

## PROFESSOR

### **DR. (MRS.) URMILA BHANJA**



**Designation:** Professor

**Department:** Electronics and Telecommunication  
Engineering

**Email:** [urmila@igitsarang.ac.in](mailto:urmila@igitsarang.ac.in)

**Contact No:** 09437142056

**Contact Address:** Urmila Bhanja, D-38, Nalco Nagar,  
Angul

**Educational Qualification:** B. E (PEC), Currently (PTU), M. Tech (IIT Kharagpur) &  
Ph.D. (IIT Kharagpur)

**Area of Expertise:** Optical Communication Network, Wireless  
Communication Network, Soft Computing, Optimization  
Techniques, VANET, IoT

**Area of Research:** Optical Communication Network, Wireless  
Communication Network, Soft Computing,  
Optimization Techniques, VANET, IoT

#### **Publications (Journal):**

1. **Urmila Bhanja, S.S Pathak, Queuing Model of Multihop Lightwave Network, IETE Journal of Research, vol .46, no 3, pp.133-139, May-June 2000**

2. **Urmila Bhanja**, S Mahapatra, R Roy, A novel solution to the DRWA problem in transparent optical networks International Journal of computer networks and communications. Vol 2, No 2, pp.119-130, 2010
3. **Urmila Bhanja**, R Roy, S Mahapatra, An evolutionary programming algorithm for finding constrained optimal disjoint paths for multihop communication networks, International Journal of Metaheuristics, Inderscience publisher, vol.1, no. 2, 2010, pp.132 - 155
4. **Urmila Bhanja**, S Mahapatra, R Roy, FWM aware Evolutionary Programming Algorithm for Transparent Optical Networks. Photonic Network Communication, Springer, vol.23, no.3, pp.285-299,2012
5. **Urmila Bhanja**, S Mahapatra, R Roy, An evolutionary programming algorithm for survivable routing and wavelength assignment in transparent optical networks, Information Sciences, Elsevier publisher, vol.222, pp.634- 647, 2013
6. **Urmila Bhanja**, S Mahapatra, A metaheuristic approach for optical network optimization problem, Applied Soft Computing, Elsevier publisher, vol.13, no.2, pp.981-997, 2013
7. **Urmila Bhanja**, S Mahapatra, R Roy, QoT aware Evolutionary Programming Algorithm for Transparent Optical Networks, Optik, Elsevier publisher, vol.124, pp. 6391-6399, 2013
8. Gautam Sahu, Sarita Sahu, **Urmila Bhanja**, Wireless Sensor Networks and its Challenges, International journal of Advanced Research in Electronics and Communication Engineering, vol. 2, Issue 12, pp.1010-1015, 2013.
9. Mande Xie, **Urmila Bhanja**, Guiyi Wei, Yun Ling, Mohammad Mehedi Hassan, Atif Alamri, SecNRCC: A loss Tolerant Secure Network Reprogramming with Confidentiality Consideration for Wireless Sensor Networks Concurrency and Computation: Practice and Experience, Wiley International, vol.27, no.10, pp. 2668-2680, 2014.
10. Mande Xie, **Urmila Bhanja**, Gouping Zhang, Guiyi Wei, Yun Ling, Social role based secure large data objects dissemination in mobile sensing environment, Computer Communication, Elsevier, Vol. 65, pp. 27-34, 2015.

11. Debajyoti Mishra, **Urmila Bhanja**, FWM Aware Fuzzy Dynamic Routing and Wavelength Assignment in Transparent Optical Networks World Academy of Science, Engineering and Technology, International Journal of Electrical, Computer, Energetic, Electronic and Communication Engineering, Vol. 9, no.8, pp.945-954, 2015
12. S Panda, **Urmila Bhanja**, Design and performance analysis of one dimensional zero cross correlation coding technique for a fixed wavelength hopping SAC-OCDMA, World Academy of Science, Engineering and Technology, International Journal of Electrical, Computer, Energetic, Electronic and Communication Engineering, vol. 10, no.10, pp.1-9, 2015
13. D.J Mishra, **U Bhanja**, Fuzzy Controlled Dynamic QoS Routing and Wavelength Assignment in Transparent Optical Networks, Journal of Emerging trend in computing and information science, vol.6, no.6, pp.308-317, 2015
14. D.J Mishra, **U Bhanja**, QoS aware Dynamic Routing and wavelength assignment technique using fuzzy logic controller in WDM networks, Journal of Telecommunications, Vol. 30, no.2, pp.1-10, 2015.
15. S. Panda, **U Bhanja**, Performance analysis of a novel coding technique for SAC-OCDMA,
16. Journal of Emerging trend in computing and information science, vol.6, no.6, pp. 299-307, 2015.
17. **Urmila Bhanja**, S. Panda, Comparison of novel coding techniques for a fixed wavelength hopping SAC-OCDMA, Photonic Network Communications, springer, Vol. 10, no.10, pp. 179–193, 2016
18. M. Das, B. Sahu, **U. Bhanja**, Diversity effect on outage probability in mobile wireless network, Electronics Letters, IET, vol.53, no.4, pp.283-285, 2016
19. S Panda, **Urmila Bhanja**, Design and Performance Improvement of Three-Dimensional Optical Code Division Multiple Access Networks with NAND Detection Technique, Academy of Science, Engineering and Technology, International Journal of Electrical, Computer, Energetic, Electronic and Communication Engineering vol.1, pp.1-10, 2016.

20. M. Das, B. Sahu, **U. Bhanja**, Bit Error Rate Analysis of Mobile Communication Network in Nakagami Fading Channel: Interference Considerations, World Academy of Science, Engineering and Technology, International Journal of Electrical, Computer, Energetic, Electronic and Communication Engineering vol.10, no.8, pp.1115-1118, 2016.
21. **U. Bhanja**, D.J. Mishra, Quality of service aware fuzzy dynamic routing and wavelength assignment technique in all optical networks Photon Photonic Network Communication, Springer, vol. 34, pp. 155–169, 2017.
22. A.S Lenka, Sikha Mishra, Satyaranjan Mishra, **Urmila Bhanja**, Guru Prasad Mishra, An extensive investigation of work function modulated trapezoidal recessed channel MOSFET Superlattices and Microstructures, Elsevier, vol.111, pp.878-888, 2017
23. M. Das, B. Sahu, **U. Bhanja**, Coverage Analysis of Mobile Network in Nakagami Fading Channel Wireless Personal Communications, Springer, vol. 97, no.2, pp.3261-3276, 2017
24. Mande Xie, **Urmila Bhanja**, Jun Shao, Gouping Zhang, Guiyi Wei LDSCD: A Loss and DoS Resistant Secure Code Dissemination Algorithm Supporting Multiple Authorized Tenants, Information Sciences, Elsevier Press, vol.420, pp.37-48, 2017
25. **Urmila Bhanja**, Bhagyashree Das, Anita Mohanty, Real Time Traffic Congestion Detection using Embedded System Intern International Journal of Vehicle Information and Communication Systems, Inderscience Publisher, vol.3, no.4, pp.267-280, 2017
26. S. Singhdeo, **Urmila Bhanja**, Design and Performance Analysis of Modified Two Dimensional Golomb code for Optical Code Division Multiple Access, Telecommunication Systems, Springer Publisher, Vol.69, pp.77-94, 2018
27. S. K Mohanty, G. Palei, **U. Bhanja**, C.S Mishra, A new-fangled high dimensional waveguide for multiple sensing applications using finite difference time domain method, Optik, Elsevier press Vol.172, pp.861-865, 2018
28. Sikha Mishra, **Urmila Bhanja**, Guru Prasad Mishra, Variation of source Gate work function on the performance of dual gate rectangular recessed channel SOI-MOSFET,

International journal of numerical modelling: Electronic networks, devices and fields.  
Wiley Publisher, Vol.32, Issue.1, pp. 1-10, 2018

29. Sikha Mishra, **Urmila Bhanja**, Guru Prasad Mishra, An analytical modelling, and performance analysis of graded work function gate recessed channel SOI-MOSFET, Nano science and Nanotechnology-Asia, Bentham Publisher, Vol.8, Issue.1, 2018
30. Chinmayee Panda, **U Bhanja**, Performance Analysis of FSO-OFDM in Foggy weather condition, International Journal of Innovative Research in Science, Engineering and Technology, Vol. 7, Issue 12, December 2018, pp.11858-11860
31. Banoj K Panda, **Urmila Bhanja**, Prasant K Pattnaik, A novel energy efficient obstacle aware routing algorithm for MANET, International Journal of knowledge based and intelligent engineering systems, vol. 24, no. 1, pp. 37-44, 2020
32. A. Mohanty, Mahapatra, **U. Bhanja**, Traffic congestion detection in a city using clustering techniques in VANETs, Indonesian Journal of Electrical Engineering and Computer Science, Vol. 13, No. 3, pp. 884-891, 2019
33. Banoj K Panda, Urmila Bhanja, Prasant K Pattnaik, Obstacle and Mobility Aware Optimal Routing for MANET, Journal of Intelligent and Fuzzy Systems, IOS Press, Vol.37, no.2, pp.1-11, 2019
34. Chinmayee Panda, **U Bhanja**, Integration of Multiple-Mode Subcarrier Index Modulation with OFDM, International Journal of Engineering Research & Technology (IJERT), Vol.8, No.5, 2019, pp. 184-187
35. Mohanty, S. S.; **Bhanja, U.**; Mishra, G, Impact of Underlap Engineering on Stepped Poly Gate In<sub>0.53</sub>Ga<sub>0.47</sub>As/InP Heterostructure Metal Oxide Semiconductor Field Effect Transistor for Better Analog Performance, Journal of Nanoelectronics and Optoelectronics, Publisher: American Scientific Publishers, Volume 14, Number 7, pp. 923-931(9), July 2019.
36. Soumya S Mohanty, **Urmila Bhanja** and G P Mishra, Electrostatic and radio frequency performance investigation of  $\delta$ -doped In<sub>0.53</sub>Ga<sub>0.47</sub>As/InP stepped poly gate metal oxide semiconductor field effect transistor, Journal of Micromechanics and Microengineering, IOP science publisher, Volume 29, Number 8, pp. 084001

37. Soumya S Mohanty, **Urmila Bhanja**, and G P Mishra, An Extensive Simulation Study of Gate Underlap Influence on Device Performance of Surrounding Gate In<sub>0.53</sub>Ga<sub>0.47</sub>As/InP Hetero Field Effect Transistor, International Journal of Nanoscience & Nanotechnology-Asia, Bentham Publisher, Volume 10, Number 2, 2020, pp. 157-165(9)
38. Sikha Mishra, **Urmila Bhanja**, Guru Prasad Mishra, Impact of structural parameters on DC performance of recessed channel SOI-MOSFET, International Journal of Nanoparticles, Inderscience Publisher. Vol. 11, No. 2, pp-140-153.
39. **Urmila Bhanja**, Sutikshna Singhdeo, Novel encryption circuit technique for security enhancement in optical code division multiple access, Photonic Network Communication, Springer, Volume 39, pp. 195-222, 2020.
40. M. Nayak, S. Das, **U. Bhanja**, M.R Senapati, Elephant herding optimization technique based neural network for cancer prediction, Informatics in medicine unlocked, Elsevier, Volume 21, 100445, 2020
41. M Das, B. D Sahu, **U. Bhanja**, Analysis of the effect of diversity on mobile wireless networks in a Nakagami fading channel, Physical Communication, Elsevier, Volume 39, 101031, 2020.
42. C. Panda, **U. Bhanja**, Performance improvement of hybrid OFDM-FSO system using modified OFDM receiver, International Journal of system, control, communication, Inderscience, 2021
43. **U. Bhanja**, C. Panda, Performance analysis of hybrid SAC-OCDMA OFDM model over free space optical communication, CCF Transactions on networking, springer, 2020
44. S. K Mohanty, S. Das, K. P Swain, **U. Bhanja**, G. Palai, A tool for testing of corona viruses using 3D photonic structure. Microsystem technologies, springer, 2020
45. M.R Senapati, M. Nayak, S. Das, **U. Bhanja**, Financial time-series prediction with feature selection using simplex method based social spider optimization algorithm, INDIAN JOURNAL OF COMPUTER SCIENCE AND ENGINEERING, Vol.12, No.2, pp. 326-347, 2021

46. M. Nayak, S. Das, **U. Bhanja**, M.R Senapati, Predictive Analysis for Cancer and Diabetes Using Simplex Method Based Social Spider Optimization Algorithm, IETE Journal of research, Taylor & Francis, pp.1-15, 2022

**Publications (Conference):**

1. U. Bhanja, S.S Pathak, Application of mean value analysis in Manhattan Street network performance analysis, International Conference on fibre optics & photonics, IIT DELHI, 1998, pp.697-700
2. A. K Swain, U. Bhanja, Evolutionary design of inverse dynamic controller for unconstrained multi-arm manipulator system, National conference on power systems, control, devices, NIT, Rourkela, 2004, pp.140-144
3. A.K Swain, Morris, U. Bhanja, Evolutionary design of inverse dynamic controllers for multiple arm Co-operating manipulator systems, International Conference on evolutionary computation, 2005, pp.54-71
4. U. Bhanja, A.K Swain, A.M Panda, Shortest Path Routing in Multihop Packet Switching Communication Network using Genetic algorithm, Book Chapter, Recent trends in IT and Soft computing. Excel books Publisher, 2008, pp.72-78
5. U. Bhanja, R. Roy, S. Mahapatra, An evolutionary programming algorithm for the RWA problem in Survivable optical networks, International Conference on parallel distributed processing, IIT ROORKEE, 2009, pp.1-4
6. U. Bhanja, R. Roy, S. Mahapatra, Impairment aware evolutionary programming algorithm for transparent optical networks, International IEEE conference ICBEIA, Kuala Lumpur, 2011, pp.135-140
7. U. Bhanja, D.J. Mishra, Comparison of metaheuristic approaches for Impairment aware transparent optical networks, International IEEE conference WOCN, IIT INDORE International IEEE conference WOCN, IIT INDORE, 2012, pp.1-67.
8. G. Sahu, B. D Sahu, U. Bhanja, Wireless sensor networks and its challenges, National conference MOMAVEA, IGIT SARANG, 2013, pp.148-153.

9. T. Mita Kumari, U. Bhanja, A. Tripathy, A survey of physical layer attacks and its security techniques in fibre optic networks, National conference MOMAVEA, IGIT SARANG, 2013, pp.116-121
10. U. Bhanja, S.N Mishra, Broadband over Power Line- an approach towards the pervasive technology, National conference MOMAVEA, IGIT SARANG, 2013, pp.32-37
11. G.K. Singh, U. Bhanja, S. K. Das, Dispersion penalty-based Q-factor analysis for the provisioning of light path over WDM/DWDM network, National conference MOMAVEA, IGIT SARANG, 2013, pp.25-31
12. D.J Mishra, U. Bhanja, A review of dynamic impairment aware routing and wavelength assignment techniques in transparent optical network, National conference MOMAVEA, IGIT SARANG, 2013, pp.170-174
13. K. Chuhan, T. Chakraborty, A. Nayak, Maharana, S. Panda, D. J Mishra, U. Bhanja, An adaptive routing Technique using fuzzy environment in communication network, National conference MOMAVEA, IGIT SARANG, 2013, pp.136-141
14. S. Bardhan, U. Bhanja, Design of green optical WDM network: A survey, National conference on modern trends in engineering solutions, IGIT SARANG,2013, pp.104-109
15. P. K Das, R. Pradhan, S. Pati, S. Dehury, D. Dhruvpati, U. Bhanja, Trend towards more energy efficient optical networks (IP/WDM), National conference on modern trends in engineering solutions, IGIT SARANG,2013, PP.101-107
16. U. Bhanja, D.J. Mishra, Dynamic routing and wavelength assignment using fuzzy logic controller in WDM optical networks, IEEE conference on signal processing and communication network, IIIT, Noida,2015. pp.380-385
17. D.Mishra, U. Bhanja, N. Swain, S. Salila, Managing Impairments in wavelength routed transparent optical networks: Revised approach, National conference advanced manufacturing & management systems for sustainable economy, IGIT SARANG, 2015, pp.150-156
18. U. Bhanja, D. Mishra, N. Swain, S. Salila, Managing Impairments in wavelength routed transparent optical networks: Revised approach, National conference advanced



manufacturing & management systems for sustainable economy, IGIT SARANG, 2015, pp.188-196

19. M.Das, B.D. Sahoo, U. Bhanja, Mobility and its effect on the performance of MANET, IEEE Power, Communication and Information Technology Conference,2015, pp.1-6
20. U. Bhanja, D.J. Mishra, Impairment aware fuzzy logic controlled dynamic routing and wavelength assignment. IEEE conference CSNT, Chandigarh,2016, pp.1-6
21. A. Jena, U. Bhanja, Performance analysis of modified two dimensional Golomb code, IEEE conference, INDICON, IISC, BANGLORE, 2016, pp.1-6
22. U. Bhanja, A. Khuntia, S. Almasety, 10Gbps 2D MGC OCDMA Code over FSO Communication System, IOP Conference Series: Materials Science and Engineering, 2016., pp.1-8.
23. A. Mohanty, U. Bhanja, S. Mahapatra, A. Mohanty, U. Bhanja, S. Mahapatra, in proc. of International Conference on Advanced Material Technologies (ICAMT)-2016, Visakhapatnam (India),2016, pp.1-9.
24. U. Bhanja, S. Almasety, A. Khuntia, System design for SAC OCDMA FSO network, IEEE SPIN, New Delhi, 2017, pp.454-458
25. S. Mishra, A.S. Lenka, S. S Mohanty, U. Bhanja, G.P. Mishra, Effect of RRC on SOI MOSFET to improve the SCE, IEEE conference on devices for integrated circuits, Kalyani, March, 2017, pp.536-541
26. U. Bhanja, A. Khuntia, S. Almasety, Performance analysis of a SAC-OCDMA FSO network, IEEE ISPPCC, JUIT, Noida 2017, pp.1-6
27. U. Bhanja, S. Singhdeo, Performance Analysis of a Three-Dimensional OCDMA code, IEEE ISPPCC, JUIT, Solan, HP,2017, pp.144-149
28. U. Bhanja, A. Khuntia, S. Almasety, Performance Analysis of Integrated SAC-OCDMA and OFDM Technique over FSO, IEEE ANTS,2017
29. U. Bhanja, S. Mahapatra, Rajesh K, A. Routroy, S. Behuria, Dynamic Traffic Congestion Detection by K-means clustering on Arduino Interface, IEEE ANTS,2017

30. M. Nayak, D. Parida, U. Bhanja, D. Das, K.D. Sa, A real time implementation of Spectrum sensing system using software defined radio, IEEE conference on intelligent computing, instrumentation, and control technologies,2017, pp.603-607
31. Urmila Bhanja, Urban Traffic Flow Optimization IEEE conference at IIT ROPAR, 2018
32. C. Panda, K. P Patra, A. Padhy, U. Bhanja, PDF analysis of different channel Models in FSO, Springer conference & Book Chapter, ICDSM-March 2019.
33. C. Panda, U. Bhanja, Effect of code and frequency index modulation in MIMO-OFDM-FSO System, OWT, 2020, MNIT, Jaipur
34. Urmila Bhanja, Design & Performance analysis of an encrypted Two-Dimensional Coding Technique for Optical CDMA, OWT, 2020, MNIT, Jaipur
35. Urmila Bhanja, An Attack Resistance Model for Trustworthiness Evaluation in VANET, IEEE Conference INDICON, 2020
36. S K Mohanty, U Bhanja, C.S Mishra, G Palei, 3D waveguide for nano photonic Application, ICNNEE 2020
37. SK Mohanty, U Bhanja, CS Mishra, G Palai, Analysis, Book chapter, Advances in Data Science and Management,2020, pp.523-530
38. C. Panda, U. Bhanja, "Effect of Adaptive Depth First Sphere Decoding scheme to MIMO-OFDM system in FSO", AI Manufacturing & Green Technology, book chapter, CRC Press,2020
39. C. Panda, U. Bhanja, QPSK subcarrier Intensity modulated FSO system, IEEE ICATME, 2021
40. B.K Panda, P.K Pattnaik, U. Bhanja, Impact of obstacles in terrain on performance of some reactive protocols in MANET, Machine Learning, and Information Processing,2021, 585-597
41. C. Panda, U. Bhanja, Energy Efficiency and BER analysis of Concatenated FEC Coded MIMO-OFDM-FSO System, IEEE ICAECC,2022.
42. U, Bhanja, S. Jena, P. Priyadarshini, S. Sahu, P. Parida, Preliminary Security Measures in smart meters, IEEE DELCON, 2022

**Google scholar Link:**

<https://scholar.google.com/citations?pli=1&authuser=2&user=F56y37MAAAAJ>