Washim Uddin Mondal

wmondal@purdue.edu | 11 March, 1994 | Burdwan, West Bengal, India
https://washim-uddin-mondal.github.io/

EDUCATION

Ph. D. | Indian Institute of Technology Kharagpur | 4 January 2017 - 4 January 2021

- Worked under the supervision of Prof. Goutam Das at G. S. Sanyal School of Telecommunications.
- Converted into Prime Minister's Research Fellowship (PMRF) in July 2018.

B. Tech.-M.Tech. Dual Degree | Indian Institute of Technology Kharagpur| July 2011 - April 2016

- Graduated from the Department of Electronics and Electrical Communication Engineering (E&ECE).
- M. Tech. Specialization in Telecommunications.
- Final Cumulative Grade Point Average (CGPA) was **9.51 / 10.0**.

10+2 | Burdwan Municipal High School | Burdwan| West Bengal

- Passed the Higher Secondary Examination conducted by West Bengal Council of Higher Secondary Education (WBCHSE) in May 2011 with **90.6%** marks.
- Passed the Secondary Examination conducted by West Bengal Board of Secondary Education (WBBSE) in May 2009 with **90.87%** marks.

EXPERIENCE

Purdue University | Postdoctoral researcher |12 April 2021 – Current | West Lafayette, Indiana, USA

- Working under the guidance of Prof. Satish V. Ukkusuri and Prof. Vaneet Aggarwal on reinforcement learning based models of large networked systems.

Indian Army | Special Invitee |27 September 2017 – 4 October 2017 | New Delhi, India

- Was specially invited by Directorate General of Signal Intelligence, Indian Army to solve a problem of national importance. Solved within one week with deliverable output.

WorldQuant LLC| Quantitative Researcher | July 2016 – December 2016 | Mumbai, India

- Worked on framing predictive mathematical models to anticipate price movements in stock markets.

École Polytechnique Fédérale de Lausanne (EPFL) | Internship| May 2014 – July 2014 | Lausanne, Switzerland

- Analytical modelling and simulation of different optical properties of carbon nanotube in radial mode of vibration.
- Performed under the supervision of Prof. Tobias J. Kippenberg.

AWARDS

2022 Winner of Graduate Thesis Evaluation in 7 minutes (GraTE-7) competition by IEEE Communications Society
2021 Best paper award at NeurIPS Workshop for Cooperative AI
2018 Prime Minister's Research Fellowship (PMRF)
2017 Appreciation Letter from Additional Director General (ADG), Signal Intelligence, Indian Army
2014 DAAD Scholarship
2011 IIT JEE| National Rank 953
2011 Kishor Vigyan Protsahan Yojana (KVPY) Scholarship| National Rank 81
2011 WB Joint Entrance Examination (Engineering)| State Rank 17
2011 Jagadish Bose National Science Talent Search (JBNSTS) Scholarship
2010 National Standard Examination in Physics| National Top 1%
2010 National Standard Examination in Astronomy (Senior)| State Top 1%
2007 National Standard Examination in Astronomy (Junior)| State Top 1%
2007 National Talent Search Examination (NTSE) Scholarship

SKILLS

• C • Python • PyTorch • MATLAB • OMNET++ • HTML • CSS • Javascript • LaTeX

JOURNAL PUBLICATIONS

[18] R. Wang, W. U. Mondal, M. A. Kishk, V. Aggarwal, and M. -S. Alouini, 'Terrain-Based Coverage Manifold Estimation: Machine Learning, Stochastic Geometry, or Simulation?', **IEEE Open Journal of the Communications Society**, 2023. (Accepted)

[17] W. U. Mondal, and V. Aggarwal, 'Reinforcement Learning with Delayed, Composite, and Partially Anonymous Reward', **Transactions on Machine Learning Research**, Aug. 2023.

[16] A. A. Sardar, D. Roy, W. U. Mondal, and G. Das, 'Coalition Formation for Outsourced Spectrum Sensing in Cognitive Radio Network', **IEEE Transactions on Cognitive Communications and Networking**, vol. 9, no.3, pp. 580-592, Jun. 2023.

[15] W. U. Mondal, V. Aggarwal, and S. V. Ukkusuri, 'Mean-Field Control based Approximation of Multi-Agent Reinforcement Learning in Presence of a Non-decomposable Shared Global State', **Transactions on Machine Learning Research**, May 2023.

[14] W. U. Mondal, P. D. Mankar, G. Das, V. Aggarwal, and S. V. Ukkusuri, 'Deep Learning based Coverage and Rate Manifold Estimation in Cellular Networks', **IEEE Transactions on Cognitive Communications and Networking**, vol. 8, no. 4, pp. 1706-1715, Dec. 2022.

[13] W. U. Mondal, V. Aggarwal, and S. V. Ukkusuri, 'On the Near-Optimality of Local Policies in Large Cooperative Multi-Agent Reinforcement Learning', **Transactions on Machine Learning Research**, Sept. 2022.

[12] A. A. Sardar, D. Roy, W. U. Mondal, and G. Das, 'Sustainability Analysis of Opportunistic CR-IoT Network Employing Microwave Power Transfer', **IEEE Transactions on Cognitive Communications and Networking**, vol. 8, no. 3, pp. 1411-1421, Sept. 2022.

[11] A. A. Sardar, D. Roy, W. U. Mondal, and G. Das, 'Queuing Analysis of QoS Aware Microwave Power Transfer Enabled CR-IoT Network', **IEEE Transactions on Wireless Communications**, vol. 21, no. 9, pp. 6834-6846, Sept. 2022.

[10] W. U. Mondal, M. Agarwal, V. Aggarwal, and S. V. Ukkusuri, 'On the Approximation of Cooperative Heterogeneous Multi-Agent Reinforcement Learning (MARL) using Mean Field Control (MFC)', **Journal of Machine Learning Research**, vol. 23, no. 129, pp. 1-46, Mar. 2022.

[9] W. U. Mondal, A. A. Sardar, and G. Das, 'Economic Analysis of Cognitive Underlay Networks: A Nash Bargaining Based Approach', **IEEE Transactions on Vehicular Technology**, vol. 70, no. 2, pp. 2024-2029, Feb. 2021.

[8] W. U. Mondal, and G. Das, 'On Exact Distribution of Poisson-Voronoi Area in K-tier HetNets with Generalized Association Rule', **IEEE Communications Letters**, vol. 24, no. 10, pp. 2142 - 2146, Oct. 2020.

[7] W. U. Mondal, D. Roy, S. Dutta, and G. Das, 'Economics of Resilient TWDM PONs', **IEEE/OSA Journal of Lightwave Technology**, vol. 38, no. 8, pp. 2114-2126, Apr. 2020.

[6] W. U. Mondal, A. A. Sardar, N. Biswas, and G. Das, 'Nash Bargaining Based Economic Analysis of Opportunistic Cognitive Cellular Networks', **IEEE Transactions on Cognitive Communications and Networking**, vol. 6, no. 1, pp. 242-255, Mar. 2020.

[5] W. U. Mondal, and G. Das, 'Economics of TWDM PONs with Nonlinear Pricing', **IEEE Communications Letters**, vol. 23, no. 5, pp. 822-825, May 2019.

[4] W. U. Mondal, D. Roy, S. Dutta, and G. Das, 'Economic Analysis of TWDM PONs: A Sustainability and Policy-Making Perspective', **IEEE/OSA Journal of Optical Communications and Networking**, vol. 11, no. 3, pp. 79-94, Mar. 2019.

[3] W. U. Mondal, and G. Das, 'Blocking Predation in Cellular Monopoly through Non-linear Spectrum Pricing', **IEEE Communications Letters**, vol. 21, no. 11, pp. 2464-2467, Nov. 2017.

[2] W. U. Mondal, and G. Das, 'Uplink User Process in Poisson Cellular Network', **IEEE Communications Letters**, vol. 21, no. 9, pp. 2013-2016, Sept. 2017.

[1] W. U. Mondal, S. Biswas, G. Das, and P. Ray, 'Traffic-Aware Green Cognitive Radio', **Physical Communication**, vol. 23, pp. 20-28, Jun. 2017.

CONFERENCE PUBLICATIONS

[6] W. U. Mondal, and V. Aggarwal, 'Improved Sample Complexity Analysis of Natural Policy Gradient Algorithm with General Parameterization for Infinite Horizon Discounted Reward Markov Decision Processes', **International Conference on Artificial Intelligence and Statistics (AISTATS)**, Valencia, Spain, 2024.

[5] Q. Bai*, W. U. Mondal*, and V. Aggarwal, 'Regret Analysis of Policy Gradient Algorithm for Infinite Horizon Average Reward Markov Decision Processes', **AAAI Conference on Artificial Intelligence**, Vancouver, Canada, 2024.

[4] W. U. Mondal, V. Aggarwal, and S. V. Ukkusuri, 'Can Mean Field Control (MFC) Approximate Cooperative Multi Agent Reinforcement Learning (MARL) with Non-Uniform Interaction?', **Conference on Uncertainty in Artificial Intelligence (UAI)**, Eindhoven, Netherlands, 2022.

[3] W. U. Mondal, M. Agarwal, V. Aggarwal, and S. V. Ukkusuri, 'On the Approximation of Cooperative Heterogeneous Multi-Agent Reinforcement Learning (MARL) using Mean Field Control (MFC)', **Neural Information Processing Systems (NeurIPS)** Workshop for Cooperative AI, 2021, **Best paper award, Spotlight talk**.
[2] W. U. Mondal, and G. Das, 'Predation Blocking Strategies in Real Cellular Networks and Its Impact on Spectrum Revenue', **IEEE Vehicular Technology Conference (VTC-Fall)**, Honolulu, Hawaii, USA, 2019.
[1] W. U. Mondal, A. A. Sardar, N. Biswas, and G. Das, 'Nash Bargaining Based Economic Analysis of Cognitive Cellular Networks', **IEEE International Conference on Communications (ICC)**, Shanghai, China, 2019.
* Equal contribution.