

AYAN MONDAL

ayan.mondal@irisa.fr
<https://ayanmondal.github.io/>

Univ Rennes, Inria, CNRS, IRISA
Rennes, France

Professional Experience

- | | |
|--|--|
| <i>Distributed Stream processing on Fog and Edge Systems via Transprecise Computing</i>
Univ Rennes, Inria, CNRS, IRISA
Rennes, France
Sponsored by: European Union | October 2020 - Present
(Postdoctoral Researcher) |
| <i>FogCity: QoS-Aware Resource Management for Smart Cities</i>
Univ Rennes, Inria, CNRS, IRISA
Rennes, France
Sponsored by: IFCPAR/CEFIPRA | June 2018 - September 2018
(Visiting Researcher) |
| <i>An Indigenous Framework for Authenticity Integrity and Non-Repudiation in Data Communication</i>
Sponsored Research and Industrial Consultancy
Indian Institute of Technology Kharagpur, India
Sponsored by: DRDO, India | February 2016
(Senior Research Fellow) |
| <i>Development of feasibility assessment model for adaptation of underground coal gasification technology in the North-East Region of India</i>
Sponsored Research and Industrial Consultancy
Indian Institute of Technology Kharagpur, India Sponsored by: DietY, India | August 2014 – January 2016
(Senior Project Officer) |
| <i>Development of feasibility assessment model for adaptation of underground coal gasification technology in the North-East Region of India</i>
Sponsored Research and Industrial Consultancy
Indian Institute of Technology Kharagpur, India Sponsored by: DietY, India | August 2013 – July 2014
(Junior Project Officer) |
| <i>Development of feasibility assessment model for adaptation of underground coal gasification technology in the North-East Region of India</i>
Sponsored Research and Industrial Consultancy
Indian Institute of Technology Kharagpur, India Sponsored by: DietY, India | August 2012 – July 2013
(Junior Project Assistant) |

Research Interests

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

Education

- Doctor of Philosophy, TCS Fellow*, Department of Computer Science and Engineering
Indian Institute of Technology Kharagpur, India 2020
Thesis: *Traffic Engineering in Software-Defined Data Center Networks for IoT*
Supervisor: Professor Sudip Misra
- Master of Science (by Research)*, School of Information Technology
Indian Institute of Technology Kharagpur, India 2015
Thesis: *Distributed Energy Management in Smart Grid*
Supervisor: Professor Sudip Misra
Grade (out of 10): 9.73
- Bachelor of Technology*, Electronics and Communication Engineering
St. Thomas' College of Engineering and Technology 2012
West Bengal University of Technology, India
Grade (out of 10): 8.99
- Higher Secondary*, Pure Science
West Bengal Council of Higher Secondary Education, India 2008
Percentage: 84.57
- Secondary*,
West Bengal Board of Secondary Education, India 2006
Percentage: 92.00

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, October 2020. (Accepted)
- [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 6th 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 6th 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 Assistant

<i>Software Engineering Lab (CS29006)</i> Department of Computer Science and Engineering Indian Institute of Technology Kharagpur	January 2020 - July 2020
<i>Software Engineering Lab (CS29006)</i> Department of Computer Science and Engineering Indian Institute of Technology Kharagpur	January 2019 - June 2019
<i>Programming and Data Structures Lab (CS19001)</i> Department of Computer Science and Engineering Indian Institute of Technology Kharagpur	July 2018 - December 2018
<i>Software Engineering Lab (CS29006)</i> Department of Computer Science and Engineering Indian Institute of Technology Kharagpur	January 2018 - June 2018
<i>Wireless Ad-Hoc and Sensor Networks (IT60119)</i> Department of Computer Science and Engineering Indian Institute of Technology Kharagpur	July 2017 - December 2017
<i>Programming and Data Structures Lab (CS19001)</i> Department of Computer Science and Engineering Indian Institute of Technology Kharagpur	January 2017 - June 2017
<i>Wireless Ad-Hoc and Sensor Networks (IT60119)</i> Department of Computer Science and Engineering Indian Institute of Technology Kharagpur	July 2016 - December 2016
<i>Internet and Web-based Technologies (IT60102)</i> Department of Computer Science and Engineering Indian Institute of Technology Kharagpur	January 2016 – May 2016
<i>Underwater Sensor Networks: Theory and Simulations</i> Short-term Course NPOL, DRDO Sponsored by: DRDO	April 2016

Invited 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
25-27 June, 2020

Session Chair

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

Memberships

Institute of Electrical and Electronics Engineers (IEEE)
IEEE Communications Society
IEEE Computer Society
IEEE Information Theory Society
IEEE Young Professionals

Graduate Student Member

Association for Computing Machinery (ACM)

Graduate Student Member

Referee Services

IEEE 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

Technical Program Co-Chair

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:

- Recipient of the **HoT Topic Paper Award** in the 2nd 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 6th 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 11th IEEE India Conference on Emerging Trends and Innovation in Technology (INDICON), Pune, India, December 2014.
- **Winner** in *Poster presentation* on the 6th 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.

Achievements:

- **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, July 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, June 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, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India for academic year 2014-2015.
- **Ranked** 3rd and 49th in *Secondary Examination* from District - North 24 Parganas, West Bengal, India and State - West Bengal, India, respectively.