

Samaresh Bera

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RESEARCH INTERESTS

Software-defined networking, Network function virtualization, 5G (and beyond), Cross-layer optimization, and Network slicing

EXPERIENCE

Assistant Professor, IIT Jammu

Dept. of Computer Science and Engineering

Dec. 2022 – Present

C. V. Raman Post-doctoral Research Fellow, IISc. Bangalore

Dept. of Electrical Communication Engineering

Jan. 2021 – Dec. 2022

Mentor: Prof. Neelesh B. Mehta

Post-doctoral Researcher, IISc. Bangalore

Centre for Networked Intelligence

Dec. 2020

Research Engineer, IISc. Bangalore

INRIA, Sophia Antipolis and Nokia Bell Labs, France

Jan. 2020 – Apr. 2020

PROJECTS/WORKSHOPS

- “Mobile Device Security and Malware Analysis”, funded by MeitY, Govt. of India, 2024, Amount: INR 400 Lakhs.
- “5G Use-Case Lab”, funded by DoT, Govt. of India, 2024, Amount: INR 57 Lakhs.
- “Reliable and Secure Network Slicing in 5G and Beyond Networks”, IIT Jammu, 2023-2026, Amount: INR 29.75 Lakhs.
- “Reliability and Latency-Aware Network Slicing and Resource Allocation for uRLLC in 5G Networks”, Funded by SERB, Govt. of India, Amount: INR 24 Lakhs.
- “Indo-Taiwan Bilateral Workshop on Cyber Security”, funded by DST, Govt. of India, 2023, Amount: 9.4 Lakhs.

EDUCATION

PhD, Indian Institute of Technology Kharagpur

Thesis: Software-Defined Networking for Internet of Things: Rule Placement and Routing

2020

Supervisor: Prof. Sudip Misra

MS (by Research), Indian Institute of Technology Kharagpur

Thesis: Distributed Pricing Policy and Energy Management in Smart Grid

2015

Supervisor: Prof. Sudip Misra

BTech, West Bengal University of Technology

Electronics and Communication Engineering

2011

TEACHING

Instructor/Coordinator: Computer Networks (CS-6-38(MO))	IIT Jammu	2025
Introduction to Computer Systems (CSC005P1M)	IIT Jammu	2023
Operating Systems (CSC031U3M)	IIT Jammu	2023, 2024
Information Security (CSC050P1M)	IIT Jammu	2022, 2023
Fundamentals of SDN and NFV (CSC070P6G)	IIT Jammu	2024, 2025

- **PhD:** three (ongoing)
- **MTech:** three (ongoing), one (completed)

PUBLICATIONS

Book

1. S. Misra and **S. Bera**, "Smart Grid Technology: A Cloud Computing and Data Management Approach", *Cambridge University Press*, Cambridge, UK, ISBN: 9781108566506, 2018 [\(link\)](#).

Journal

1. P. Khambooj, S. Pal, **S Bera**, S Misra, "QoS-aware Multipath Routing in Software-Defined Networks", *IEEE Trans. on Network Science and Engineering*, vol. 10, no. 2, pp. 723-732, 2023, [\(link\)](#).
2. C. R. Chowdhury, S Misra, C Mandal, **S Bera**, "SeamFlow: Seamless Flow Forwarding in Energy Harvesting-Enabled Access Points of SDWLAN", *IEEE Trans. on Sustainable Computing*, vol. 8, no. 1, pp. 94-108, 2023, [\(link\)](#).
3. **S. Bera**, S. Misra, N. Saha, and H. Sharif, "Q-Soft: QoS-aware Traffic Forwarding in Software-Defined Cyber-Physical Systems", *IEEE Internet of Things Journal*, 2021 (preprint), [\(link\)](#).
4. N. Saha, S. Misra, and **S. Bera**, "Q-Flag: QoS-Aware Flow-Rule Aggregation in Software-Defined IoT Networks", *IEEE Internet of Things Journal*, 2021 (preprint), [\(link\)](#).
5. **S. Bera**, S. Misra, and N. Saha, "Traffic-Aware Dynamic Controller Assignment in SDN", *IEEE Transactions on Communications*, vol. 68, no. 7, 2020, [\(link\)](#).
6. S. Misra and **S. Bera**, "Soft-VAN: Mobility-Aware Task Offloading in Software-Defined Vehicular Network", *IEEE Trans. on Vehicular Technology*, 2019, [\(link\)](#).
7. **S. Bera**, S. Misra, and A. Jamalipour, "FlowStat: Adaptive Flow-Rule Placement for Per-Flow Statistics in SDN", *IEEE Journal on Selected Areas in Communications*, vol. 37, no. 3, pp. 530-539, 2019 [\(link\)](#).
8. **S. Bera**, S. Misra, and M. S. Obaidat, "Mobi-Flow: Mobility-Aware Adaptive Flow-Rule Placement in Software-Defined Access Network", *IEEE Trans. on Mobile Computing*, 2018 [\(link\)](#).
9. N. Saha, **S. Bera**, and S. Misra, "Sway: Traffic-Aware QoS Routing in Software-Defined IoT", *IEEE Trans. on Emerging Topics in Computing*, 2018 [\(link\)](#).
10. **S. Bera**, S. Misra, S. K. Roy, and M. S. Obaidat, "Soft-WSN: Software-Defined WSN Management System for IoT Applications", *IEEE Systems Journal* vol. 12, no. 3, pp. 2074-2081, Sept. 2018 (**Best paper award 2019**) [\(link\)](#).
11. S. Misra, **S. Bera**, Achuthananda M.P., S. K. Pal, and M. S. Obaidat, "Situation-Aware Protocol Switching in Software-Defined Wireless Sensor Network Systems", *IEEE Systems Journal*, vol. 12, no. 3, pp. 2353-2360, Sept. 2018 [\(link\)](#).
12. **S. Bera**, S. Misra, and A. V. Vasilakos, "Software-Defined Networking for Internet of Things: A Survey", *IEEE Internet of Things Journal*, vol. 4, no. 6, pp. 1994-2008, Dec. 2017 [\(link\)](#).
13. **S. Bera**, S. Misra, and D. Chatterjee, "C2C: Community-Based Cooperative Energy Consumption in Smart Grid", *IEEE Transactions on Smart Grid*, vol. 9, no. 5, pp. 4262-4269, Sept. 2018 [\(link\)](#).
14. S. Misra, **S. Bera**, T. Ojha, H. T. Mouftah, and A. Anpalagan, "ENTRUST: Energy Trading Under Uncertainty in Smart Grid Systems", *Computer Networks (Elsevier)*, vol. 110, pp. 232-242, Dec. 2016 [\(link\)](#).
15. A. Samanta, **S. Bera**, and S. Misra, "Link-Quality-Aware Resource Allocation With Load Balance in Wireless Body Area Networks", *IEEE Systems Journal*, vol. 12, no. 1, pp. 74-81, Mar. 2018 [\(link\)](#).
16. S. Misra, **S. Bera**, T. Ojha, and L. Zhou, "ENTICE: Agent-Based Energy Trading with Incomplete Information in the Smart Grid", *Journal of Network and Computer Applications*, Vol. 55, pp. 202-212, Sept. 2015, [\(link\)](#).

17. **S. Bera**, P. Gupta, and S. Misra, "D2S: Dynamic Demand Scheduling in Smart Grid Using Optimal Portfolio Selection Strategy", *IEEE Transactions on Smart Grid*, Vol. 6, No. 3, pp. 1434–1442, Apr. 2015, [link](#).
18. **S. Bera**, S. Misra, and J. Rodrigues, "Cloud Computing Applications for Smart Grid: A Survey", *IEEE Transactions on Parallel and Distributed Systems*, Vol. 26, No. 5, pp. 1477–1494, 2015, [link](#).
19. S. Misra, **S. Bera**, and T. Ojha, "D2P: Distributed Dynamic Pricing Policy in Smart Grid for PHEVs Management", *IEEE Transactions on Parallel and Distributed Systems*, Vol. 26, No. 3, pp. 702–712, Feb. 2015, [link](#).
20. S. Misra, **S. Bera**, and M. S. Obaidat, "Economics of Customer's Decisions in Smart Grid", *IET Networks*, Vol. 4, No. 1, pp. 37–43, January 2015, [link](#).
21. S. Misra, **S. Bera**, A. Mondal, R. Tirkey, H. C. Chao, and 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, [link](#).

Conference & Workshop

1. W. Dev, **S. Bera**, and A. Tiwari, "Control-Plane Load Balancing and Auto-Scaling in 5G and Beyond Networks", in *Proc. IEEE ICOIN*, Jan. 2025.
2. S. Malik and **S. Bera**, "Security-as-a-Function in 5G Network: Implementation and Performance Evaluation", in *Proc. SPCOM*, Jul. 2024.
3. **S. Bera**, "Availability-Aware VNF Placement for uRLLC Applications in MEC-Enabled 5G Networks", in *Proc. IEEE ANTS*, Dec. 2023, [link](#).
4. **S. Bera** and N. B. Mehta, "Network Slicing in 5G Edge Networks with Controlled Slice Redistributions", in *Proc. IEEE/ACM/IFIP CNSM*, Oct. 2021, [link](#).
5. N. Saha, **S. Bera**, and S. Misra, "QoS-Aware Adaptive Flow-rule Aggregation in Software-Defined IoT", in *Proc. IEEE GLOBECOM*, Dec. 2018, [link](#).
6. **S. Bera**, S. Misra, and N. Saha, "DyamiTE: Dynamic Traffic Engineering in Software-Defined Cyber Physical Systems", in *Proc. IEEE ICC Workshop*, May 2018, [link](#).
7. **S. Bera**, S. Misra, M. S. Obaidat, "Mobility-Aware Flow-Table Implementation in Software-Defined IoT", in *Proc. IEEE GLOBECOM*, Dec. 2016, [link](#).
8. **S. Bera**, T. Ojha, S. Misra, M. S. Obaidat, "Cloud-based Optimal Energy Forecasting for Enabling Green Smart Grid Communication", in *Proc. IEEE GLOBECOM*, Dec. 2015, [link](#).
9. T. Ojha, **S. Bera**, S. Misra, and N. S. Raghuwanshi, "Dynamic Duty Scheduling for Green Sensor-Cloud Applications", in *Proc. IEEE CloudCom*, pp. 841–846, Dec., 2014, [link](#).
10. **S. Bera**, S. Misra, and M. S. Obaidat, "Energy Efficient Smart Metering for Green Smart Grid Communication", in *Proc. IEEE GLOBECOM*, pp. 2466–2471, Dec., 2014, [link](#).
11. S. Misra, A. Mondal, S. Banik, M. Khatua, **S. Bera**, and M. S. Obaidat, "Residential Energy Management in Smart Grid: A Markov Decision Process Based Approach", in *Proc. IEEE iThings/CPSCoM*, Aug. 2013, [link](#).

Book Chapter

1. S. N. Das, **S. Bera**, S. Misra, S. K. Pal, "Introduction to Wireless Sensor Networks", in Book "Soft Computing Applications in Sensor Networks", Editors: Misra and Pal, CRC Press, 2016, [link](#).

INVITED TALKS

- “Fast and Secure Packet Processing in 5G” at NIT Hamirpur, 2025.
- “SDN Routing for Vehicular Networks” at NIT Calicut, 2023
- “Network slicing in 5G edge networks” at CNI, IISc Bangalore, India, Nov. 2021
- “Software-defined networking for internet of things” at ICACIE, 2020
- “SDN: Rule placement and routing” at AICTE-sponsored short-term training program on “Computer Networking with SDN”, Bharati Vidyapeeth, Pune, India, 2020

HANDS-ON EXPERIENCE

- OSM Hackfest 13 on “5G Core Onboarding using Magma”, Jun. 13-17, 2022, Virtual.
- OSM Hackfest 12 on “VNF Onboarding using Kamailio”, Jan. 24-28, 2022, Virtual.
- OSM Mid-Release 11 Hackfest on “On-boarding 5G core network functions using OAI and OSM”, Sept. 13-17, 2021, Virtual.

AWARDS AND RECOGNITIONS

- **Senior Member**, IEEE
- **DST AWSAR award**, 2021
- Received **IEEE Richard E Merwin** Student Scholarship from the IEEE Computer Society, 2017.
- Selected as **Young Researcher** for attending 5th **Heidelberg Laureate Forum**, Germany, September 2017.
- Received **travel grant** from **Heidelberg Laureate Forum Foundation** to attend HLF 2017.
- Received **Merit Cum Means scholarship** from **Govt. of West Bengal**, 2007-2009.

OTHER ACTIVITIES

TPC Member	ICDCN-2020, IEEE TechSym-2016, IEEE ScalCom-2014
Reviewer (selected journals)	IEEE/ACM TNET, ACM CSUR, IEEE JSAC, IEEE TNSM, IEEE TCOMM, and IEEE TMC
IEEE Student Activity	Chair (2019), Vice-Chair (2017, 2018), Treasurer (2016) IEEE Student Branch, IIT Kharagpur
Membership	Senior Member of the IEEE and Member of the ACM
Conference Org. Committee Member	IEEE TechSym (2014 and 2016)

DECLARATION

I hereby declare that the information furnished above are true to the best of my knowledge.

May 1, 2025

Samaresh Bera