

# 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

- 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 •  $\LaTeX$

## COURSEWORK

- Information Theory
- Convex Optimization
- Physical Layer Security
- Linear Algebra
- Detection & Estimation Theory
- Queueing Theory
- Analog + Digital Communications
- Real Analysis
- Game Theory
- Basic Probability Theory
- MIMO Communications
- Complex Analysis

## JOURNAL PUBLICATIONS

- [11] 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**, (Accepted), 2022.
- [10] A. A. Sardar, D. Roy, W. U. Mondal, and G. Das, 'Queueing Analysis of QoS Aware Microwave Power Transfer Enabled CR-IoT Network', **IEEE Transactions on Wireless Communications**, (Accepted), 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

- [4] 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**.
- [3] 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.
- [2] 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.
- [1] A. A. Sardar, W. U. Mondal, and G. Das, 'Predation Blocking Strategy in Presence of Fraudulent Incumbent Service Provider', **IEEE International Conference on Advanced Networks and Telecommunication Systems (ANTS)**, Goa, India, 2019.

## PREPRINTS

- [3] 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?', arXiv:2203.00035.
- [2] 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', arXiv:2202.06390.
- [1] A. A. Sardar, D. Roy, W. U. Mondal, and G. Das, 'Queueing Analysis of Opportunistic Cognitive Radio IoT Network with Imperfect Sensing', arXiv:2103.08875.