Curriculum Vitae

Dr. Ayan Mondal

ayan.mondal@irisa.fr; mondalayan12@gmail.com $\rm https://ayanmondal.github.io/$

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

Education

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

- 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)

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 Sponsored Research and Industrial Consultancy August 2014 – January 2016 (Senior Project Officer)

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 Sponsored Research and Industrial Consultancy

August 2013 – July 2014 (Junior Project Officer)

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 Sponsored Research and Industrial Consultancy

August 2012 – July 2013 (Junior Project Assistant)

Indian Institute of Technology Kharagpur, India Sponsored by: DietY, India

Publications

Journals

- [J20] S. C. Misra and A. Mondal, "FogPrime: Dynamic Pricing-Based Strategic Resource Management in Fog Networks," *IEEE Transactions on Vehicular Technology*, pp.1-10, July 2021. (Accepted)
- [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

[C15] N. Ahmed, A. Roy, A. Mondal, and S. Misra, "SDN-Based Link Recovery Scheme for Large-Scale Internet of Things," in *Proceedings of IEEE International Conference on High Performance Switching* and Routing (HPSR), Paris, France, June 2021, pp. 1-6. (Invited Paper)

- [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. DOI: 10.1109/IN-FOCOMWKSHPS50562.2020.9162868
- [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/IN-DICON.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/Cloud-Com.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/Cloud-Com.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

Book Chapter

[BC1] A. Mondal and S. Misra, "QoS-Aware Dynamic Flow Management in Software-Defined Data Center Networks," Software-Defined Internet of Everything, G. S. Aujla, S. Garg, K. Kaur, and B. Sikdar (Eds.), Internet of Things - Technology, Communications and Computing (Series), Springer International Publishing, Springer Nature, 2021 (Accepted)

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

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 Indian Institute of Technology Kharagpur

Topic: Jamming-Aware QoS Enhancement in Wireless Sensor Networks

2015 - 2017

Master of Science (by Research) Student

Aishwariya Chakraborty, Department of Computer Science and Engineering Indian Institute of Technology Kharagpur Topic: QoS-Aware Sensor-as-a-Service in Sensor-Cloud	2016-2018
Master of Technology Students	
Lakshmi S. Patel, School of Information Technology Indian Institute of Technology Kharagpur Topic: Energy Management in Smart Grid	2013-2014
Shukla Banik, School of Information Technology Indian Institute of Technology Kharagpur Topic: Energy Management in Smart Grid	2012-2013
Reena Tirkey, School of Information Technology Indian Institute of Technology Kharagpur Topic: Gateway Selection in Sensor-Cloud	2012-2013
Undergraduate Interns	
Argha Boksi, Department of Computer Science and Engineering National Institute of Technology Durgapur Topic: Smart Grid Communication	2018-2019
Pankaj Kumar, Department of Computer Science and Engineering National Institute of Technology Patna Topic: Software-Defined Data Center Networks for IoT	2017-2018
Swetha Khajjayam, Department of Computer Science and Engineering National Institute of Technology Durgapur Topic: Software-Defined Data Center Networks for IoT	2016-2017
P. V. Sudheer Kumar, Department of Computer Science and Engineering National Institute of Technology Durgapur Topic: Distributed Energy Management in Smart Grid	2015-2016
Abhishek Basu, Department of Computer Science and Engineering NRCC Institute of Information Technology, West Bengal University of Technology Topic: Energy Management in Smart Grid	2014-2015
Suman Kumar Ghosh, Department of Computer Science and Engineering NRCC Institute of Information Technology, West Bengal University of Technology Topic: Energy Management in Smart Grid	2014-2015

Conference Chairmanship

SIGNIS: Softwarized Next Generation Networks for IoT Services Co-located with IEEE GLOBECOM 2021 Madrid, Spain December 7-11, 2021

Workshop Chair

VNI: Virtualization for Enabling Next-Generation IoT Networks

Co-located with IEEE HPSR 2021

Paris, France

June 7-9, 2021

International Conference on Advanced Computing and Intelligent Engineering

Session Chair

Workshop Chair

(ICACIE) 2018 (Springer)

Siksha 'O' Anusandhan (Deemed to be University)

Bhubaneswar, India December 22-24, 2018

IEEE Students' Technology Symposium (TechSym) 2016

Track Co-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 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 (IIT Kharagpur) Full Financial Grant for presenting paper in the IEEE International Conference on Communications (ICC), Shanghai, China, March 2019.
- Recipient of the **Institute** (IIT 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** (IIT 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 (IIT 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, IIT 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 3rd and 49th 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, IIT 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, IIT 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 IIT 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 IIT Kharagpur held on May 25-June 7, 2015.
- **Served** as *Departmental Research Scholar Representative* of School of Information Technology, IIT Kharagpur for academic year 2014-2015.
- Elected Student Senate Member (SSM) and Vice-President (VP) of Vikram Sarabhai Residential Complex (Hall), IIT Kharagpur, Kharagpur, West Bengal, India for academic year 2014-2015.