



## Dr. Monica Bhutani

**Secretary, IEEE SB DS Councillor's Forum**

**Assistant Professor, Head BVP IEEE**

**Department of Electronics and  
Communications**

*Bharati Vidyapeeth's College of Engineering  
(BVCOE)*

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### Qualifications

**Ph.D. from IIT Delhi (Research topic: MAC layer Issues in Optical Wireless Communication), 2018-2023**

**M.E. in Electronics and Communication Engineering: NITTTER, Chandigarh, Punjab University, 2006-2008.**

**B.E. in Electronics and Communication Engineering: M D University, Haryana, 2001-2005.**

### Research Interests

- Optical Wireless Communications
- Visible Light Communications, Li-Fi, IEEE 802.15.7 Standard
- Zigbee, IEEE 802.15.4 Standard
- Optical Wireless Communication
- Wireless Sensors (MAC layer)
- Wireless Communications
- Computer Networks
- Machine Learning and IoT

### Teaching Experience: 16+ Years

- Worked as Lecturer in the ECE Department at **Vaish College of Engineering**, Rohtak (Haryana) from 01/08/2005 till 25/08/2006.
- Served **PDM College of Engineering** (ECE Department) from 15/01/2008 - 29/10/2009.
- Currently serving **Bharati Vidyapeeth's College of Engineering**, New Delhi (since 02/10/2010) as Assistant Professor in the ECE department.

### Courses Taught

- Communication Systems
- Digital Communications
- Optical and Wireless Communications
- Signal and Systems
- Satellite Communications
- Data Communication and Networks
- Opto-Electronics and Optical Communication
- Analog Electronics
- Indian Knowledge Systems
- Wireless Communications

### Professional Recognition

- [1] Recognized Teacher of Bharati Vidyapeeth's College of Engineering under Guru Gobind Singh Indraprastha University (GGSIPU)
- [2] Serving as **IEEE Head** for BVP IEEE student chapter under Delhi Section.
- [3] Secretary, IEEE SB DS Councillor's Forum.

### Details of Sponsored Projects

- [1] Worked as Project staff in a consultancy project at IIT, Delhi.  
Project Duration: 15/08/2017 – 15 /11/2018 (15 Months)  
Project Details: Implementation of System Architecture of Visible Light Communication- PAN to facilitate Multi-user Access and Mobility.  
Consultant in-charge: Dr. Brejesh lall
- [2] Worked as Project staff in the project “ Building end-to-end 5G Test Bed” at IIT, Delhi.  
Project Duration: 15/12/2018 till 06/06/2019.  
Scope of the work: MAC issues in Li-Fi (Part of the Li-Fi Network Project)  
Consultant in-charge: Dr. Brejesh lall

### Scores as on Google Scholar

Citations	31
h-index	4
i10-index	0

### *Papers in International/National Journals*

- [1] M Bhutani et al. "Simulation and Performance Analysis of SMF and MMF with Varying lengths and Different Modulation patterns Using Dispersion Compensation," International Journal of Computer Applications 35 (8), 16-20, 2011.
- [2] M Bhutani et al. "Optical Transmission System Simulation for Analysis of Self-Phase Modulation Non-Linearity" International Journal of Scientific and Engineering Research, 4(6), 1707-1713, 2013
- [3] M Bhutani et al. "Performance Analysis of Four-Wave Mixing: A nonlinear Effect in Optical Fibers", International Journal of Computer Applications, 93(7), 2014.
- [4] M Bhutani et al. "Comparative Performance Analysis of Soliton Pulse Generation Techniques" International Journal of Computer Applications, 97(3), 2014.
- [5] M Bhutani et al. "Effect of Different Modulation Formats on DWDM Optical transmission systems in the presence of Four-Wave Mixing", International Journal of Science Technology and Engineering, Vol 4, Issue 3, 2015.
- [6] M Bhutani et al. "Simulation of a Single Channel Optical Communication system with Different Modulation formats in the presence of SPM nonlinearity", International Journal of Science Technology and Engineering, 7(6), 2015.
- [7] Bhutani, Monica, Brejesh Lall, and Abhishek Dixit. "MAC layer performance modeling for IEEE 802.15. 7 based on discrete-time Markov chain." IET Communications, 2021.
- [8] M Bhutani et al. "FD-OMAC: A Novel Full-Duplex Optical Media Access Control for IEEE 802.15.7" IEEE Access, 2021.
- [9] M Bhutani et al. "Analytical Modeling for Single Image Super Resolution" in "International Journal for Modern Trends in Science and Technology (IJMTST), 2022/3/3, Vol 8, Issue 03, Pages: IJMTST/08/03/097.
- [10] M Bhutani et al. "Electric vehicle accident alert system", in international journal of engineering technology and management sciences, Vol.4, Issue 6, 2022.
- [11] M Bhutani et al. "Optimization of Traffic Lights using OpenCV" in Research and Applications: Emerging Technologies Journal, HBRP Publication, Vol. 5, Issue 1, 18 January 2023.

- [12] M. Bhutani, B. Lall, and M. Agrawal, "Optical Wireless Communications: Research Challenges for MAC Layer," in IEEE Access, vol. 10, pp. 126969-126989, 2022, doi: 10.1109/ACCESS.2022.3225913.
- [13] M Bhutani et al. "Optimization of Traffic Lights using OpenCV" in Research and Applications: Emerging Technologies Journal, HBRP Publication, Vol. 5, Issue 1, 18 January 2023.
- [14] Monica Bhutani, Brejesh Lall, Monika Agrawal et al. An Efficient and Adaptive Superframe Structure for IEEE 802.15.7-Based Real-time Sensor Networks, 14 June 2023, PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-3038495/v1].
- [15] Monica Bhutani, Brejesh Lall, Monika Agrawal et al. A Novel Energy-Efficient Adaptive Superframe Structure for OWC-Based Real-time Bio-Sensor Networks, 02 February 2023, PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-2506266/v1].

### *Papers in International/National Conferences*

- [1] Presented paper entitled "Multi-user Detection Via Turbo Coding in MIMO Systems" at **All India Conference** on "ADVANCES IN COMMUNICATION, COMPUTERS, CONTROL & KNOWLEDGE MANAGEMENT" Organized by PDMCE in Collaboration with IEEE-IMS/EMBS (DELHI) on 19-20 Feb 2008.
- [2] Presented paper entitled "Reduced Instruction Set (RISC)" at **All India Conference** on "ADVANCES IN COMMUNICATION, COMPUTERS, CONTROL & KNOWLEDGE MANAGEMENT" Organized by PDMCE in Collaboration with IEEE-IMS/EMBS (DELHI) on 19-20 Feb 2008.
- [3] Presented paper entitled "Dispersion Compensating Fibers in Comparison with cost-effective Chirped Fiber Grating for Long-Haul Transmission" at **International Conference** on "INNOVATIVE TECHNOLOGIES (ICIT-09)" organized by PDMCE, in collaboration with IEEE-IMS/EMBS (DELHI) on 18-19 June 2009.
- [4] Presented paper entitled "To Manage the Undersea Operations" at **International Conference** on "INNOVATIVE TECHNOLOGIES (ICIT-09)" organized by PDMCE, in collaboration with IEEE-IMS/EMBS (DELHI) on 18-19 June 2009.
- [5] Presented paper entitled "An empirical study of 4G Mobile Communication" at **International Conference** on "INNOVATIVE TECHNOLOGIES (ICIT-09)" organized by PDMCE, in collaboration with IEEE-IMS/EMBS (DELHI) on 18-19 June 2009.
- [6] Presented paper entitled "A MATLAB Simulation Model for MAC layer of Visible light Communication" in 7<sup>th</sup> International Conference on Signal Processing and Integrated Networks (SPIN), 2020.

- [7] M Bhutani et al. "Implementing the solution for Hidden Node Problem in Wi-Fi," International Conference on Robotics, Communication Technology, Electronics, and Electrical Engineering, (ICRRCTEEE), 20/07/2020.
- [8] M Bhutani et al. "Colored Image transmission using Visible Light Communication," International Conference on Robotics, Communication Technology, Electronics, and Electrical Engineering, (ICRRCTEEE), 26/07/2020.
- [9] M. Bhutani et al. "Adaptive Density-Based Traffic Management System utilizing Ultrasonic Units and RODEM Algorithm," 2023 10th International Conference on Signal Processing and Integrated Networks (SPIN), Noida, India, 2023, pp. 571-577, doi: 10.1109/SPIN57001.2023.10116660.

### **Book Chapters:**

- [1] M Bhutani et al. "Smart Shopping", in "Green Computing in Network Security: Energy Efficient Solutions for Business and Home", CRC Press, 2022/1/10

### **Contributions In Conferences**

- [1] Served as Conference Committee Member for IAAST 2022 (International Association for Applied Science and Technology).
- [2] Served as a Technical Program Committee Member for TOCS 2022 (IEEE Conference on Telecommunications, Optics, and Computer Science).
- [3] Served as a Research Paper Reviewer in more than 25 National and International Conferences.

### **Short-Term Course/FDP/Workshop/Seminar Attended**

- [1] Participated in 5 Day FDP Under **TEQIP-III** on "**MATLAB for Engineering and Scientific Computations**" held from 22/02/2021 to 26/02/2021 at B K Birla Institute of Engineering & Technology, Pilani.

- [2] Participated in STC entitled **“Mathematical Tools for Optical and Wireless Communication (ETOWC-19)”** organized by the Department of ECE, **NSUT**, New Delhi, from 15/07/2019 to 20/07/2019.
- [3] Participated in STC course on **“OFC System Design and Performance Evaluation”** at **NITTTR**, Chandigarh, from 21/11/2011 to 25/11/2011.
- [4] Participated in MHRD-sponsored **GIAN course** on **“Circuits, Microsystems, and Packaging Techniques Intended for Autonomous Brain-Machine Interfaces”** organized by the Department of Electronics and Communication Engineering, Delhi Technological University, New Delhi during 20/12/2016- 24/12/2016.
- [5] Participated in FDP Programme on” Cloud Computing, Change Management, Disaster Management” held on 30/07/2011 at MSIT, New Delhi.
- [6] Participated in STC under Quality Improvement Programme (QIP) on **“Optical Fiber Wireless Communications and Networks”** organized by **IIT, Delhi**, from **17/12/2016 to 19/12/2016**.
- [7] Participated in 2 Day capacity building Workshop on OBE and Accreditation Process **(NEP-2020: Towards Holistic Education)**, during 2-3 June 2023, Organized by BVEC, New Delhi

### **Workshops/STC/FDPs attended at BVCOE**

- [1] Participated in STC on “Technical Writing and Research Publishing using Latex 2.0” from 23/09/2019 to 27/09/2019, organized by IT Department, BVCOE.
- [2] Attended 1 Day FDP on “Network Simulation using NetSim Software with Networking Simulation using NetSim Software” with DELLSOFT Technologies Pvt. Ltd. on 17/04/2017, organized by BVCOE, New Delhi.
- [3] Participated in FDP Organized by Tata Consultancy Services (TCS) on “Envisioning Entrepreneurship and Novel Research Methodology” held on 20/09/2013 and 21/09/2013 at BVCOE, New Delhi.
- [4] Participated in FDP entitled” Network Simulator ns3 Simulation for Network Protocols” from 23/04/2018 to 27/04/2018, organized by the CSE department, BVCOE.
- [5] Participated in a one-day Workshop entitled “Ethical Hacking” on 28/04/2014, organized by BVCOE in collaboration with i3indiya Technologies.
- [6] Certification of Appreciation received after attending the Patent and IPR Workshop held on 21/01/2019 conducted by MHRD’S IIC at BVCOE, New Delhi.
- [7] Attended a 2-day skill enhancement workshop on “MATLAB for Digital Circuit & Analysis” on 25/07/2018-26/07/2018 at BVCOE, New Delhi

### Workshops/Webinars/Guest-Lectures Organized at BVCOE

- [1] **Organized Webinar** on “Soft Skills” on 9<sup>th</sup> June 2021, Speaker: Ms. Sania Nazir.
- [2] **Organized Webinar** on “Patents in Nutshell – Building Strategic Assets”, Speaker: Mr. Satyoki Koundilya on 10<sup>th</sup> April 2021.
- [3] **Coordinator** for Ideathon Under Confluence 1.0 for Second year ECE Students for AY 2020-2021.

### Events Organized at BVCOE as Head IEEE, Student Branch (Delhi Section)

- [1] Organized Women's Day Interaction Activity at BVCOE to have open discussion and awareness about Women's situation in current technical colleges on 8th March 2023.
- [2] Organized Workshop at BVCOE, entitled "How to write quality SOP," with an objective to introduce SOP writing with hands-on experience, 20th March 2023.
- [3] Organized Tech-a-thon 2.0, an exciting series of coding-based rounds, Under BVEST 2023, dated 29th March 2023.
- [4] Organized RoboSoccer, a competition to build a robot that can kick a ball into the opponent's Goal Post, Under BVEST 2023, dated 29th March 2023.
- [5] Organized WIESTAR at Gov. Sarvodya Vidyalaya, New Delhi, with an objective to promote STEM fields among high school girls to encourage them to pursue science as a career, dated 28th April 2023.
- [6] Organized WIEHACK 4.0, 36-hour women-centric hybrid Hackathon, at BVCOE.

### Certificates Awarded

- [1] Certificate of participation from the **Indian Institute of Technology (IIT), New Delhi** on Completion of Summer Faculty Research Fellow Programme- 2012 under Continuing Education Programme from 16/05/2012 to 26/06/2012. Faculty Mentor: Dr. V K Jain.
- [2] Certificate of participation from the **Indian Institute of Technology (IIT), New Delhi** on Completion of Summer Faculty Research Fellow Programme- 2014 under Continuing Education Programme from 15/05/2014 to 09/07/2014. Faculty Mentor: Dr. V K Jain.

- [3] Received **Certificate of Appreciation** from Bharati Vidyapeeth's College of Engineering on completion of Project "Implementation of System Architecture of Visible Light Communication – PAN to facilitate Multi-user Access and Mobility" at **IIT, Delhi**, for the Academic Year 2018-2019.
- [4] Received **Best Researcher Award** from Bharati Vidyapeeth's College of Engineering for the Academic year 2020-2021 for the paper entitled "MAC Layer Performance Modelling for IEEE 802.15.7 Based on Discrete-Time Markov Chain" published in **IET Communications, Wiley**.
- [5] Received **Best Researcher Award** from Bharati Vidyapeeth's College of Engineering for the Academic year 2021-2022 for the paper "FD-OMAC: A Novel Full-Duplex Optical Media Access Control for IEEE 802.15. 7, published in **IEEE Access**."
- [6] Felicitated and awarded at IEEE Delhi Section 48th Foundation Day Pakhwada (15-Day Celebration) by BVICAM for WIEHACK 4.0 at BVCOE, New Delhi.
- [7] Received **Best Researcher Award** from Bharati Vidyapeeth's College of Engineering for the Academic year 2022-2023 for the paper "Optical Wireless Communications: Research Challenges for MAC Layer, published in **IEEE Access**."
- [8]

### **Reviewed Papers for Journals**

- [1] **IEEE Access**
- [2] **OSA-JOCN** (Optical Society of America- Journal of Optical Communication & Networking)
- [3] Journal of Electronics and Electrical Engineering (**JEEE**, ISSN: 2972-3280)
- [4] **Optic Express**
- [5] **IEEE Sensors Journal**
- [6] **Journal of Circuits, Systems and Computers**

### **Reviewed Papers for National/International Conferences**

- [1] International Conference on Electrical, Computer and Energy Technologies (**ICECET-2021**).
- [2] 8th Annual Conf. on Computational Science & Computational Intelligence (**CSCI 2021**).



- [3] 3rd International Conference on Electrical, Computer, Communications and Mechatronics Engineering (**ICECCME 2022**).
- [4] International Conference on Electrical, Computer and Energy Technologies (**ICECET 2022**).
- [5] 2nd International Conference on. Intelligent Vision and Computing (**ICIVC 2022**).
- [6] International Conference on Environmental Systems (**ICIES2022**).
- [7] OPJU International Technology Conference on Emerging Technologies for Sustainable Development (**otcon2022**).
- [8] World Conference on Artificial Intelligence: Advances and Applications (**WCAIAA2023**).
- [9] Congress on Control, Robotics, and Mechatronics (**CRM2023**).

**Dr. MONICA BHUTANI**

**Place: NEW DELHI**

#### **BIOGRAPHY:**

**Dr. Monica Bhutani is an accomplished academic and researcher, currently serving as an Assistant Professor and Head of BVP IEEE at Bharati Vidyapeeth's College of Engineering (BVCOE) in New Delhi. With a career spanning over 16 years, she has made significant contributions to Electronics and Communications.**

**Dr. Bhutani holds a Ph.D. from IIT Delhi, where her research focused on MAC layer issues in Optical Wireless Communication, demonstrating her expertise**

in the field. She completed her M.E. in Electronics and Communication Engineering from NITTTER, Chandigarh, Punjab University, and her B.E. in Electronics and Communication Engineering from M D University, Haryana.

Her diverse research interests include Optical Wireless Communications, Visible Light Communications (Li-Fi), IEEE 802.15.7 Standard, Zigbee, IEEE 802.15.4 Standard, Wireless Sensors (MAC layer), Wireless Communications, Computer Networks, Machine Learning, and IoT.

In her teaching career, Dr. Bhutani has imparted knowledge in various courses such as Communication Systems, Digital Communications, Optical and Wireless Communications, Signal and Systems, Satellite Communications, Data Communication and Networks, and more.

Dr. Bhutani's professional recognition includes being a Recognized Teacher of Bharati Vidyapeeth's College of Engineering under Guru Gobind Singh Indraprastha University (GGSIU). She serves as the IEEE Head for the BVP IEEE student chapter under the Delhi Section and holds the position of Secretary in the IEEE SB DS Councillor's Forum.

Her involvement in sponsored projects at IIT Delhi showcases her practical experience. She worked on projects related to Visible Light Communication and MAC issues in Li-Fi, contributing to implementing system architectures.

Dr. Bhutani has an impressive publication record with papers in international and national journals, covering topics such as optical transmission systems, soliton pulse generation techniques, and MAC layer performance modeling. Her recent publications delve into emerging areas like Electric vehicle accident alert systems, optimization of traffic lights using OpenCV, and innovative solutions for real-time sensor networks.

She actively participates in conferences and has presented papers on diverse subjects, showcasing her commitment to staying at the forefront of technological advancements. Her recent book chapter in "Green Computing in Network Security" further establishes her as a thought leader in the field.

Beyond her academic and research contributions, Dr. Bhutani actively organizes and coordinates workshops, webinars, and guest lectures. She has served on conference committees and as a technical program committee member for various events, demonstrating her commitment to fostering academic growth.

Dr. Monica Bhutani's dedication to her field is evident through her extensive academic contributions, her leadership in IEEE, and her efforts to encourage STEM education, particularly among women. Her numerous awards and certificates underscore her excellence in research, teaching, and service to the academic community.

In conclusion, Dr. Monica Bhutani is a distinguished figure in the academic and research community, making noteworthy contributions to Electronics and Communications. Her multifaceted roles as an educator, researcher, and IEEE leader reflect her commitment to advancing knowledge and fostering a culture of innovation in the academic realm.