Curriculum Vitae

Dr. Ayan Mondal

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https://ayanmondal.github.io/

Postdoctoral Research Engineer
Myriads Team, Inria
Univ Rennes, Inria, CNRS, IRISA, France
Formerly TCS PhD Research Fellow (India)

Education

Doctor of Philosophy 2020
Department of Computer Science and Engineering
Indian Institute of Technology Kharagpur, India
Thesis: *Traffic Engineering in Software-Defined Data Center Networks for IoT*
Supervisor: Professor Sudip Misra

Master of Science (by Research) 2015
School of Information Technology
Indian Institute of Technology Kharagpur, India
Thesis: *Distributed Energy Management in Smart Grid*
Supervisor: Professor Sudip Misra
Grade (out of 10): 9.73

Bachelor of Technology 2012
Electronics and Communication Engineering
St. Thomas' College of Engineering and Technology
West Bengal University of Technology, India
Grade (out of 10): 8.99

Higher Secondary 2008
Pure Science
West Bengal Council of Higher Secondary Education, India
Percentage: 84.57

Secondary 2006
West Bengal Board of Secondary Education, India
Percentage: 92.00

Research Interests

- Internet of Things (IoT)
- Software-Defined Network (SDN)
- Software-Defined DCN (SD-DCN)
- Sensor-Cloud
- Fog/Edge Networks
- Game Theory Applications
- Smart Grid Communication
- Smart Grid Energy Management
- Wireless Sensor Networks (WSNs)

Professional Experience

Distributed Stream processing on Fog and Edge Systems via Transprecise Computing — October 2020 - Present (Postdoctoral Researcher)
Univ Rennes, Inria, CNRS, IRISA
Rennes, France
Sponsored by: European Union

FogCity: QoS-Aware Resource Management for Smart Cities — June 2018 - September 2018 (Visiting Researcher)
Univ Rennes, Inria, CNRS, IRISA
Rennes, France
Sponsored by: IFCPAR/CEFIPRA

An Indigenous Framework for Authenticity Integrity and Non-Repudiation in Data Communication — February 2016 (Senior Research Fellow)
Sponsored Research and Industrial Consultancy
Indian Institute of Technology Kharagpur, India
Sponsored by: DRDO, India

Development of feasibility assessment model for adaptation of underground coal gasification technology in the North-East Region of India — August 2014 – January 2016 (Senior Project Officer)
Sponsored Research and Industrial Consultancy
Indian Institute of Technology Kharagpur, India Sponsored by: DietY, India

Development of feasibility assessment model for adaptation of underground coal gasification technology in the North-East Region of India — August 2013 – July 2014 (Junior Project Officer)
Sponsored Research and Industrial Consultancy
Indian Institute of Technology Kharagpur, India Sponsored by: DietY, India

Development of feasibility assessment model for adaptation of underground coal gasification technology in the North-East Region of India — August 2012 – July 2013 (Junior Project Assistant)
Sponsored Research and Industrial Consultancy
Indian Institute of Technology Kharagpur, India Sponsored by: DietY, India

Publications

Journals

[J19] S. Misra, **A. Mondal**, P. V. S. Kumar, and S. K. Pal, "SEED: QoS-Aware Sustainable Energy Distribution in Smart Grid," *IEEE Transactions on Sustainable Computing*, pp.1-11, January 2021. DOI: 10.1109/TSUSC.2021.3049132

[J18] A. Chakraborty, S. Misra, and **A. Mondal**, "QoS-Aware Dynamic Cost Management Scheme for Sensors-as-a-Service," *IEEE Transactions on Services Computing*, Early Access, pp. 1-12, July 2020. DOI: 10.1109/TSC.2020.3011495

[J17] S. Misra, **A. Mondal**, P. Bhavathankar, and M.-S. Alouini, "M-JAW: Mobility-Based Jamming Avoidance in Wireless Sensor Networks," *IEEE Transactions on Vehicular Technology*, vol. 69, no. 5, pp. 5381-5390, May 2020. DOI: 10.1109/TVT.2020.2982966

[J16] **A. Mondal** and S. Misra, "FlowMan: QoS-Aware Dynamic Data Flow Management in Software-Defined Networks," *IEEE Journal on Selected Areas in Communications*, vol. 38, no. 7, pp. 1366-1373, July 2020. DOI: 10.1109/JSAC.2020.2999682

[J15] A. Roy, **A. Mondal**, S. Misra, and M. S. Obaidat, "ORCID: Opportunistic Re-Connectivity for Network Management in the Presence of Dumb Nodes in Wireless Sensor Networks," *IEEE Systems Journal*, vol. 14, no. 1, pp. 9-16, March 2020. DOI: 10.1109/JSYST.2019.2956324

[J14] **A. Mondal**, S. Misra, and I. Maity, "AMOPE: Performance Analysis of OpenFlow Systems in Software-Defined Networks," *IEEE Systems Journal*, vol. 14, no. 1, pp. 124-131, March 2020. DOI: 10.1109/JSYST.2019.2912843

[J13] S. Misra, **A. Mondal**, and S. Khajjayam, "Dynamic Big-Data Broadcast in Fat-Tree Data Center Networks with Mobile IoT Devices," *IEEE Systems Journal*, vol. 13, no. 3, pp. 2898-2905, September 2019. DOI: 10.1109/JSYST.2019.2899754

[J12] I. Maity, **A. Mondal**, S. Misra, and C. Mandal, "Tensor-Based Rule-Space Management System in SDN," *IEEE Systems Journal*, vol. 13, no. 4, pp. 3921-3928, December 2019. DOI: 10.1109/JSYST.2018.2879321

[J11] A. Chakraborty, **A. Mondal**, A. Roy, and S. Misra, "Dynamic Trust Enforcing Pricing Scheme for Sensors-as-a-Service in Sensor-Cloud Infrastructure," *IEEE Transactions on Services Computing*, pp. 1-12, September 2018. DOI: 10.1109/TSC.2018.2873763

[J10] I. Maity, **A. Mondal**, S. Misra, and C. Mandal, "CURE: Consistent Update with Redundancy Reduction in SDN," *IEEE Transactions on Communications*, vol. 66, no. 9, pp. 3974-3981, September 2018. DOI: 10.1109/TCOMM.2018.2825425

[J9] **A. Mondal**, S. Misra, and I. Maity, "Buffer Size Evaluation of OpenFlow Systems in Software-Defined Networks," *IEEE Systems Journal*, vol. 13, no. 2, pp. 1359-1366, June 2019. DOI: 10.1109/JSYST.2018.2820745

[J8] **A. Mondal**, S. Misra, L. S. Patel, S. K. Pal and M. S. Obaidat, "DEMANDS: Distributed Energy Management Using Non-cooperative Scheduling in Smart Grid," *IEEE Systems Journal*, Vol. 12, no. 3, pp. 2645-2653, September 2018. DOI: 10.1109/JSYST.2017.2723961

[J7] P. Bhavathankar, **A. Mondal**, and S. Misra, "Topology Control in the Presence of Jammers for Wireless Sensor Networks," *International Journal of Communication Systems*, Vol. 30, no. 13, pp. 1-11, January 2017. DOI: 10.1002/dac.3289

[J6] A. Roy, S. Misra, P. Kar, and **A. Mondal**, "Topology Control for Self-Adaptation in Wireless Sensor Networks with Temporary Connection Impairment," *ACM Transactions on Autonomous and Adaptive Systems*, Vol. 11, no. 4, pp. 21:1-21:34, January 2017. DOI: 10.1145/2979680

[J5] **A. Mondal**, S. Misra, and Mohammad S. Obaidat, "Distributed Home Energy Management System with Storage in Smart Grid Using Game Theory," *IEEE Systems Journal*, vol. 11, no. 3, pp. 1857-1866, September 2017. DOI: 10.1109/JSYST.2015.2421941

[J4] **A. Mondal** and S. Misra, "Game-Theoretic Energy Trading Network Topology Control for Electric Vehicles in Mobile Smart Grid," *IET Networks*, vol. 4, no. 4, pp. 220-228, July 2015. DOI: 10.1049/iet-net.2014.0089

[J3] S. Misra, T. Ojha, and **A. Mondal**, "Game-theoretic Topology Control for Opportunistic Localization in Sparse Underwater Sensor Networks," *IEEE Transactions on Mobile Computing*, vol. 14, no. 5, pp. 990-1003, July 2014. DOI: 10.1109/TMC.2014.2338293

[J2] S. Misra, G. Mali, and **A. Mondal**, "Distributed Topology Management for Wireless Multimedia Sensor Networks: Exploiting Connectivity and Cooperation," *International Journal of Communication Systems*, vol. 27, no. 3, pp. 1367-1387, March 2014. DOI: 10.1002/dac.2770

[J1] S. Misra, S. Bera, **A. Mondal**, R. Tirkey, H.-C. Chao, S. Chattopadhyay, "Optimal Gateway Selection in Sensor-Cloud Framework for Health Monitoring," *IET Wireless Sensor Systems*, vol. 3, no. 4, pp. 61-68, December 2013. DOI: 10.1049/iet-wss.2013.0073

Conferences

[C14] **A. Mondal** and S. Misra, "BIND: Blockchain-Based Flow-Table Partitioning in Distributed Multi-Tenant Software-Defined Networks," in *Proceedings of IEEE International Conference on Computer Communications Workshops* (INFOCOM Workshops): *Blockchain for Secure Software defined Networking in Smart Communities* (BlockSecSDN), Toronto, Canada, July 2020, pp. 1-6. (Accepted)

[C13] A. Chakraborty, S. Misra, **A. Mondal**, and Mohammad S. Obaidat, "SensOrch: QoS-Aware Resource Orchestration for Provisioning Sensors-as-a-Service," in *Proceedings of IEEE International Conference on Communications* (ICC), Dublin, Ireland, June 2020, pp. 1-6. DOI: 10.1109/ICC40277.2020.9148621

[C12] S. Misra, **A. Mondal**, and P. Kumar, "D2M: Mobility-Aware Dynamic Data Multicasting in Software-Defined Data Center Networks," in *Proceedings of IEEE International Conference on Communications Workshops* (ICC Workshops): *Secure and Dependable Software Defined Networking for Sustainable Smart Communities* (SecSDN), Shanghai, China, March 2019, pp. 1-6.
DOI: 10.1109/ICCW.2019.8756718 (**Hot Topic Paper Award**)

[C11] S. Misra, A. Mondal, and **A. Mondal**, "DATUM: Dynamic Topology Control for Underwater Wireless Multimedia Sensor Networks," in *Proceedings of IEEE Wireless Communications and Networking Conference* (WCNC), Marrakech, Morocco, December 2019, pp. 1-6. DOI: 10.1109/WCNC.2019.8885632

[C10] **A. Mondal**, S. Misra, and A. Chakraborty, "TROD: Throughput-Optimal Dynamic Data Traffic Management in Software-Defined Networks," in *Proceedings of IEEE Global Communications Conference Workshops* (GLOBECOM Workshops): *Software defined Networking for 5G Architecture in Smart Communities*, Abu Dhabi, UAE, December 2018, pp. 1-6. DOI: 10.1109/GLOCOMW.2018.8644398

[C9] **A. Mondal** and S. Misra, "Dynamic Micro-Grid Selection by Plug-In Electric Vehicles in Smart Grid: An Evolutionary Game," in *Proceedings of IEEE Wireless Communications and Networking Conference* (WCNC), Barcelona, Catalonia, Spain, April 2018, pp. 1-2.

[C8] A. Chakraborty, **A. Mondal**, and S. Misra, "Cache-Enabled Sensor-Cloud: The Economic Facet," in *Proceedings of IEEE Wireless Communications and Networking Conference* (WCNC), Barcelona, Catalonia, Spain, April 2018, pp. 1-6. DOI: 10.1109/WCNC.2018.8377069

[C7] **A. Mondal** and S. Misra, "DCoE: Game-Theoretic Dynamic Coalition Extension with Micro-Grid Failure in Smart Grid," in *Proceedings of IEEE International Conference on Advanced Networks and Telecommunications Systems* (ANTS), Bhubaneswar, India, December 2017, pp. 1-6. DOI: 10.1109/ANTS.2017.8384118

[C6] **A. Mondal** and S. Misra, "Game-theoretic Green Electric Vehicle Energy Networks Management in Smart Grid," in *Proceedings of IEEE International Conference on Advanced Networks and Telecommunications Systems* (ANTS), Kolkata, India, December 2015, pp. 1-6. DOI: 10.1109/ANTS.2015.7413616

[C5] **A. Mondal** and S. Misra, "Dynamic Data Aggregator Unit Selection in Smart Grid: An Evolutionary Game Theoretic Approach," in *Proceedings of the 11th IEEE India Conference on Emerging Trends and Innovation in Technology* (INDICON), Pune, India, December 2014, pp. 1-6. DOI: 10.1109/INDICON.2014.7030614

[C4] **A. Mondal** and S. Misra, "Game-Theoretic Distributed Virtual Energy Cloud Topology Control for Mobile Smart Grid," in *Proceedings of the* 6^{th} *IEEE International Conference on Cloud Computing Technology and Science* (CloudCom), Singapore, December 2014, pp. 54-61. DOI: 10.1109/CloudCom.2014.83

[C3] A. Roy, **A. Mondal**, and S. Misra, "Connectivity Re-establishment in the Presence of Dumb Nodes in Sensor-Cloud Infrastructure: A Game Theoretic Approach," in *Proceedings of Emerging Issues in Cloud (EIC) workshop in conjunction with the* 6^{th} *IEEE International Conference on Cloud Computing Technology and Science* (CloudCom), Singapore, December 2014, pp. 847-852. DOI: 10.1109/CloudCom.2014.121

[C2] S. Misra, **A. Mondal**, S. Banik, M. Khatua, S. Bera, and Mohammad S. Obaidat, "Residential Energy Management in Smart Grid: A Markov Decision Process-Based Approach," in *Proceedings of IEEE International Conference on Internet of Things* (iThings), Beijing, China, August 2013, pp. 1152-1157. DOI: 10.1109/GreenCom-iThings-CPSCom.2013.200

[C1] **A. Mondal** and S. Misra, "Dynamic Coalition Formation in a Smart Grid: A Game Theoretic Approach," in *Proceedings of IEEE International Conference on Communications Workshops* (ICC Workshops): *Smart Communication Protocols and Algorithms* (SCPA), Budapest, Hungary, June 2013, pp. 1067-1071. DOI: 10.1109/ICCW.2013.6649395

Patent

[P1] **A. Mondal**, S. K. Roy, A. Roy, and S. Misra, "A Cloud Based Automatized System for On Demand and Without Service Delay Supply of Energy to End Users," *Indian Patent Filed*, File No. 201631007632, Date March 4, 2016.

Teaching Experience

Teaching Assistant

Software Engineering Lab (CS29006) — January – July, 2020
Department of Computer Science and Engineering — January – July, 2019
Indian Institute of Technology Kharagpur — January – July, 2018

Programming and Data Structures Lab (CS19001) — July – December, 2018
Department of Computer Science and Engineering — January – June, 2017
Indian Institute of Technology Kharagpur

Wireless Ad-Hoc and Sensor Networks (IT60119) — July – December, 2017
Department of Computer Science and Engineering — July – December, 2016
Indian Institute of Technology Kharagpur

Internet and Web-based Technologies (IT60102) — January – May, 2016
Department of Computer Science and Engineering
Indian Institute of Technology Kharagpur

Underwater Sensor Networks: Theory and Simulations — April 2016
Short-term Course
NPOL, DRDO

Supervision and Mentorship Experience

All the following students were under direct supervision of Professor Sudip Misra.

Doctoral Candidate

Dr. Prasenjit Bhavathankar, *Department of Computer Science and Engineering* — 2015-2017
Indian Institute of Technology Kharagpur
Topic: *Jamming-Aware QoS Enhancement in Wireless Sensor Networks*

Master of Science (by Research) Student

Aishwariya Chakraborty, *Department of Computer Science and Engineering* — 2016-2018
Indian Institute of Technology Kharagpur
Topic: *QoS-Aware Sensor-as-a-Service in Sensor-Cloud*

Master of Technology Student

Lakshmi S. Patel, *School of Information Technology* — 2013-2014
Indian Institute of Technology Kharagpur
Topic: *Energy Management in Smart Grid*

Shukla Banik, *School of Information Technology* — 2012-2013
Indian Institute of Technology Kharagpur
Topic: *Energy Management in Smart Grid*

Reena Tirkey, *School of Information Technology* 2012-2013
Indian Institute of Technology Kharagpur
Topic: *Gateway Selection in Sensor-Cloud*

Undergraduate Interns

Argha Boksi, *Department of Computer Science and Engineering* 2018-2019
National Institute of Technology Durgapur
Topic: *Smart Grid Communication*

Pankaj Kumar, *Department of Computer Science and Engineering* 2017-2018
National Institute of Technology Patna
Topic: *Software-Defined Data Center Networks for IoT*

Swetha Khajjayam, *Department of Computer Science and Engineering* 2016-2017
National Institute of Technology Durgapur
Topic: *Software-Defined Data Center Networks for IoT*

P. V. Sudheer Kumar, *Department of Computer Science and Engineering* 2015-2016
National Institute of Technology Durgapur
Topic: *Distributed Energy Management in Smart Grid*

Abhishek Basu, *Department of Computer Science and Engineering* 2014-2015
NRCC Institute of Information Technology, West Bengal University of Technology
Topic: *Energy Management in Smart Grid*

Suman Kumar Ghosh, *Department of Computer Science and Engineering* 2014-2015
NRCC Institute of Information Technology, West Bengal University of Technology
Topic: *Energy Management in Smart Grid*

Conference Chairmanship

VNI: Virtualization for Enabling Next-Generation IoT Networks Workshop Chair
Co-located with *IEEE HPSR* 2021
Paris, France
June 7-9, 2021

International Conference on Advanced Computing and Intelligent Engineering Session Chair
(ICACIE) 2018 (Springer)
Siksha 'O' Anusandhan (Deemed to be University)
Bhubaneswar, India
December 22-24, 2018

IEEE Students' Technology Symposium (TechSym) 2016 Track Chair
Indian Institute of Technology Kharagpur, India
September 30 – October 2, 2016

Invited/Delivered Talk

International Conference on Advanced Computing and Intelligent Engineering (ICACIE) 2020 (Springer)
Topic: *Traffic Management in Software-Defined Data Center Networks for IoT*
Université des Mascareignes (UdM), Mauritius
June 25-27, 2020

Internet of Things: Theory & Applications
TEQIP-III Course
Topic: *Software-Defined Networks for IoT*
Indian Institute of Technology Kharagpur, India
October 24-28, 2018

Internet of Things:Convergence of Sensing, Cloud and Big-Data Networking
AICTE/QIP Sponsored Short-term course
Topic: *IoT for Enabling Smart Grid*
Indian Institute of Technology Kharagpur, India
July 13-26, 2015

Memberships

Institute of Electrical and Electronics Engineers (IEEE) Member (S'13-M'21)
IEEE Communications Society
IEEE Computer Society
IEEE Information Theory Society
IEEE Young Professionals

Association for Computing Machinery (ACM) Student Member (S'13)

Referee Services

IEEE Journal on Journal on Selected Areas in Communications (IEEE JSAC); IEEE Transactions on Smart Grid (IEEE TSG); IEEE Transactions on Communications (IEEE TCOM); IEEE Transactions on Vehicular Technology (IEEE TVT); IEEE Transactions on Mobile Computing (IEEE TMC); IEEE Transactions on Sustainable Energy (IEEE TSTE); IEEE Systems Journal; IEEE Communications Magazine; Pervasive and Mobile Computing Journal (PMC) (Elsevier); IET Networks; IET Generation; IET Wireless Sensor Systems; Transmission & Distribution; International Journal of Communication Systems (Wiley); Wireless Communications and Mobile Computing (WCMC) (Wiley); International Journal of Communication Networks and Distributed Systems (Springer); IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS) 2016; IEEE Students' Technology Symposium (TechSym) 2016; IEEE TechSym 2014

TPC Member

IEEE International Conference on Communications (ICC) 2021; IEEE Students' Technology Symposium (TechSym) 2016; International Conference on Solar Energy & Building (ICSoEB) 2015; International Conference on Engineering & Computational Innovation Sciences (ENCINS) 2015; World Symposium on Mechatronics Engineering & Applied Physics (WSMEAP) 2015; Global Summit on Computer & Information Technology (GSCIT) 2015; International Conference on Single Processing & Data Mining (ICSPDM) 2015; Advancement on Mechanical and Manufacturing Engineering Technology (ADMMET) 2015

Awards/Honours Received

- Recipient of the **HoT Topic Paper Award** in the 2^{nd} Secure and Dependable Software Defined Networking for Sustainable Smart Communities (SecSDN) in conjunction with IEEE International Conference on Communications (ICC) 2019 for the paper entitled "D2M: Mobility-Aware Dynamic Data Multicasting in Software-Defined Data Center Networks".

- Recipient of the **Tata Consultancy Services (TCS) Fellowship**, 2015-2019.
- Recipient of the **Institute** (Indian Institute of Technology Kharagpur) **Full Financial Grant** for presenting paper in the IEEE International Conference on Communications (ICC), Shanghai, China, March 2019.
- Recipient of the **Institute** (Indian Institute of Technology Kharagpur) **Travel Grant** for presenting paper in the IEEE Global Communications Conference (GLOBECOM), Abu Dhabi, UAE, December 2018.
- Recipient of the **TCS** (Tata Consultancy Services) **Research Travel Grant** for presenting poster in the IEEE Wireless Communications and Networking Conference (WCNC), Barcelona, Catalonia, Spain, April 2018.
- Recipient of the **Institute** (Indian Institute of Technology Kharagpur) **Full Financial Grant** for presenting paper in the 6^{th} IEEE International Conference on Cloud Computing Technology and Science (CloudCom), Singapore, December 2014.
- Recipient of the **Institute** (Indian Institute of Technology Kharagpur) **Full Financial Grant** for presenting paper in the 11^{th} IEEE India Conference on Emerging Trends and Innovation in Technology (INDICON), Pune, India, December 2014.
- **Winner** in *Poster presentation* on the 6^{th} Research Scholars' Day 2015 of School of Information Technology, Indian Institute of Technology Kharagpur.
- Recipient of the **Merit scholarship** by Government of India Ministry of Human Resource Development Department of Higher Education based on performance in Higher Secondary Examination.
- Recipient of the **Merit scholarship** by Government of India Ministry of Human Resource Development Department of Higher Education for exemplary performance in Secondary Examination.
- **Ranked** 3^{rd} and 49^{th} in *Secondary Examination* from District - North 24 Parganas, West Bengal, India and State - West Bengal, India, respectively.

Administrative Responsibilities

- **Organizing team member** of "Internet of Things: Theory & Applications", TEQIP-III, Indian Institute of Technology Kharagpur held on October 24-28, 2018.
- **Organizing team member** and Teaching Assistant of "Underwater Sensor Networks: Theory and Simulations", NPOL, Ministry of Defence, Kochi held on April 18-20, 2016.
- **Served** as *Departmental Research Scholar Representative* of School of Information Technology, Indian Institute of Technology Kharagpur for academic year 2015-2016.
- **Organizing team member** of *AICTE/QIP Sponsored Short-term course* on "Internet of Things: Convergence of Sensing, Cloud and Big-Data Networking" at Indian Institute of Technology Kharagpur held on July 13-26, 2015..
- **Organizing team member** of *International Summer and Winter Term* (ISWT) *course* on "Enabling Internet of Things with Cloud and Big Data Networking" at Indian Institute of Technology Kharagpur held on May 25-June 7, 2015.
- **Served** as *Departmental Research Scholar Representative* of School of Information Technology, Indian Institute of Technology Kharagpur for academic year 2014-2015.
- **Elected** *Student Senate Member* (SSM) and *Vice-President* (VP) of Vikram Sarabhai Residential Complex (Hall), Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India for academic year 2014-2015.