Dhaval K. Patel

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Google Scholar: https://scholar.google.com/citations?user=RckvvLwAAAAJ&hl=en | **ORCID:** https://orcid.org/0000-0002-1350-4959

"Deep work is a new skill to expedite the process of quick learning to generate the quality outcome for the next-generation digital economy" - Dhaval K Patel

Profile Summary

I am currently working as an Associate Professor at the School of Engineering and Applied Science, Ahmedabad University, India. I served as a visiting faculty member at the Olin College of Engineering in Massachusetts, United States. I have published research papers in IEEE Transactions/Journals and Tier-1 International Conferences. I was honored with the Ahmedabad University Chairman's Awards for "Outstanding Research Contributions" and "Experiment to Advance Active Learning" in 2019 and 2021. I have also received research funding from Telecom Centers of Excellence (TCOE), Department of Telecommunications (DoT) – India, DST-UK India Education and Research Initiative (UKIERI) – British Council (UK), DST – Association of Southeast Asian Nations (ASEAN), and Gujarat Council on Science and Technology (GUJCOST) – Government of Gujarat, India. Additionally, I am a member of professional bodies like IEEE, ISTE, and IETE. My areas of interest include xG wireless networks, intelligent transportation systems, and applied machine and deep learning.

Research Projects - External Grants [INR 2.4 Crs/USD 295K]

[1] Deployment of 6G Accelerated Smart Transportation with C-V2X on Ahmedabad-Rajkot Highway (NH47) Corridor

Three Years

Principal Investigator — *2024-2027*

Funding Agency: Telecom Centres of Excellence (TCOE), Department of Telecommunications (DoT)
Ministry of Communications (MoC), India
Industry Collaborators: Techsture Technologies India Pvt. Ltd.

Project Fund: 74,07,885 INR

[2] Design and Development of 5G Enabled Intelligent Transportation System in Gujarat

Three Years

Principal Investigator — *2022-2025*

Funding Agency: DST-Gujarat Council on Science and Technology (GUJCOST)
Government of Gujarat, India
Partner Institute: SVNIT - Surat
Mentor Institute: IIT - Bombay

Project Fund: 22,10,000 INR

[3] Development of Cohda Wireless 5G Testbed for Intelligent Transportation

One Year

Principal Investigator — *2022-2023*

Funding Agency: University Research Board - Ahmedabad University with GUJCOST

Project Fund: 2,00,000 INR

[4] Cognitive Radio Enabled Vehicular Cyber-Physical System for Urban Area

Three Years

Principal Investigator — *2018-2021*

Foreign Collaborator: ASEAN Foreign Partners:
(1) Dr Guan Yong Liang, NTU- Singapore
(2) Dr Sumei SUN, Institute for Infocomm Research (I2R) Agency for Science, Technology, and Research (A*STAR), Singapore
(3) Dr. CHANG Yoong Choon, UTAR, Malaysia
(4) Dr. Joanne Lim Mun Yee, Monash University, Malaysia
Funding Agency: DST-ASEAN Collaborative R and D Program - International Cooperation (Bilateral)

Project Fund: 32,42,000 INR

[5] Non-parametric Smart Sensing Analytics based on Large Spectrum Data and Estimation of Channel Activity Statistics

Three Years

Principal Investigator — *2017-2020*

Foreign Collaborator: Dr Miguel Lopez-Benitez - UK Partner - University of Liverpool, U.K.
Funding Agency: DST-UKIERI Thematic Partnerships 2016-17 International Cooperation (Bilateral)

Project Fund: 1,20,00,000 INR

[6] Design and Performance Analysis of Non-parametric Detection Algorithm for Cognitive Radio - MIMO Communications — *Two Years*

Principal Investigator — *2016-2019*

Funding Agency: DST-Gujarat Council on Science and Technology
Government of Gujarat, India
Project Fund: 4,30,000 INR

International Exposure - Research Collaboration and Countries Visited

USA (Visa B1/B2, valid till July 30, 2028), U.K., Canada, Germany, Europe, Singapore, Malaysia.

Education

Ph.D. — *2011–2015*

Nirma University — *Gujarat, India*

Institute of Technology, Department of Electrical Engineering

Master of Engineering — *2008–2010*

Gujarat University — *Gujarat, India*

Specialized in Communication Systems

Bachelor of Engineering — *1999–2003*

North Gujarat University — *Gujarat, India*

Specialized in Electronics and Communication Engineering

Professional Experience

Associate Professor — *Ahmedabad, Gujarat*

Department of Computer Science and Engineering, School of Engineering and Applied Science — *Jul. 2021 - Present*

Ahmedabad University

Assistant Professor — *Ahmedabad, Gujarat*

Department of Computer Science and Engineering, School of Engineering and Applied Science — *Dec. 2016 - Jun. 2021*

Ahmedabad University

Senior Lecturer — *Ahmedabad, Gujarat*

School of Engineering and Applied Science — *Oct. 2014 - Jul. 2016*

Ahmedabad University

Lecturer — *Visnagar, Gujarat*

S P College of Engineering — *Jul. 2004 - Jan. 2008*

North Gujarat University

PhD Students

Defended and Completed Thesis: 02, Ongoing: 02

[1] Mr. Kashish Shah — *Ongoing*

Optimizing Integrated Sensing and Communication for 5G-ITS Testbed Deployment in Gujarat-India — *2022-Present*

No. of Publications: IEEE Journal: 01, Tier-1 Conferences: 05
Project Position: JRF with DST-GUJCOST 5G-ITS Project and Research Scholar at MICxN Research Lab, Ahmedabad University.

[2] Mr. Kirtan Kalaria — *Ongoing*

On the Analysis of Integrated Sensing and Communication (ISAC) in Vehicle-to-Everything (V2X) Networks — *2023-Present*

No. of Publications: Tier-1 Conferences: 01
Project Position: Research Scholar at MICxN Research Lab, Ahmedabad University.

[3] Mr. Sagar Kavaiya — *Completed*

Physical Layer Security for Cognitive Vehicular Network — *2017-2022*

Current Status: Launched a new start-up in the field of electronics and embedded systems.

No. of Publications: Journal: 03, Tier-1 Conferences: 03
Project Position: JRF with DST-ASEAN Project

[4] Mr. Brijesh Soni — *Completed*

Design and Performance Analysis of Smart Sensing Framework for Cognitive Radio Networks — *2017-2022*

Current Status: Joined as an Assistant Professor at The Ohio State University, OH.

No. of Publications: Journal: 04, Tier-1 Conferences: 07
Project Position: JRF with DST-UKIERI Project

Awards

[1] Received Best Paper Award — *Bengaluru*

Conference on COMmunication Systems & NETworkS (COMSNETS 2025) — *2025*

Received Best Paper Award, in IEEE 17th International Conference on COMmunication Systems & NETworkS (COMSNETS 2025), Jan 6-10, 2025, Bengaluru - India (https://www.comsnets.org/awards.html)

[2] Received Best Paper Award — *Bengaluru*

Conference on COMmunication Systems & NETworkS (COMSNETS 2023) — *2023*

Received Best Paper Award, in IEEE 15th International Conference on COMmunication Systems & NETworkS (COMSNETS 2023) - Workshop on Connected Vehicles & Autonomous Driving, Jan 3-8, 2023, Bengaluru - India

[3] Received the Chairman's Award for Experiment to Advance Active Learning — *Ahmedabad*

Ahmedabad University - Foundation Day 2021 — *2021*

The award was presented on the 12^{th} foundation day of Ahmedabad University on February 27, 2021.

[4] Shortlisted for Best Paper Award — *Bengaluru*

SPCOM 2020 at IISc Bangalore — *2020*

Research paper "On the Physical Layer Security over α-η-κ-μ Fading for Relay-based Vehicular Networks" was shortlisted for the Best Paper Award Category at SPCOM 2020, July 20-23, 2020.
https://ece.iisc.ac.in/ spcom/2020/award.html

[5] Received the Chairman's Award for Research — *Ahmedabad*

Ahmedabad University - Foundation Day 2019 — *2019*

For outstanding contributions to research. Presented on the 10^{th} foundation day of Ahmedabad University on February 26, 2019.

[6] DST-UKIERI Thematic Partnerships 2016-17 Research Award — *New Delhi*

British Council, New Delhi — *2017*

Under the Data Science Theme, awarded for the research partnership between Ahmedabad University and the University of Liverpool, UK, on April 7, 2017.

[7] Best IEEE Signal Processing Society Chapter Award — *Gujarat Section*

IEEE Region 10 (Asia) — *2016*

As Executive Committee Member-Treasurer, Gujarat Section, across Asia R10 Region.

[8] Best IEEE Signal Processing Society Chapter Award — *Gujarat Section*

IEEE Region 10 (Asia) — *2015*

As Executive Committee Member-Treasurer, Gujarat Section, across Asia R10 Region.

[9] Elite Gold Medal — *India*

IIT Kanpur - NPTEL MOOC — *2015*

Achieved outstanding performance with 91% in the NPTEL MOOC Certification offered by IIT Kanpur on Principles of Modern CDMA/MIMO/OFDM Wireless Communications.

[10] Second Prize - Best Presentation Award — *Surat*

TEQIP-II Workshop at NIT Surat — *2014*

Presented "Nonparametric Sensing using GoF Technique" during the TEQIP-II workshop on Mathematical Modeling for Scientists, Engineers, and Statisticians, January 27-31, 2014.

[11] Research Fellowship — *Ahmedabad*

Nirma University — *2011*

Awarded for 2011-2014 as a Full-Time Research Scholar in the Department of Electrical Engineering, Institute of Technology, Nirma University.

[12] First Prize in Research Paper Presentation — *Vadodara*

WTAC 2010 at IETE Baroda Center — *2010*

Research paper presented on Wireless Technologies in Automation and Communication, January 10, 2010.

[13] Appreciation Certificate - Coordinator for National Level Workshop — *Gujarat*

CIT, Changa — *2009*

Successfully organized a National Level Workshop on Wired and Wireless Network on NS-2 under FEDORA Linux Platform from March 19-21, 2009. This was the first hands-on workshop at the West India level in collaboration with IIT Bombay and DA-IICT, Gandhinagar.

[14] First Prize in Review Paper Section — *Vadodara*

IETE Baroda Center — *2008*

Presented on Networking Technology and Applications, April 20, 2008.

Research Publications

Journal Articles (IEEE Transactions or IET/Springer) [22]

2025

[J24] H. Shah, Dhaval K. Patel and V. Thummar, *On the performance of NOMA in RIS-enabled vehicular communications with CEE and SIC errors*, **Elsevier AEÜ - International Journal of Electronics and Communications**, vol. XXX, p. 155-693, 2025. [Online]. Available: https://doi.org/10.1016/j.aeue.2025.155693. [Accepted for publications].

2025

[J23] H. Shah, Dhaval K. Patel and V. Thummar, S. Sun and Z. Ding , *Performance Analysis of RIS-assisted 6G Vehicular Networks with NOMA under Diverse Channel Conditions*, **Springer Wireless Networks**, January 2025, [Accepted for publications].

2024

[J21] A. Oza, Dhaval K. Patel and B. J. Ranger, *Fusion ConvLSTM-Net: Using Spatiotemporal Features to Increase Residential Load Forecast Horizon*, in **IEEE Access**, vol. 13, pp. 12190-12202, 2025, doi: 10.1109/ACCESS.2025.3528072

2024

[J21] K. S. Joshi, Dhaval K. Patel, S. Thakker, M. López-Benítez and J. J. Lehtomäki, *Influence of Red Blood Cells on Channel Characterization in Cylindrical Vasculature*, in **IEEE Transactions on NanoBioscience**, August 2024 [Early Access Article] doi: 10.1109/TNB.2024.3436022.

2023

[J20] K. D. Shah, Dhaval K. Patel, M. P. Thaker, H. A. Patel, M. J. Saikia and B. J. Ranger, *EMED-UNet: An Efficient Multi-Encoder-Decoder Based UNet for Medical Image Segmentation*, in **IEEE Access**, vol. 11, pp. 95253-95266, 2023, doi: 10.1109/ACCESS.2023.3309158.

2023

[J19] Y. Kakkad, Dhaval K. Patel, S. Sun and M. Lopez-Benitez, *Optimal 3GPP Fairness Parameters in 5G NR Unlicensed (NR-U) and Wi-Fi Coexistence*, in **IEEE Transactions on Vehicular Technology**, vol. 72, no. 4, pp. 5373-5377, April 2023, doi: 10.1109/TVT.2022.3222964.

2023

[J18] Sagar Kavaiya, Dhaval K. Patel, Restricting passive attacks in 6G vehicular networks: a physical layer security perspective. **Springer Wireless Networks** 29, 1355-1365 (2023). https://doi.org/10.1007/s11276-022-03189-1.

2022

[J17] B. Soni, Dhaval K. Patel, S. B. Shah, M. Lopez-Benitez and S. Govindasamy, *PU-DetNet: Deep Unfolding Aided Smart Sensing Framework for Cognitive Radio*, in **IEEE Access**, vol. 10, pp. 98737-98751, 2022, doi: 10.1109/ACCESS.2022.3206814.

2022

[J16] B. Soni, Dhaval K. Patel, S. Kavaiya, Z. Ding, Y. L. Guan and S. Sun, *On Sensing Performance of Multi-Antenna Mobile Cognitive Radio Conditioned on Primary User Activity Statistics*, in **IEEE Transactions on Wireless Communications**, vol. 21, no. 5, pp. 3381-3394, May 2022, doi: 10.1109/TWC.2021.3121130.

2022

[J15] Dhaval K. Patel, S. Kavaiya, Z. Ding, Y. L. Guan and S. Sun, *Impact of Primary User Activity Statistics in Cognitive Vehicular Networks*, in **IEEE Transactions on Vehicular Technology**, vol. 71, no. 3, pp. 2859-2873, March 2022, doi: 10.1109/TVT.2021.3138253.

2021

[J14] Dhaval K. Patel, Hetal Shah, Z. Ding, Y. L. Guan and S. Sun, *Performance Analysis of NOMA in Vehicular Communications over i.n.i.d Nakagami—m Fading Channels*, in **IEEE Transactions on Wireless Communications**, doi: 10.1109/TWC.2021.3073050.

2020

[J13] S. Kavaiya, Dhaval K. Patel, Z. Ding, Y. L. Guan and S. Sun, *Physical Layer Security in Cognitive Vehicular Networks*, in **IEEE Transactions on Communications**, vol. 69, no. 4, pp. 2557-2569, April 2021, doi: 10.1109/TCOMM.2020.3038904.

2020

[J12] Dhaval K. Patel, M. Lopez-Benitez, B. Soni, and A. F. Garcia-Fernandez, *Artificial Neural Network Design for Improved Spectrum Sensing in Cognitive Radio*, **Springer Wireless Networks**, vol. 26, no. 8, pp. 6155-6174, 2020.

2020

[J11] Brijesh Soni, Dhaval K. Patel, and M. Lopez-Benitez, *Long Short-Term Memory based Spectrum Sensing Scheme for Cognitive Radio using Primary Activity Statistics*, **IEEE Access**, vol. 8, pp. 97437-97451, May 2020, doi: 10.1109/ACCESS.2020.2995633.

2020

[J10] Sagar Kavaiya, Dhaval K. Patel, Y. L. Guan, S. Sun, Y. C. Chang and J. M. Lim, *On the Energy Detection Performance of Multiantenna Correlated Receiver for Vehicular Communication using MGF Approach*, **IET Communications**, vol. 14, pp. 1858-1868, July 2020, DOI: 10.1049/iet-com.2019.1285.

2020

[J9] O. H. Toma, M. Lopez-Benitez, Dhaval K. Patel and K. Umebayashi, *Estimation of Primary Channel Activity Statistics in Cognitive Radio Based on Imperfect Spectrum Sensing*, **IEEE Transactions on Communications**, vol. 68, no. 4, pp. 2016-2031, April 2020, doi: 10.1109/TCOMM.2020.2965944.

2019

[J8] Dhaval K. Patel, Brijesh Soni, and M. Lopez-Benitez, *Improved likelihood ratio statistic based cooperative spectrum sensing for cognitive radio*, **IET Communications**, pp. 1-12, Dec. 2019, doi: 10.1049/iet-com.2019.0862.

2019

[J7] Dhaval K. Patel, Brijesh Soni, and M. Lopez-Benitez, *On the estimation of primary user activity statistics for long and short time scale models in cognitive radio*, **Springer Wireless Networks**, pp. 1-13, August 2019.

2019

[J6] Sagar Kavaiya, Dhaval K. Patel, Yong Liang Guan, Sumei Sun, Yoong Choon Chang and Joanne Mun-Yee Lim, *On the Energy Detection Performance of Arbitrarily Correlated Dual Antenna Receiver for Vehicular Communication*, **IEEE Communication Letters**, vol. 23, no. 7, pp. 1186-1189, July 2019, doi: 10.1109/LCOMM.2019.2916317.

2019

[J5] M. Lopez-Benitez, A. Al-Tahmeesschi, Dhaval K. Patel, J. Lehtomäki and K. Umebayashi, *Estimation of Primary Channel Activity Statistics in Cognitive Radio Based on Periodic Spectrum Sensing Observations*, **IEEE Transactions on Wireless Communications**, vol. 18, no. 2, pp. 983-996, Feb. 2019, doi: 10.1109/TWC.2018.2887258.

2018

[J4] Ahmed Al-Tahmeesschi, M. Lopez-Benitez, Dhaval K. Patel, Janne Lehtomäki and Kenta Umbayashi, *On the Sample Size for the Estimation of Primary Activity Statistics Based on Spectrum Sensing*, **IEEE Transactions on Cognitive Communication and Networking**, vol. 5, no. 1, pp. 59-72, March 2019, doi: 10.1109/TCCN.2018.2874456.

2018

[J3] Ahmed Al-Tahmeesschi, M. Lopez-Benitez, Valerio Selis, Dhaval K. Patel and Kenta Umbayashi, *Cooperative Estimation of Primary Traffic under Imperfect Spectrum Sensing and Byzantine Attacks*, **IEEE Access**, vol. 6, pp. 61651-61664, 2018, doi: 10.1109/ACCESS.2018.2876223.

2015

[J2] Dhaval K. Patel and Y. N. Trivedi, *Goodness-of-fit-based non-parametric spectrum sensing under Middleton noise for cognitive radio*, **IET Electronics Letters**, vol. 51, no. 5, pp. 419-421, March 2015.

2015

[J1] Dhaval K. Patel and Y. N. Trivedi, *Non-parametric Blind Spectrum Sensing based on Censored Observations for Cognitive Radio*, **Springer Journal of Signal Processing Systems**, vol. 78, no. 3, pp. 275-281, March 2015.

International Conference/Workshop Articles

2025

[C53] R. Moliya, Dhaval K. Patel, M. López-Benítez and A. Fakhreddine, "Optimizing UAV Deployment for Enhanced Detection Performance in Multi-UAV Cooperative Sensing," IEEE 31st National Conference on Communications **(NCC-2025)**, IIT - Delhi, India, 2025. **[Accepted as full paper for presentation]**

2025

[C52] D. Premani and Dhaval K. Patel, "Optimizing Sum Rate in RIS-Aided Multi-User MISO Systems With Curiosity-Driven Learning," IEEE 31st National Conference on Communications **(NCC-2025)**, IIT - Delhi, India, 2025. **[Accepted as full paper for presentation]**

2025

[C51] P. Patel and Dhaval K. Patel, "Capacity Analysis of Vehicular Networks in a Multi-User Mixed Traffic Scenario," IEEE 31st National Conference on Communications **(NCC-2025)**, IIT - Delhi, India, 2025. **[Accepted as full paper for presentation]**

2025

[C50] P. Patel, Dhaval K. Patel, "Smart Sensing Framework Using Kolmogorov-Arnold Networks for Enhanced Detection in 5G Environments," 2025 17th International Conference on COMmunication Systems & NETworkS **(COMSNETS 2025)**, Bengaluru, India, 2025. **[Received Best Paper Award]**

2025

[C49] K. Kanzariya, Dhaval K. Patel, "Optimized UAV Trajectory Design within Multi-Charging Station Scenario in the ISAC Framework," 2025 17th International Conference on COMmunication Systems & NETworkS **(COMSNETS 2025)**, Bengaluru, India, 2025. **[Accepted for presentation @Chancery Pavilion, Bengaluru, Karnataka, India during Jan 6-10, 2025]**

2025

[C48] A. Patel, Dhaval K. Patel, "Improving VR Performance in WiFi-6 using Deep Reinforcement Learning based Spatial Reuse," 2025 17th International Conference on COMmunication Systems & NETworkS **(COMSNETS 2025)**, Bengaluru, India, 2025 **[Accepted for presentation @Chancery Pavilion, Bengaluru, Karnataka, India during Jan 6-10, 2025]**

2025

[C47] R. Dave, Dhaval K. Patel, "Efficient Human Activity Recognition using Deep Unfolding in 802.11bf Wi-Fi Sensing," 2025 17th International Conference on COMmunication Systems & NETworkS **(COMSNETS 2025)**, Bengaluru, India, 2025. **[Accepted for presentation @Chancery Pavilion, Bengaluru, Karnataka, India during Jan 6-10, 2025]**

2024

[C46] S. Thakker, Dhaval K. Patel, K. Kalaria, M. López-Benítez and J. J. Lehtomäki, "Modeling of Cognitive Mobile Molecular Communication in a Biological Microfluidic Cylindrical Channel," 2024 IEEE Region 10 Symposium **(TENSYMP 2024)**, New Delhi, India, 2024, pp. 1-6, doi: 10.1109/TENSYMP61132.2024.10752153.

2024

[C45] O. B. Makadia, Dhaval K. Patel, Mehul S. Raval, Mukesh Zaveri, and Shabbir N. Merchant, "Enhancing 6G mmWave Beam Prediction in V2I with Class Imbalance Mitigation," 2024 IEEE 35th International Symposium on Personal, Indoor and Mobile Radio Communications **(PIMRC-2024)**, Valencia, Spain. [Accepted and Presented at the conference held on September 2-5, 2024]

2024

[C44] Sagar Bajaj, Dhaval K. Patel, Mehul S. Raval, Mukesh Zaveri, and Shabbir N. Merchant, "VisionReli6G: Enhancing 6G Wireless Reliability with CNN-LSTM for LOS Blockage Prediction," in 2024 ACM Proceedings of the 16th International Conference on Contemporary Computing **(IC3-2024)**, Noida-India, pp. 675 - 681, doi:10.1145/3675888.3676130

2024

[C43] K. D. Shah, Dhaval K. Patel, M. S. Raval, M. Zaveri, and S. N. Merchant, "Deep RL-Based Smart Signaling Using Space-Time Vehicular Features Under C-V2X Scenario," 2024 16th International Conference on COMmunication Systems & NETworkS **(COMSNETS 2024)** - Workshop on Intelligent Transportation Systems (ITS), Bengaluru, India, 2024, pp. 240-245, doi: 10.1109/COMSNETS59351.2024.10427232.

2024

[C42] O. B. Makadia, Dhaval K. Patel, K. D. Shah, M. S. Raval, M. Zaveri, and S. N. Merchant, "Millimeter-Wave Vehicle-to-Infrastructure Communications for Autonomous Vehicles: Location-Aided Beam Forecasting in 6G," 2024 16th International Conference on COMmunication Systems & NETworkS **(COMSNETS 2024)** - Workshop on Connected Vehicles & Autonomous Driving (CVAD), Bengaluru, India, 2024, pp. 1100-1105, doi: 10.1109/COMSNETS59351.2024.10427300.

2023

[C41] H. R. Nagrani, Dhaval K. Patel, K. D. Shah, H. A. Patel, and M. J. Saikia, "Facial Expression Recognition using Convolutional Neural Network through Region-based Patch Generation: Harnessing Subtle Facial Cues," 2023 International Conference on Machine Learning and Applications **(ICMLA 2023)**, Jacksonville, FL, USA, 2023, pp. 973-979, doi: 10.1109/ICMLA58977.2023.00144.

2023

[C40] B. Soni, S. Govindasamy, and Dhaval K. Patel, "Rate Forecaster based Energy Aware Band Assignment in Multiband Networks," **GLOBECOM 2023** - 2023 IEEE Global Communications Conference, Kuala Lumpur, Malaysia, 2023, pp. 6723-6728, doi: 10.1109/GLOBECOM54140.2023.10437500.

2023

[C39] F. N. Shah, Dhaval K. Patel, K. D. Shah, M. S. Raval, M. Zaveri, and S. N. Merchant, *Novel Crash Prevention Framework for C-V2X using Deep Learning*, in 2023 IEEE 15th International Conference on COMmunication Systems and NETworkS **(COMSNETS 2023)** - Workshop on Connected Vehicles & Autonomous Driving (CVAD), Bangalore, India, 2023, pp. 7-12, doi: 10.1109/COMSNETS56262.2023.10041397.
[Received Best Paper Award]

2023

[C38] S. Kavaiya, Dhaval K. Patel, M. S. Raval, M. Zaveri, and S. N. Merchant, *VeCEn: A Data Acquisition Framework for Heterogeneous Vehicular Networks* in IEEE 15th International Conference on COMmunication Systems and NETworkS **(COMSNETS 2023)** - CVAD Workshop.

2023

[C37] B. Soni, S. Govindasamy, and Dhaval K. Patel, "Deep Learning aided Energy Efficient Band Assignment in Multiband Heterogeneous Networks," 2023 IEEE 20th Consumer Communications & Networking Conference **(CCNC)**, Las Vegas, NV, USA, 2023, pp. 690-691, doi: 10.1109/CCNC51644.2023.10060279.

2022

[C36] K. D. Shah, Dhaval K. Patel, H. A. Patel, and H. R. Nagrani, *EMED-UNet: An Efficient Multi-Encoder-Decoder Based UNet for Chest X-ray Segmentation*, IEEE Region 10 Symposium **(TENSYMP 2022)**, July 2022, pp. 1-6, doi: 10.1109/TENSYMP54529.2022.9864556.

2022

[C35] V. Thakore, Dhaval K. Patel, and M. Lopez-Benitez, *Prognosis of Infection Spread Deploying Internet of Bio-NanoThings*, IEEE Region 10 Symposium **(TENSYMP 2022)**, July 2022, pp. 1-6, doi: 10.1109/TENSYMP54529.2022.9864459.

2022

[C34] H. A. Patel, Dhaval K. Patel, K. D. Shah, and H. R. Nagrani, *SplitGlass: A Splitting Based Deep Network for Efficient Human Pose Estimation*, in IEEE Region 10 Symposium **(TENSYMP 2022)**, July 2022, pp. 1-6, doi: 10.1109/TENSYMP54529.2022.9864481.

2022

[C33] S. Thakker, Dhaval K. Patel, K. S. Joshi, and M. Lopez-Benitez, *Modelling the Impact of Multiple Pro-inflammatory Cytokines Using Molecular Communication*, in IEEE 28th National Conference on Communications **(NCC 2022)**, May 2022, pp. 291-296, doi: 10.1109/NCC55593.2022.9806804.

2022

[C32] S. Kavaiya and Dhaval K. Patel, *On the Performance of an Improved Energy Detector over Shadow Fading Channels for Vehicular Networks* in IEEE 14th International Conference on COMmunication Systems and NETworkS **(COMSNETS 2022)**, January 3-8, 2022, pp. 275-279, doi: 10.1109/COMSNETS53615.2022.9668367.

2021

[C31] S. Shah, Dhaval K. Patel, B. Soni, M. Lopez-Benitez, and S. Kavaiya, *Impact of Mobility on the Estimation of Primary Channel Activity Statistics* in IEEE 94th Vehicular Technology Conference **(VTC-Fall 2021)**, September 27-30, 2021, pp. 1-5, doi: 10.1109/VTC2021-Fall52928.2021.9625533.

2021

[C30] S. Shah, Dhaval K. Patel, B. Soni, M. Lopez-Benitez, and S. Kavaiya, *Weighted Cooperative Spectrum Sensing for Cognitive Vehicular Networks* in IEEE 94th Vehicular Technology Conference **(VTC-Fall 2021)**, September 27-30, 2021, pp. 1-5, doi: 10.1109/VTC2021-Fall52928.2021.9625533.

2021

[C29] B. Soni, Dhaval K. Patel, S. Kavaiya, M. O. Hasna, and M. Lopez-Benitez, *On Physical Layer Security of Correlated Multiantenna Cognitive Radio Receivers* in IEEE 27th National Conference on Communications at IIT-Kanpur **(NCC 2021)**, July 27-30, 2021, pp. 1-6, doi: 10.1109/NCC52529.2021.9530195.

2021

[C28] S. Kavaiya, Dhaval K. Patel, Y. L. Guan, S. Sun, Y. C. Chang, and J. M.-Y. Lim, *Distributed Spectrum Sensing for Cognitive Vehicular Networks using Quasi-Newton Optimization*, in IEEE 13th International Conference on COMmunication Systems and NETworkS **(COMSNETS 2021)**, January 5-9, 2021 at Bengaluru, India.

2021

[C27] Bhargav P. Patel, Dhaval K. Patel, B. Soni, M. Lopez-Benitez, and S. Kavaiya, *LSTM Autoencoder aided Estimation of Primary Activity Statistics under Imperfect Sensing*, in IEEE 13th International Conference on COMmunication Systems and NETworkS **(COMSNETS 2021)**, January 5-9, 2021 at Bengaluru, India. [Accepted for publication]

2020

[C26] Dhaval K. Patel, B. Soni, Y. L. Guan, S. Sun, Y. C. Chang, and J. M.-Y. Lim, *Performance Analysis of Arbitrary Correlated Multiantenna Receiver for Mobile Cognitive User*, in IEEE Global Communications Conference **(GLOBECOM 2020)**, December 2020, Taipei, Taiwan. [Accepted for publication].

2020

[C25] Shweta Thakur, Dhaval K. Patel, Brijesh Soni, Mehul Raval, and Sanjay Chaudhary, *Prediction for the Second Wave of COVID-19 in India*, Springer Eighth International Conference on Big Data Analytics **(BDA 2020)**, December 15-18, 2020, Ashoka University, Sonipat, India. [Accepted for publication].

2020

[C24] O. H. Toma, M. López-Benítez, and Dhaval K. Patel, *Analysis of the Sample Size Required for an Accurate Estimation of Primary Channel Activity Statistics Under Imperfect Spectrum Sensing*, in IEEE 31st Annual International Symposium on Personal, Indoor and Mobile Radio Communications **(PIMRC 2020)**, 2020, pp. 1-6.

2020

[C23] S. Kavaiya, Dhaval K. Patel, Y. L. Guan, S. Sun, Y. C. Chang, and J. M.-Y. Lim, *On Physical Layer Security Over* $\alpha - \eta - \kappa - \mu$ *Fading for Relay-Based Vehicular Networks*, in International Conference on Signal Processing and Communications **(SPCOM 2020)**, IISc Bangalore, 2020, pp. 1-5.

2020

[C22] O. H. Toma, M. López-Benítez, Dhaval K. Patel, and K. Umebayashi, *Reconstruction Algorithm for Primary Channel Statistics Estimation Under Imperfect Spectrum Sensing*, Proceedings of the 18th IEEE Wireless Communications and Networking Conference **(WCNC 2020)**, pp. 1-5, May 25-28, 2020.

2020

[C21] O. H. Toma, M. López-Benítez, Dhaval K. Patel, and K. Umebayashi, *Methods for Fast Estimation of Primary Activity Statistics in Cognitive Radio Systems*, Proceedings of the 18th IEEE Wireless Communications and Networking Conference **(WCNC 2020)**, pp. 1-5, May 25-28, 2020.

2020

[C20] M. López-Benítez, O. H. Toma, Dhaval K. Patel, and K. Umebayashi, *Sample Size Analysis of Energy Detection Under Fading Channels*, Proceedings of the 6th IEEE WCNC International Workshop on Smart Spectrum **(IWSS 2020)**, pp. 1-6, May 25-28, 2020.

2020

[C19] M. López-Benítez, O. H. Toma, and Dhaval K. Patel, *Mathematical Models for the Accuracy of the Estimated Distribution of Primary Activity Times in DSA*, Proceedings of the 6th IEEE WCNC International Workshop on Smart Spectrum **(IWSS 2020)**, pp. 1-5, May 25-28, 2020.

2020

[C18] Brijesh Soni, Dhaval K. Patel, Y. L. Guan, S. Sun, Y. C. Chang, and J. M.-Y. Lim, *Performance Analysis of NOMA Aided Cooperative Relaying Over* α-η-κ-μ *Fading Channels*, Proceedings of the Twenty-Sixth National Conference on Communications **(NCC 2020)**, IIT Kharagpur, 2020, pp. 1-6.

2019

[C17] O. H. Toma, M. López-Benítez, Dhaval K. Patel, and K. Umebayashi, *Primary Channel Duty Cycle Estimation Under Imperfect Spectrum Sensing Based on Mean Channel Periods*, in 38th IEEE Global Communications Conference **(GLOBECOM 2019)**, Waikoloa, USA, pp. 1-6, December 2019.

2020

[C16] J. M. Lim, Y. C. Chang, and Dhaval K. Patel, *Cognitive Intelligence With Adaptive MAC Vehicular Ad-Hoc Network Optimization*, 2020 International Conference on Artificial Intelligence in Information and Communication **(ICAIIC 2020)**, Fukuoka, Japan, pp. 098-102, February 19-21, 2020. doi:10.1109/ICAIIC48513.2020.9065283.

2019

[C15] Nikhil Balwani, Dhaval K. Patel, Brijesh Soni, and M. López-Benítez, *Long Short-Term Memory Based Spectrum Sensing Scheme for Cognitive Radio*, Proceedings of the 30th IEEE International Symposium on Personal, Indoor and Mobile Radio Communications **(PIMRC 2019)**, Turkey, pp. xx-xx, September 8, 2019.

2019

[C14] Bansi Gajera, Dhaval K. Patel, Brijesh Soni, and M. López-Benítez, *Performance Evaluation of Improved Energy Detection Under Signal and Noise Uncertainties in Cognitive Radio Networks*, Proceedings of the 3rd IEEE International Conference on Signals and Systems **(ICSigSys 2019)**, Bandung, Indonesia, pp. xx-xx, July 16-18, 2019.

2019

[C13] Om Thakkar, Dhaval K. Patel, Y. L. Guan, S. Sun, Y. C. Chang, and J. M.-Y. Lim, *On the Joint Impact of SU Mobility and PU Activity in Cognitive Vehicular Networks With Improved Energy Detection*, Proceedings of the IEEE 89th Vehicular Technology Conference **(VTC 2019 Spring)**, Kuala Lumpur, Malaysia, pp. xx-xx, April 28-May 1, 2019.

2019

[C12] M. López-Benítez and Dhaval K. Patel, *Sigmoid Approximation to the Gaussian Q-function and Its Applications to Spectrum Sensing Analysis*, Proceedings of the 17th IEEE Wireless Communications and Networking Conference **(WCNC 2019)**, Marrakech, Morocco, pp. xx-xx, April 15-19, 2019.

2019

[C11] M. López-Benítez, Janne Lehtomäki, Kenta Umebayashi, and Dhaval K. Patel, *Accurate Noise Floor Calibration Based on Modified Expectation Maximisation of Gaussian Mixture*, Proceedings of the 17th IEEE Wireless Communications and Networking Conference **(WCNC 2019)**, Marrakech, Morocco, pp. xx-xx, April 15-19, 2019.

2019

[C10] Bansi Gajera, Dhaval K. Patel, Brijesh Soni, and M. López-Benítez, *Experimental Performance Evaluation of Improved Energy Detection Under Noise Uncertainty in Low SNR Regime*, Proceedings of the 5th IEEE WCNC International Workshop on Smart Spectrum **(IWSS 2019)**, Marrakech, Morocco, pp. xx-xx, April 15-19, 2019.

2018

[C9] Shivam Raval, Dhaval K. Patel, and Miguel López-Benítez, *Performance Analysis of Improved Energy Detection in Full Duplex Non-Time-Slotted Cognitive Radio*, Proceedings of the IEEE 12^{th} International Conference on Advanced Networks and Telecommunications Systems **(ANTS 2018)**, Indore, India, pp. xx-xx, December 16-19, 2018.

2018

[C8] Om Thakkar, Dhaval K. Patel, Shivam Raval, and Miguel López-Benítez, *Performance Analysis of Selection Diversity Combining Using Improved Energy Detection*, Proceedings of the IEEE 15^{th} India Council International Conference **(INDICON 2018)**, Coimbatore, India, pp. xx-xx, December 16-18, 2018.

2018

[C7] Kartik Patel, Dhaval K. Patel, Miguel López-Benítez, and S. Chaudhary, *Distribution-free Spectrum Sensing for Full Duplex Cognitive Radio*, Proceedings of the IEEE 88^{th} Vehicular Technology Conference **(VTC 2018 Fall)**, Chicago, USA, pp. 1-5, August 27-30, 2018.

2018

[C6] Miguel López-Benítez, A. Al-Tahmeesschi, and Dhaval K. Patel, *Accurate Estimation of the Minimum Primary Channel Activity Time in Cognitive Radio Based on Periodic Spectrum Sensing Observations*, Proceedings of the IEEE 15^{th} European Wireless Conference **(EW 2018)**, Catania, Italy, pp. 131-136, May 2-4, 2018.

2017

[C5] Maunil Vyas, Dhaval K. Patel, and Miguel López-Benítez, *Artificial Neural Network Based Hybrid Spectrum Sensing Scheme for Cognitive Radio*, submitted to IEEE 28^{th} Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communication **(PIMRC 2017)**, Montreal, Quebec, Canada, pp. 1-7, October 8-13, 2017.

2017

[C4] Mitul Panchal, Dhaval K. Patel, and Sanjay Chaudhary, *Spectrum Occupancy Classification Using SVM-Radial Basis Function*, submitted to Springer 12^{th} EAI International Conference on Cognitive Radio Oriented Wireless Networks **(CROWNCOM 2017)**, Lisbon, Portugal, pp. 112-127, September 20-21, 2017.

2016

[C3] Dhaval K. Patel and Y. N. Trivedi, *LRS-G^2 Based Non-Parametric Spectrum Sensing for Cognitive Radio*, Springer EAI 11^{th} International Conference on Cognitive Radio Oriented Wireless Networks **(CROWNCOM 2016)**, pp. 330-341, May 2016.

2011

[C2] Dhaval K. Patel, K. Patel, and M. Patel, *'Scalability Analysis in Wireless Sensor Network with LEACH Routing Protocol'*, IEEE International Conference **CAMAN-2011**, Wuhan, China, pp. 1-6, 2011.

2010

[C1] Dhaval K. Patel, S. K. Shah, and M. P. Thakar, *'Performance Analysis of Reactive Routing Protocols with OSPF for IEEE 802.11s Wireless Mesh Network'*, Springer Berlin Heidelberg - Series Communications in Computer and Information Science, vol. 70, pp. 276-280, January 2010.

Workshop / Conference / Training Programmes Organised @SEAS-AU

[1] 18th IEEE International Conference on Vehicular Electronics and Safety (ICVES)

Ahmedabad University

IEEE ICVES International Conference - Finance Chair

December 16-19, 2024

It was held in Ahmedabad, India, providing a global forum for researchers and practitioners to discuss advancements in vehicle electronics and safety. Sponsored by the IEEE Intelligent Transportation Systems Society, the conference featured a diverse array of sessions. Topics included blockchain applications in vehicular networks, enhancements in underwater communication technologies, and innovative methods for crash prediction and vehicular control. Notable sessions focused on E-Vehicle systems and the integration of artificial intelligence for road safety. The event aimed to enhance discussions on safety, mobility, and environmental impacts associated with transportation.

[2] PTV-VSSIM Simulation tool: Urban Mobility

Ahmedabad University

ITS Cluster Workshop

April 29, 2022

This workshop focused on the use of the PTV-VSSIM simulation tool for understanding and optimizing urban mobility systems. It provided participants with practical insights into traffic simulation and analysis techniques.

- Overview of PTV-VSSIM software for traffic and mobility simulation.
- Techniques for modeling and analyzing urban mobility patterns.
- Practical demonstration of traffic flow management in the simulator.

[3] AI for Fight Against COVID-19 (AIAC-19)

Ahmedabad University

Virtual National Workshop

October 24, 2020

This national-level virtual workshop delved into the role of AI in addressing the challenges posed by the COVID-19 pandemic. It showcased innovative AI applications in healthcare and data analytics for pandemic management.

- Applications of AI in detecting and managing COVID-19 cases.
- Use of predictive analytics for pandemic forecasting.
- Case studies on AI-driven healthcare solutions.

[4] Machine Learning for xG Wireless Networks: Performance Analysis and Monte Carlo Simulations

Ahmedabad University

National Level FDP

June 10-15, 2019

This FDP offered an in-depth exploration of machine learning applications in next-generation wireless networks. Participants gained practical experience in using Monte Carlo simulations to evaluate network performance.

- Introduction to machine learning models for xG networks.
- Performance evaluation through Monte Carlo simulation techniques.
- Practical examples for wireless communication challenges.

[5] Learning Coalition Workshop

Ahmedabad University

AU Faculty Members Workshop

2018

Designed for Ahmedabad University faculty, this workshop emphasized innovative teaching methodologies and collaboration to enhance the learning experience.

- Development of innovative teaching strategies.
- Fostering collaboration among faculty members.
- Practical implementation of active learning techniques.

[6] Advanced 5G Wireless Communications: Performance Analysis and Monte-Carlo Simulations

Ahmedabad University

Faculty Development Program (FDP)

June 18-23, 2018

This FDP, conducted as part of DST-UKIERI and DST-ASEAN research projects, focused on the latest advancements in 5G wireless communication and performance analysis through Monte Carlo simulations.

- In-depth study of 5G communication technologies.
- Techniques for Monte Carlo simulations in wireless networks.
- Research insights from DST-UKIERI and DST-ASEAN projects.

[7] Advanced Wireless Communication using GNURADIO and USRP, [DST-UKIERI Project]

Ahmedabad University

Faculty Development Program (FDP)

August 16-20, 2017

This FDP emphasized the integration of GNURADIO and USRP hardware for understanding advanced wireless communication protocols. It included hands-on sessions to enhance practical learning.

- Hands-on experience with GNURADIO and USRP.
- Implementation of advanced communication protocols.
- Simulation and hardware integration in wireless communication.

[8] Introduction to Orthogonal Frequency Division Multiplexing *Olin School*

Workshop *December 26-30, 2016*

This workshop introduced participants to the fundamentals of Orthogonal Frequency Division Multiplexing (OFDM) and its role in modern wireless communication systems.

- Basics of OFDM and its importance in wireless systems.
- Signal processing techniques in OFDM systems.
- Practical applications in broadband communication.

Teaching (2023-2024)

[1] MAT 277 Probability and Stochastic Processes *B.Tech (CSE) Semester- 4*

Summary: Credits: 03, Total sessions: 30, No. of Hours: 45

This course provides an in-depth exploration of probability theory and its applications in various domains, with a focus on understanding random processes. Students will delve into fundamental concepts such as probability axioms, random variables, distributions, and inequalities.

[2] ECE 310 Wireless Communication *B.Tech (CSE) Semester- 5/7*

Summary: Credits: 03, Total sessions: 30, No. of Hours: 45.

This comprehensive course is designed to introduce participants to the fundamentals and advanced concepts of wireless communication, with a special emphasis on 5G technology and simulation techniques. It covers a broad spectrum of topics, from the basics of wireless communication systems to the intricacies of network simulations, performance analysis, and the latest wireless technologies.

[3] CSE 516 Probabilistic Graphical Models *B.Tech (CSE) Semester- 5/7*

Summary: Credits: 03, Total sessions: 30, No. of Hours: 45

This course will concentrate on three primary facets: A. The fundamental representation, encompassing Bayesian and Markov networks, along with dynamic Bayesian networks; B. Probabilistic inference algorithms, spanning both precise and approximate methods; and C. Learning techniques for the graphical models, parameters, and structure.

[4] CSE 400 Fundamentals of Probability and Computing *B.Tech (CSE) Semester- 4*

Summary: Credits: 03, Total sessions: 30, No. of Hours: 45

The Fundamentals of Probability and Computing is a subject aimed at teaching the fundamentals of probability and computing to model uncertainty in human daily life and learn how to apply the knowledge gained in the field of engineering, such as Communication, Networking and Computer Science, etc. through regular problem solving / coding based on applications of the concepts covered. The course also covers the analysis of algorithms with probabilistic bounds and introduces students to the fascinating realm of random graphs.

Teaching Innovations with an Interdisciplinary Approach

[1] Joint Teaching Experiment with MAT 277: Probability and Random Process and EPP-291: Economics: A joint project was carried out between the two courses. Students were encouraged to observe the links between MAT 277 and EPP-291 to learn about the interdisciplinary connections between social science and engineering. As part of the evaluation, students were expected to pick a problem of uncertainty in a nonengineering domain related to Economics and apply the subject knowledge to derive inferences by incorporating Probabilistic Modeling, Coding, and Inference Analysis. Students also benefited from sharing of common credit.

[2] Biology with Mathematical Modeling (MAT 277): A key objective of this course was how students can correlate a probability theory with their daily life and apply subject knowledge to model uncertainty with interdisciplinary fields like biology, which students have never studied. In addition, the course was designed to fill the gap and involve engineering students to apply their mathematics and coding skills to solve problems in the field of biology.

[3] Industry Interface: CSE-510: Advanced Wireless Communications: A new research-oriented laboratory course was designed based on instructor's Olin visit. A salient feature of this course were:

- Course Structure: 3 Credit and 6 Hours Laboratory Course
- Interdisciplinary Project Definition: Medical, Public Safety, Satellite Communication, CPS: Vehicular Communication (In context of Global Challenges)
- Evaluation Mechanism: Industry and Academic Experts together: Extension to Capstone Project Funding: 1. Space Application Center (SAC)- Indian Space Research Organization (ISRO) 2. Qualcomm
- Role of faculty as a coach and not as a evaluator to help students to find the unsolved problem and perform detailed mathematical analysis along with empirical setup.
- The project work has been evaluated by the scientist and engineer from the SAC-ISRO and QUALCOMM respectively.

Under Graduate Research Programme

The Undergraduate Research Programme (UGRP) at the university provides students with an invaluable opportunity to engage in research early in their academic journey. Beginning from Semester 4, undergraduate students are trained to develop a strong research mindset, working alongside faculty members in their research projects. The Machine Intelligence, Computing, and xg-Networks (MICxN) Lab, led by Professor Patel, serves as a key space where UGRP students explore cutting-edge research. This experience not only prepares students for graduate school but also offers exposure to a research-oriented career. Students have the opportunity to independently investigate pressing research problems while collaborating with foreign collaborators in their ongoing research efforts. For those interested, UGRP research can be continued as part of their BTech (CSE) Thesis 1 and 2.

UGRP - I (2017) Total Projects: 06 Students: 06
UGRP - II (2020) Total Projects: 11 Students: 21
UGRP - III (2021) Total Projects: 08 Students: 08
UGRP - IV (2022) Total Projects: 06 Students: 06
UGRP - V (2023) Total Projects: 05 Students: 08
UGRP - VI (2024) Total Projects: 04 Students: 06

Reviewer - International Journals

[1] IEEE Transactions on Wireless Communications

[2] IEEE Transactions on Cognitive Communications and Networking

[3] IEEE Access

[4] IEEE Transactions on Vehicular Technology

[5] IEEE Communication Letters

[6] Computer Networks

[7] Springer Nature

[8] Springer Wireless Network

Administrative Duties at SEAS-AU

- Designing the new Programme Curriculum of BTech in Computer Science and Engineering.

- Executive Chairman of AU Library Committee.

- IEEE Student Branch Counsellor - Ahmedabad University: Major events: DL Talk, Coordinator - Sampark 2016.

- Major Advisor - B.Tech (CSE), Member at M.Tech Admissions Committee.

- PG Coordinator: Conducting M.Tech Dissertation / Progress Seminars / Exams.

- Executive Committee member (Treasurer), IEEE Signal Processing Society - Gujarat Section.

- Invited as Expert member of Board of Study (BoS) at B.V.M College of Engineering and Technology, Sardar Patel University, V.V. Nagar, Guj.

- Finance Chair for organizing NeTSip-2015 (National Seminar on Recent Trends in Signal Processing) at DA-IICT on 3-4 October, 2015.

Computer Skills

Basic C, Assembly Language -8085/8051, Adobe Illustrator/Professional
Intermediate Qualnet 5, NS 2.33 (Network Simulator), Tcl/Otcl, Multisim, OpenOffice, Linux, Microsoft Windows, Keil IDE Cross compiler
Advanced Mendly Desktop, LaTeX, MATLAB, R, Python

Training Programs Completed

A National Workshop on Applied Deep Learning — *IIT Mandi, Himachal Pradesh*
MANAS Group, IIT Mandi — *July 1-5, 2019*

A Short Course on "Signal Processing for 5G Massive MIMO Wireless Systems" — *IIT Kanpur*
IIT Kanpur — *January 28-30, 2017*

NPTEL Certification MOOC Course on Principles of MIMO and CDMA Communications — *IIT, Kanpur*
IIT Kanpur — *2015*
Completed a 6-week NPTEL Certification MOOC Course on "Principles of MIMO and CDMA Communications" offered by IIT Kanpur.

TEQIP-II Sponsored STTP on Mathematical, Statistical, and Operation Research Based Modeling and Simulation for Researchers, Engineers, and Scientists — *NIT Surat*
NIT Surat — *2014*

Cognitive Radio: The Next Frontier in Wireless Communication — *IIT Kanpur*
BSNL-IITK Telecom Center of Excellence — *2012*
Completed a 3-day course under BSNL-IITK Telecom Center of Excellence at the EE Department, IIT Kanpur.

Workshop on Introduction to Research Methodologies — *LDRP, Gandhinagar [via Video Conference from IIT Bombay]*
ISTE-IIT Bombay — *2012*
Participated in a 2-week ISTE workshop on "Introduction to Research Methodologies."

STTP on Performance of MIMO-Wireless Communications — *Nirma University, Ahmedabad*
Institute of Technology, Nirma University — *2011*

MHRD/AICTE Sponsored Faculty Development Programme, Wireless Ad-Hoc and Sensor Network — *IIT Kharagpur*
IIT Kharagpur — *2010*
Completed a 3-week Faculty Development Programme.

Digital Image Processing: Remote Sensing Perspectives — *CIT, Changa*
CIT, Changa — *2010*
Attended a 1-week National Level Short-Term Course under SPACETECH-ISRO Consultant and IETE.

Emerging Trends in Wireless Communication — *HBTI, Kanpur*
Harcourt Butler Technological Institute, Kanpur — *2009*
Participated in a 1-week Faculty Development Programme under TEQIP, World Bank Project, Govt. of India.

STTP on Embedded System Design Based on ARM Processor — *Nirma University, Ahmedabad*
Nirma University, Ahmedabad — *2009*

State-Level STTP on Mobile Computing and Security — *S.P.C.E., Visnagar*
S.P.C.E., Visnagar — *2007*

State-Level STTP on Real-Time Application Development Using Digital Signal Processors and FPGAs — *S.P.C.E., Visnagar*
S.P.C.E., Visnagar — *2007*

Invited Talks

Mobile Communication Standards: 5G/6G and Future Wireless Standards
Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), Space Application Center, ISRO, Ahmedabad. — *September 19, 2024*
This talk explores the advancements in 5G and emerging 6G wireless standards, focusing on their transformative impact on connectivity, speed, and network reliability. It highlights key technologies driving the future of wireless communication, such as AI integration, massive MIMO, and terahertz frequencies.

Artificial Intelligence in Intelligent Transportation Systems

IEEE Gujarat Section STEP Talk, Sarvajanik College of Engineering and Technology, Surat, Gujarat *April 2024*

This talk delves into the role of Artificial Intelligence (AI) in transforming Intelligent Transportation Systems (ITS). It covers how AI technologies such as machine learning, computer vision, and more are enhancing traffic management, safety, and efficiency in modern ITS.

Machine Learning for xG Networks

Silver Oak University IEEE SPS Student Branch Chapter (IEEE SPS Day Celebration) *June 9, 2023*

This talk explores the application of Machine Learning (ML) techniques in the optimization and performance analysis of xG wireless networks. It highlights how ML algorithms can be used to enhance network efficiency, manage traffic, and improve resource allocation in emerging next-generation networks like 5G and beyond.

Future Mobile Communication Standards (5G/6G): Introduction, Research Projects and Performance Analysis of xG Networks

Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), Affiliated to the United Nations *October 6, 2022*

Achieved outstanding performance with 91% in the NPTEL MOOC Certification offered by IIT Kanpur on Principles of Modern CDMA/MIMO/OFDM Wireless Communications.

A Next Generation 5G Wireless Revolution with Data Analytics

LML School, Ahmedabad *July 26, 2022*

Delivered an expert talk at LML School, Ahmedabad on "A Next Generation 5G Wireless Revolution with Data Analytics."

Vehicular Cyber Physical System and Intelligent Transportation System

CQUAD, Institute of Technology, Nirma University *July 14, 2022*

Invited as an expert resource person to deliver a session on "Vehicular Cyber Physical System and Intelligent Transportation System."

5G: Green Communication Networks Deployment in Smart Cities

Acharya Institute of Technology, Bangalore *January 18-22, 2021*

Invited expert talk for AICTE ATAL FDP on "5G: Green Communication Networks Deployment in Smart Cities."

Internet of Medical Things (IoMT): Architecture, Open Research Issues and Challenges

G H Patel College of Engineering and Technology (GCET), CVM University, Vallabh Vidyanagar *January 2021*

Invited expert talk in AICTE ATAL Online FDP on "Internet of Things."

Internet of Medical Things (IoMT): Architecture, Open Research Issues and Challenges

Virtual National Workshop *October 24, 2020*

One-Day Virtual National Workshop on AI for Fight Against COVID-19 (AIAC-19).

Communication Networks - Physical Layer Security

Geethanjali College of Engineering and Technology, Hyderabad *August 18, 2020*

AICTE approved National Workshop on Communication Networks - Physical Layer Security.

Introduction to Miro: Case Study

Online *July 28, 2020*

One-Day Learning Coalition on "Online Teaching - Introduction to Miro: Case Study."

Progress Summary on Cognitive Radio Enabled Vehicular Cyber Physical System for Urban Area

Nanyang Technological University, Singapore *February 14, 2019*

New Paradigm for xG Wireless Network: Modeling of Physical Layer Using Expert System

University of Liverpool, UK *December 17, 2018*

Future Research Opportunities in xG Wireless Network

Faculty of Technology DDIT - Dharamsinh Desai University *November 11, 2018*

Performance Analysis of SIMO Wireless System

University of Liverpool, UK *December 2017*

Performance Analysis of SIMO Wireless System and Applications

L.D College of Engineering, Ahmedabad *April 12, 2017*

Advance Communication Techniques

Government College of Engineering, Gandhinagar — *March 23-24, 2017*

Probabilistic Models in R

Gujarat Vidyapeeth, Ahmedabad — *February 17, 2016*

MIMO Space Time Block Code: Performance Analysis

Indus University — *2015*

Spectrum Sensing Algorithms and Performance Analysis of Energy Detection

G. H. Patel College of Engineering, V.V. Nagar — *May 19-25, 2014*

Non-parametric Spectrum Sensing in Cognitive Radio

Institute of Technology, Nirma University — *November 27, 2013*

Opportunistic Spectrum Access Using Cognitive Radio: Femtocell Application with LTE Advanced

IE-IETE Auditorium, Vadodara — *2013*

Open Source Platforms for Simulation of Data Communication and Networks

Babaria Institute of Technology (BIT), Vadodara — *March 16, 2013*

Performance Analysis of Space Time Block Coding

LCIT, Bhandu — *2012*

National Workshop-2012 on "Performance Analysis of Space Time Block Coding."

Cognitive Radio in xG Wireless Communication

IE-IETE Regional Seminar, Vadodara — *2012*

Simulation Framework for MANET Routing Protocols in Qualnet

IETE National Seminar, Vadodara — *2010*

8051 Microcontroller Based Robotics Design - Case Study

ASE Club, Department of Mechanical Engineering, CIT, Changa — *2009*

Role of Linux in Embedded Systems

Linux User Group, Computer Engineering Department, CIT, Changa — *2009*

Languages

English	Conversationally fluent
Gujarati	Mother tongue, Conversationally fluent
Hindi	Conversationally fluent

Interests

Spirituality	Srimad Bhagavad Gita - Applied Philosophy in daily life
Student Counseling	Continues Motivation Therapy for Construction of Self-Image
Reading	CSR, Reader's Digest, TatvGyan
Sports	Martial Arts - Gold Medals [West India], Bronze [National]
Institutional Membership	IEEE-M, IETE-M, ISTE-LM

References

[1] Dr. Sun Sumei, Executive Director, Institute for Infocomm Research (I2R), Agency for Science, Technology and Research (A*STAR) - Singapore. Email: sunsm@i2r.a-star.edu.sg

[2] Professor Zhiguo Ding, IEEE Fellow, School of Electrical and Electronic Engineering, The University of Manchester, Manchester, M13 9PL, UK. Email: zhiguo.ding@manchester.ac.uk

[3] Dr Miguel Lopez-Benitez, Senior Lecturer (Associate Professor) - Electrical Engineering and Electronics, School of Electrical Engineering, Electronics and Computer Science - Faculty of Science and Engineering, University of Liverpool - Foundation Building - Brownlow Hill, Liverpool, UK. Email: M.Lopez-Benitez@liverpool.ac.uk