engineering College, Nerul
- Chief Exam Conductor

Patents/ Products/ Consultancy:

Products Developed:

Ultra-wideband, dual transmit/receive, dual polarized, spiral diversity antenna for ASL, DRDO, Hyderabad

Patents:

1. "MIMO Diversity Antenna", Published in Jan 2023, (Application No. 338999-001)
2. "Low profile, Ultra-wideband Microstrip Array Antenna sandwiched between reactive impedance surfaces" (Application No. 201621026724/MUM/2016)

Consultancy Projects:

1. Development of transmit/ receive, dual polarized, spiral diversity antenna- Developed for Advanced Systems Laboratory (ASL), DRDO, Hyderabad

In this project, a wide band (1.7 GHz to 10 GHz) antenna with circular polarization for transmit/receive diversity is designed, fabricated and measured. Spiral antenna elements along with Dielectric loading and scaling are used to achieve broadband circular polarization with compact size. The spirals are arranged in opposite configuration sense which is used for detection of circularly-polarized waves of either polarization sense. A wide band balun is designed to feed the antenna structure. Antenna is enclosed in elliptical shape housing. A broad impedance and AR bandwidth is obtained. The prototype is fabricated, measured and technology is transferred to DRDO.

2. Effect of Bumper on Full Wave Electromagnetic Simulation of 76-77 GHz RADAR Sensor and observe the effects of integration into the vehicle for Mercedes-Benz Research & Development, India, Bangalore.

In this project, an analysis and evaluation of the effect of bumper and multiple paint layers on the anti- collision 76-77 GHz radar sensor characteristics is evaluated. Mathematical analysis is done to (1) identify the characteristics of bumper material to keep the dielectric losses less than 3 dB and bidirectional losses < 10 dB, (2) determine if the multilayer painted bumper can be replaced by an equivalent single layer so that simulation complexity and time can be reduced, (3) identify the effect of water/snow/asphalt on the bumper characteristics. Apart from mathematical modeling, full wave EM simulations of the integrated sensor and bumper are carried out.

Reviewer:

1. IEEE ACCESS
2. Progress in Electromagnetic Research (PIER)
3. Journal of Electromagnetic waves and Applications (JEMWA)
4. International Journal of Speech Technology (IJST), Springer Journal
5. International Journal of Electronics and Communication (IJEC) and conferences

Technical Knowledge:

- Detailed MIMO Antenna design and measurements
- Performance Analysis of MIMO/Diversity Antennas
- Design of High gain Antenna structures
- RF Impedance matching network design
- RF passive components design and development
- RF amplifier and Oscillator design
- TCP/IP Protocol suite

Major Courses:

- Radiating Systems
- RF Circuit Design
- RF and Microwave Communication Systems
- Internet Communication Engineering
- Computer Networks

Citation Analysis:

302 citations (h-index 10 and i10-index 10) in google scholar

<https://scholar.google.com/citations?user=g40vgvEAAAJ&hl=en>

List of Publication:

Journal Publications:

1. Lalit Sahoo, Biswajeet Mukherjee, Shilpa Kharche, "Design and Analysis of Four Element MIMO Antenna for Broadband Applications", Accepted for publication in International Journal of Applied Electromagnetics and Mechanics, 08/01/2025
2. Shilpa Kharche, Sandeep Raskar, Sahil Thakur, Suraj Patil, Sahil Mhatre, "A Digital Twin Framework for Wireless Network and Real-Time Analysis", J. Electrical Systems 20-3 (2024): 8930-8938
3. Vinayak Mahadik, Jogesh Chandra Dash, Raju Malleboina, Shilpa Kharche, Debdeep Sarkar, Wideband SIW Based Frequency Selective Surface using Exponential Tapering Technique. TechRxiv. March 06, 2024.
4. J C Dash, S Kharche, G S Reddy, "MIMO Antenna Mutual Coupling Reduction Using Modified Inverted Fork Shaped Structure", IEEE Canadian Journal of Electrical and Computer Engineering, Vol 45, issue 4, 2023, 375-382.
5. J C Dash, S Kharche, G S Reddy, "MIMO Antenna Mutual Coupling Reduction Using Modified Inverted Fork Shaped Structure", Techrxiv, Submitted 15-06-2022 / posted 17-06-2022, TechRxiv. Preprint. <https://doi.org/10.36227/techrxiv.20071844.v1>
6. Gain and bandwidth enhancement of circularly polarized MSA using PRS and AMC layers, SD Jagtap, RK Gupta, N Chaskar, SU Kharche, R Thakare, Progress In Electromagnetics Research, 2018, Vol 87, 107-118
7. S. Jagtap, A. Chaudhari, N. Chaskar, S. Kharche, and R. K. Gupta, "A Wideband Microstrip Array Design Using RIS and PRS Layers", IEEE Antennas and Wireless Propagation Letters, Vol. 17, No. 3, March 2018.
8. S. Kharche, G S Reddy, R K Gupta and J Mukherjee, "A wide Band Circularly Polarized

Diversity Antenna for Satellite and Mobile communication”, IET Microwaves, Antennas and Propagation (IET-MAP) Volume 11, Issue 13, 20 October 2017, p. 1861 – 1867. **(Among top 50 most frequently accessed documents for Nov 2017)**

9. S. Kharche, G S Reddy, R K Gupta and J Mukherjee, “MIMO Antenna for Bluetooth, Wi- Fi, Wi-Max and Uwb Applications”, Progress in Electromagnetics Research PIER C, Vol. 52, page 53-62, 2014.
10. G. S. Reddy, A. Kamma, S Kharche, J Mukherjee, S K Mishra, “Cross-Configured Directional UWB Antennas for Multidirectional Pattern Diversity Characteristics”, IEEE Transactions on Antennas and Propagation, Vol. 63, Issue 2, 2015, Page(s): 853 - 858
11. G. S. Reddy, A. Chittora, S. Kharche, S. K. Mishra, and J. Mukherjee, Bluetooth/UWB Dual-Band Planar Diversity Antenna with Wimax and WLAN Band-Notch, Progress In Electromagnetics Research B, Vol. 54, 303-319, 2013
12. G. S. Reddy S. Kharche, and J. Mukherjee et al, “High Gain and Low Cross Polar Compact Printed Elliptical Monopole UWB Antenna Loaded with Partial Ground and Parasitic Patches” Progress in Electromagnetic Research (PIER B), Vol 43, 151- 167, 2012.
13. A. Chaudhary, S. Kharche, R K Gupta, “Trident feed parallel metal plated U-shape omnidirectional UWB antenna” selected in International Journal of Electronics and Telecommunication Technology, IJECT, ISSN-2230-7109.
14. Sangam Kamble, Shilpa Kharche, “Obstacle Detection Using LIDAR”, International Journal of Scientific Research and Engineering Trends (IJSRET), Volume 7, Issue 4, July-Aug-2021, ISSN 2395-566X
15. Vinayak Mahadik, Shailaja Gawde, Shilpa kharche, Rajiv Kumar Gupta, “ Circularly polarized monopole Antenna”, international Journal of creative research Thoughts, Vol 12, Issue 9, September 2024

Conferences and Workshops Publications:

1. Sandeep Raskar, Shilpa Kharche, Vishal Gotarane, “Analyzing Healthiness of Fast Food Items Using Statistics and Machine Learning”, International conference on Artificial Intelligence in Healthcare, Education and Industry 4.0 (IDICAIEI), DMIHER, Nov 2024 (IEEE Conference)
2. Vinayak Mahadik, Jogesh Chandra Dash, Raju Malleboina, Shilpa Kharche, Debdeep Sarkar, Wideband SIW Based Frequency Selective Surface using Exponential Tapering Technique. Accepted for publication in IEEE MAPCON 2024, Dec 9-13, 2024.
3. Sandeep Raskar, Shilpa Kharche, Vishal Gotarane, “Analyzing Healthiness of Fast Food Items Using statistics and Machine Learning”, Accepted for publication in International conference IDICAIEI 2024, Nov 27-29, 2024.
4. Shailaja Gawade, Shilpa Kharche, “ A Review on Polarization Reconfigurable Monopole Antennas”, 6th International Conference on Engineering, Research and Innovations – Equinox 2021, June 2021, Nerul, Navi Mumbai, Maharashtra
5. JC Dash, N Kalva, S Kharche, J Mukherjee, Isolation Enhancement of Closely Spaced MIMO System Using Inverted Fork Shaped Decoupling Structure, 2020 14th European Conference on Antennas and Propagation (EuCAP), 1-3
6. JC Dash, S Kharche, J Mukherjee, Closely Spaced Series Fed Tapered Arrays for Base Station Massive MIMO Application, 2019 IEEE Indian Conference on Antennas and Propagation (InCAP), 1-4
7. JC Dash, S Kharche, J Mukherjee, V Dhoot, R Makanaboyina, A Model for Equivalent Loss Tangent of Multilayered Media for Automotive Radar Applications, 2019 13th European Conference on Antennas and Propagation (EuCAP), 1-4
8. Shilpa U Kharche ; G. Shrikanth Reddy ; Jayanta Mukherjee ; Rajiv Kumar Gupta, Circularly

- polarized L shape diversity antenna for WiMAX applications, 2018 IEEE Indian Conference on Antennas and Propagation (InCAP)
9. GS Reddy, SU Kharche, Elliptical UWB antenna loaded with Rectangular Split loop resonator (RSLR) and semi-elliptical slot for multi band rejection, 2017 IEEE International Conference on Antenna Innovations & Modern Technologies for Ground, Aircraft and Satellite Applications (iAIM)
 10. S. Kharche, G. S. Reddy, R. K. Gupta, and J. Mukherjee, "Mutual Coupling Reduction by Using Tilted Variable Length SRR like structure in UWB MIMO Antennas", 2017 IEEE AP-s Symposium on Antennas and propagation and USNC- URSI Radio Science Meeting, San Diego, California, USA.
 11. S. Kharche, P. Patel, J. Mukherjee, P. Ratna, U. P. Verma, "Broadband Spiral Diversity Antenna with Dielectric Loading", 2017 IEEE AP-s Symposium on Antennas and propagation and USNC- URSI Radio Science Meeting, San Diego, California, USA.
 12. S. Kharche, G. S. Reddy, R. K. Gupta, and J. Mukherjee, "Mutual Coupling Reduction Using Shorting Posts in UWB MIMO Antennas", IEEE APMC/IMaRC 2016, Delhi, India, 2016.
 13. G. Shrikanth Reddy, S. Kharche, Jayanta Mukherjee, "Symmetric/Asymmetric CPW Feed Compact UWB Antenna with Polarization Diversity Characteristics", IEEE Asia Pacific Microwave Conference (APMC-2016), New-Delhi, India.
 14. Snehal Patil, Rajiv Gupta, Shilpa Kharche, "Gain Improvement of Lower UWB Monopole Antenna using FSS Layer," IEEE International conference on Nascent Technologies in Engineering, 2017, Mumbai, India
 15. Anjali A. Chaudhari, VidyaJadhav, Shilpa Kharche and Rajiv K. Gupta, "Compact Dual- Band MIMO Antenna with High Isolation for 3/4G, Wi-Fi, Bluetooth, Wi-MAX and WLAN Applications," PIERS 2016, Singhai, China.
 16. Anjali A. Chaudhari, Anjali Rochkari, Shilpa Kharche and Rajiv K. Gupta, "Microstrip MIMO/Diversity Antenna with High Isolation for WLAN Applications", PIERS 2016, Singhai, China.
 17. S. Kharche, G S Reddy, R K Gupta and J Mukherjee, "Mutual Coupling Reduction Using Variable Length SRR Like Structure in Ultra-Wideband MIMO Antennas", IEEE IMaRC 2015, Hyderabad, India
 18. S. Kharche, G S Reddy, R K Gupta and J Mukherjee, "High gain UWB Antenna with Unidirectional Radiation Pattern", IEEE CONECCT, IISC Bangalore, Jan 2014
 19. S. Kharche, G S Reddy, R K Gupta and J Mukherjee, "Ultra-Wide Band Antenna for Repeater Applications", IEEE APMC, Japan, Nov 2014.
 20. S. Kharche, G S Reddy, R K Gupta and J Mukherjee, "Metal Plated Circular Sector Monopole Antenna", IEEE MTT's iAIM 2015, Dec 2015, Ahmedabad.
 21. S Kharche, G S Reddy, R K Gupta and J Mukherjee, "Metal Efficient Integrable Parallel Metal Plated UWB Antenna", Accepted at Antenna Test and Measurement Symposium (ATMS) 2016, Goa.
 22. G S Reddy, S Kharche, S Gadgil, K P Ray, "Efficient High Gain Hexagonal Patch Antenna with a Superstrate Layer", IEEE MTT's iAIM 2015, Dec 2015, Ahmedabad.
 23. Shilpa Kharche et al, "UWB Circular monopole antenna" presented at International Conference on Electronics Engineering and Grid Systems (ICEEGS), March 2013.
 24. Shilpa Kharche, G S Reddy et al, "Efficient High Gain Hexagonal Patch Antenna with a Superstrate Layer," Antenna Test and Measurement Symposium, ATMS India 2013, Kolkata, 2013.
 25. Shilpa Kharche et al, "Printed Compact Elliptical Monopole Antenna for UWB Applications", Antenna Test and Measurement Symposium, ATMS India 2013, Kolkata, 2013.

26. Aparna Deshmukh, Shilpa Kharche, Rajiv Gupta, "Gain Enhancement of Microstrip Patch Antenna with Metamaterial Cover" Selected at International Symposium on Microwaves (ISM 2012), Bangalore, Dec 2012.
27. Shilpa Kharche, Gaurav Jaiswal, Shriganesh Prabhu, Achanta Venugopal, R C Sethi, "Design and Evaluation of Millimeter Wave Microstrip Line" presented at International Conference NUiCONE, 2010, Ahmedabad.
28. Shilpa Kharche, R C Sethi, P U Dere , "Millimeter Wave Microstrip Line" Presented at International Conference on Sunrise Technologies, ICOST 2010, Dhule.
29. Shilpa Kharche, R C Sethi, P U Dere , et al, "Evaluation and Fabrication of Thin Film Microstrip Line" Presented at National Conference on Nascent trends in Information and Communication Technology, Equinox 2010, Terna Engineering College, Nerul.
30. Won Best poster for "Technology and Applications of Magnetic Plasmons" Poster Presentation at National Conference on Nascent Trends in Information and Communication Technology, Equinox 2010, Terna Engineering College, Nerul.

Professional Qualification:

Ph.D in Electrical Engineering, 2017

Indian Institute of Technology, Bombay, Maharashtra

Master of Electronics and Telecommunication Engineering, 2011

Mumbai University, Maharashtra

Bachelor of Electronics and Telecommunication Engineering, 2002

North Maharashtra University, Jalgaon, Maharashtra

Research and Scholarly Contributions:

Ph.D. Research: Multielement and High Gain Ultra-Wide-Band Antenna. [Dec.2011-Aug. 2017]
Supervisor: Prof. Jayanta Mukherjee, Department of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, Maharashtra, India.

M. E. Research: Fabrication and measurement of millimeter wave Thin film Microstrip Line (TFMSL) [June 2009- June 2011]. The prototype was fabricated and measured at TIFR, Colaba. Mumbai, Maharashtra

Supervisor: 1. Dr. R. C. Sethi, (Department of Electronics and Telecommunication Engineering, Terna Engineering College, Nerul, Navi Mumbai), Mumbai University, Maharashtra, India. 2. Prof Achanta VenuGopal, Department of Condensed Matter Physics and Material Science, Tata Institute of Fundamental Research, Colaba, Mumbai, Maharashtra

Funding Received from AICTE:

All India Council of Technical Education (AICTE) Funded ATAL FDP organized on Electromagnetic interference (EMI) and Electromagnetic Compatibility (EMC) between 13/12/2021 and 17/12/2021.

Software Tools:

1. Well versed with Zeland's IE3D
2. Antenna design using CST Microwave Studio
3. MATLAB

Scientific Association:

Institute of Electrical and Electronics Engineers (IEEE)-Member

Indian Society of Technical Education (ISTE) - Life Member

Experience:

Professor, Terna Engineering College, Nerul. August 2021 to till date

Associate Professor, Electronics and Telecommunication Engineering department, Terna Engineering College, Nerul. Sept 2017 to July 2021

Assistant Professor, Electronics and Telecommunication Engineering department, Terna Engineering College, Nerul. July 2013 to Aug 2017

Assistant Professor, Electronics and Telecommunication Engineering department at Saraswati College of Engineering, Kharghar. Aug 2012 to June 2013

Lecturer, Electronics and Telecommunication Engineering department, Terna Engineering College, Nerul. July 2008 to Dec 2011

Lecturer, Electronics and Telecommunication Engineering department at K.C. College of Engineering, Thane. July 2005 to July 2008

Visiting lecturer, Electronics and Telecommunication at Govt. Polytechnic, Nashik. July 2004 to July 2005

Talks/Guest Lectures Delivered:

1. Expert talk on "MIMO antenna Technology and its applications", in IETE/ETSA Chapter program at Agnel Charities C Rodrigues Institute of Technology, Vashi, 16/03/2024.
2. Expert talk on "MIMO antenna Technology and its applications in Military Communication ", at National workshop on Opportunities in RF Development of Next Generation Defense Systems for the Nation, Gujarat Technological University, Ahmedabad, Gujrat, 04/03/2023.
3. Panelist for Panel Discussion on "Recent Trends in Signal Processing & career Opportunities" at PCET's Pimpri Chinchwad College of Engineering, Pune, 17/07/2021
4. Expert talk on "Massive MIMO in 5G", at FDP on Recent Trends and Advances of next generation 5G Technologies, Lokmanya Tilak College of Engineering (LTCoe), Koperkhairane, Navi Mumbai. 18/06/2021
5. Expert talk on "Research Scope in MIMO antenna and its application in 5G", at FDP on One week's Faculty Development Program on Recent Trends and Development in Modern Antennas, RF and Microwave System at K J Somaiya Institute of Engineering & Information Technology, Sion, Mumbai, 02/06/2019
6. Guest lecture on "Design Guidelines for Microwave and RF" L R Tiwari College of Engineering, Mira road, Sept 25, 2017.
7. A full day session on "Design and Analysis of Microstrip Antenna using IE3D", Saraswati College of Engineering, Kharghar, Feb 6, 2016.
8. Speaker at ISTE approved "STTP on Microwave Devices and Antenna Design", Bharti Vidyapeeth College of Engineering, Kharghar, May 28, 2015.
9. Organized and Conducted "Workshop on Antennas", in collaboration with IEEE TEC at Terna Engineering College, Nerul, Oct 11-12, 2014.
10. Guest lecture on "Multielement and Multilayer UWB antennas", Amrutvahini College of Engineering, Sangamner, Sept 13, 2014.

SESSION CHAIR/JUDGE:

1. Judge for 19th Inter-Collegiate Avishkar Research Convention, Mumbai University, Dec 15, 2024
2. Judge for 18th Inter-Collegiate Avishkar Research Convention, Mumbai University, Dec 15,

2023

3. Session chair for "International conference on Advances in Science and technology - ICAST 2014", Saraswati College of Engineering, Kharghar, Nov 11, 2014.
4. Judge for "National level project Competition and Technical Paper presentation", AVALON – 2014, Terna Engineering College, Nerul, Mar 12, 2014.

Declaration

I hereby declare that the foregoing information is correct and complete to the best of my knowledge.

Shilpa Kharche

Place: Navi Mumbai

Date: 22/01/2025