

Dr. Alakesh Kalita, SMIEEE

[EMAIL](#)[WEBSITE](#)[LINKEDIN](#)[GOOGLE SCHOLAR](#)

RESEARCH INTERESTS

Internet of Things, Computer Networks, AI/ML for Computer System, Edge Computing.

WORK EXPERIENCE

AUG'24-PRESENT



Assistant Professor

Indian Institute of Technology Dhanbad (IIT (ISM) Dhanbad)

Department of Mathematics and Computing

OCT'23-AUG'24



University Lecturer

Singapore University of Technology and Design (SUTD)

Courses:

- Python Programming Language
- Computer System and Engineering (Lab + Theory)
- Data-Driven World

APR'22-OCT'23



Research Fellow

National University of Singapore, Singapore

Supervisor: **Dr. Mohan Gurusamy**

EDUCATION

JAN'18 - MAY'22



Doctor of Philosophy

Indian Institute of Technology Guwahati, India

Department: Computer Science and Engineering

Thesis: Adaptive Resource Allocation for Faster Formation of 6TiSCH IoT Network. [PDF](#)

Supervisor: **Dr. Manas Khatua**

🏆 **Innovative Student Projects Award'22 from Indian National Academy of Engineering, India** (Indian National Award)

JULY'14 - MAY'16



Master in Technology

Assam Central University, India

Department: Computer Science and Engineering

🏆 **University Rank -2**

JUNE'08 - JUNE'12



Bachelor in Technology

Assam Don Bosco University, India

Department: Computer Science and Engineering

PUBLICATIONS

PATENTS

2. A. Kalita, "A System and Method for Improving the Performance of IEEE 802.15.4 and IEEE 802.15.4e standardized Internet of Things Networks". [Indian Patent Filed on 28/03/2025; Ref No: 202531029706]
1. A. Kalita, "An Internet of Things (IoT) enabled System and Process for real-time Monitoring of an Infant to Prevent Falling Off a Surface above Ground level". [Filed on 24/10/2024; Ref No: 202431081152]

JOURNALS

16. P. Joshi, A. Kalita, and M. Gurusamy, "Reliable and Efficient Data Collection in UAV based IoT Networks" in *IEEE Communications Surveys and Tutorials*, I.F: 34.1, 2025. (Accepted) [PDF](#)
15. A. Hazra, A. Kalita, M. Gurusamy, and D. Sah, "Potential of Zero-Touch Network Management in Industry 5.0: A Future Prospect" in *IEEE Internet Computing*, I.F: 3.7, vol: 28, no: 6, pp: 45 - 52, 2024. [PDF](#)
14. A. Kalita, and M. Gurusamy, "On-the-Fly Autonomous Slot Allocation in 6TiSCH-based Industrial IoT Networks", *IEEE Transactions on Industrial Informatics*, IF-12.34, vol: 20, no: 7, pp: 9365 - 9374, 2024. [PDF](#)
13. A. Hazra, A. Kalita, and M. Gurusamy, "Distributed Service Provisioning with Collaboration of Edge and Cloud in Industry 5.0", *IEEE Internet of Things Journal*, I.F: 10.6, vol. 11, no. 12, pp. 21885-21894, 2024. [PDF](#)
12. A. Hazra, A. Kalita, and M. Gurusamy, "Meeting the Requirements of Internet of Things: The Promise of Edge Computing", *IEEE Internet of Things Journal*, I.F: 10.6, vol. 11, no. 5, pp. 7474 - 7498, 2024. [PDF](#)
11. A. Hazra, P. Maurya, A. Kalita, S. Deb, M. Gurusamy, and V. G. Menon, "Cognitive Computing and Machine Intelligence in Fog-Cloud Infrastructure for Industry 5.0" in *IEEE Consumer Electronics Magazine*, I.F: 4.5, 2024 (Accepted). [PDF](#)
10. A. Kalita, A. Hazra, and M. Gurusamy, "Parrando's Paradox based Enhanced Beacon Transmission in 6TiSCH Networks", *IEEE Networking Letters*, IF-NA, vol. 5, no. 4, pp. 204-207, 2023. [PDF](#)
9. A. Kalita, M. Gurusamy, and M. Khatua "A Gaming and Trust Model based Counter Measure for DIS Attack on 6TiSCH IoT Networks", in *IEEE Internet of Things Journal*, IF=10.6, vol. 10, no. 11, pp. 9727-9737, 2023. [PDF](#)
8. A. Kalita and M. Khatua, "Time-Variant RGB Model for Minimal Cell Allocation and Scheduling in 6TiSCH Networks," in *IEEE Transactions on Mobile Computing*, IF-7.9, vol. 23, no. 2, pp. 1803 - 1814, 2023. [PDF](#)
7. A. Kalita and M. Khatua, "6TiSCH – IPv6 Enabled Open Stack IoT Network Formation: A Review," in *ACM Transactions on Internet of Things*, IF-2.7, vol. 3, no. 24, pp. 1-36, 2022. [PDF](#)
6. A. Kalita, A. Brighente, M. Khatua, and M. Conti, "Effect of DIS Attack on 6TiSCH Network Formation," in *IEEE Communications Letters*, IF-3.55, vol. 26, no. 5, pp. 1190-1193, May, 2022. [PDF](#)
5. A. Kalita and M. Khatua, "A Non-cooperative Gaming Approach for Control Packet Transmission in 6TiSCH Network," in *IEEE Internet of Things Journal*, IF=10.6, vol. 9, no. 5, pp. 3954-3961, 2022. [PDF](#)
4. A. Kalita and M. Khatua, "Adaptive Control Packet Broadcasting Scheme for Faster 6TiSCH Network Bootstrapping," in *IEEE Internet of Things Journal*, IF=10.6, vol. 8, no. 24, pp. 17395-17402, 2021. [PDF](#)
3. A. Kalita and M. Khatua, "Autonomous Allocation and Scheduling of Minimal Cell in 6TiSCH Network," in *IEEE Internet of Things Journal*, IF=10.6, vol. 8, no. 15, pp. 12242-12250, 2021. [PDF](#)

2. A. Kalita and M. Khatua, "Opportunistic Transmission of Control Packets for Faster Formation of 6TiSCH Network," in [ACM Transactions on Internet of Things](#), IF-2.7, vol. 2, no. 1, pp. 1-29, 2021. [PDF](#)
1. A. Kalita and M. Khatua, "Channel Condition Based Dynamic Beacon Interval for Faster Formation of 6TiSCH Network," in [IEEE Transactions on Mobile Computing](#), IF-7.9, vol. 20, no. 7, pp. 2326–2337, 2021. [PDF](#)

CONFERENCES

15. A. Kalita, "6TiSCH-Sim: an Efficient Simulator and Cell Scheduling Scheme for 6TiSCH Industrial IoT Networks" in IEEE National Conference on Communications (NCC'2025). (Accepted)
14. V. Tummala, A. Hazra, A. Kalita, M. Gurusamy, "Cluster Based Pseudo Hierarchical Decentralized Federated Learning in UAV Networks" in IEEE 99th Vehicular Technology Conference (VTC-Fall'2024). [PDF](#)
13. P. Joshi, A. Kalita, M. Gurusamy, "Securing the Skies: An IRS-Assisted AoI-Aware Secure Multi-UAV System with Efficient Task Offloading" in IEEE 99th Vehicular Technology Conference (VTC), 2024, Accepted. [PDF](#)
12. V. Tummala, A. Hazra, A. Kalita, M. Gurusamy, "Efficient Task Offloading through Federated Learning in UAV-Assisted Edge Networks" in IEEE 99th Vehicular Technology Conference (VTC), 2024, Accepted.
11. A. Kalita, A. Hazra, and M. Gurusamy, 'RIM: Reputation-Based Incentives for Optimizing Service Pricing in Metaverse', In Proc. of IEEE Future Networks World Forum, USA, Baltimore (FNWF), 2023. [PDF](#)
10. V. Sebastiani*, A. Kalita*, and M. Gurusamy, 'Dynamic Resource Allocation and Pricing for Edge-Assisted Metaverse', In Proc. of IEEE Future Networks World Forum, USA, Baltimore (FNWF), 2023. [PDF](#)
9. A. Hazra, B. Mali, A. Kalita, and M. Gurusamy, 'Federated Learning for Cost Optimized Offloading in Edge-enabled Industrial Internet of Things', In Proc. of IEEE Future Networks World Forum, USA, Baltimore (FNWF), 2023. [PDF](#)
8. A. Hazra, A. Kalita, and M. Gurusamy, 'A Combined Approach of Industrial Edge Computing and Machine Learning for Predictive Maintenance', In IEEE GLOBECOM WKSHPS: AI/ML for Edge/Fog Networks program (GLOBECOM - A4E), 2023. [PDF](#)
7. A. Kalita, A. Hazra, and M. Gurusamy, "Efficient Schemes for Improved Performance in 6TiSCH Networks", In IEEE INFOCOM WKSHPS: The 10th International Workshop on Computer and Networking Experimental Research using Testbeds (INFOCOM - CNERT), 2023, [PDF](#).
6. A. Kalita and M. Khatua, "Opportunistic Priority Alternation Scheme for Faster Formation of 6TiSCH Network," In Proc. of the International Conference on Distributed Computing and Networking (ICDCN), 2020. [PDF](#)
5. A. Kalita and M. Khatua, "Faster Joining in 6TiSCH Network using Dynamic Beacon Interval", In Proc. of the International Conference on Communication Systems Networks (COMSNETS), 2019. [PDF](#)
4. A. Kalita, N. Ahmed, H. Rahman, and M. I. Hussain, "A QoS-aware MAC protocol for large-scale networks in Internet of Things," In Proc. of the International Conference on Advanced Networks and Telecommunications Systems (ANTS), 2017. [PDF](#)
3. A. Kalita, K. Ray, A. Biswas, and M. A. Hussain, "A topology for network-on-chip", In Proc. of the International Conference on Information Communication and Embedded Systems (ICICES), 2016. [PDF](#)
2. K. Ray, A. Kalita, A. Biswas, and M. A. Hussain, "A multipath network-on-chip topology", In Proc. of the International Conference on Information Communication and Embedded Systems (ICICES), 2016. [PDF](#)

1. A. Biswas, M. A. Hussain, and A. Kalita, "An improved congestion free modified fat tree network", In Proc. of the International Conference on Signal Processing, Communication, Power and Embedded System (SCOPES), 2016. [PDF](#)

BOOK CHAPTER

1. A. Hazra, P. Maurya, A. Kalita, I. Sarkar, "Offloading Strategies and Computing Paradigms in IoT: A Survey", in book "IoT Sensors, ML, AI and XAI: Empowering A Smarter World. Smart Sensors, Measurement and Instrumentation", vol 50. Springer. [PDF](#)

PRE-PRINT

1. A. Kalita, "Large Language Models (LLMs) for Semantic Communication in Edge-based IoT Networks", arXiv, 2024. [PDF](#)
2. A. Kalita and M. Gurusamy, "D2R2: Distributed and Dynamic Reputation based Resource Allocation in Metaverse", TechXiv, 2022. [PDF](#)

TECHNICAL REPORT

1. A. Kalita, "Contiki-NG, CC2650 IoT devices, and FIT IoT-LAB." [PDF](#)

SIMULATOR

1. A. Kalita, "6TiSCH Cell Allocation Simulator" [GitHub](#)

R&D PROJECTS

1. **Improving the Performance of 6TiSCH and DSME-based Internet of Things Networks**
Sponsor: ANRF
Scheme: Prime Minister Early Career Research Grant
Duration: 3 Years
Amount: Approx. 60 Lacs
Role: Principal Investigator
2. **Resilience in Low Power and Lossy Internet of Things Networks**
Sponsor: IIT (ISM) Dhanbad, India
Scheme: Faculty Research Scheme
Duration: October 2024 – October 2026
Amount: 19.89 Lacs
Role: Principal Investigator
3. **Establishing an IoT Testbed for Advanced Research in Computer Networks and AI-Enabled IoT Systems**
Sponsor: IIT (ISM) Dhanbad, India
Scheme: Special Grant to Establish Advanced Lab
Duration: October 2024 – October 2026
Amount: 12.3 Lacs
Role: Principal Investigator

AWARDS AND HONORS

- IEEE Senior Member
- Received Annual Performance Bonus (\$8000 SGD) from NUS, Singapore.
- Received Indian National Academy of Engineering (INAE) Innovative Student Projects Award (equivalent to best thesis) for Ph.D. Thesis work.
- Received travel grant to attend ICDCN'2020 conference from IIT Guwahati, India.
- Qualified UGC-NET (National Eligibility Test) for Assistant Professor (India).

- Received travel grant to attend COMSNETS'2019 conference from the conference organizer.
- Received MHRD scholarship during Ph.D. (2018-2022).
- Bagged second prize in Regional Innovators Conclave conducted by Government of Meghalaya for "Smart Lighting Model", Meghalaya, India 2017.
- Qualified GATE'2017.
- Secured First Class 2nd position with distinction in Master of Technology.
- Received TEQIP-II scholarship during M-Tech (2014-2016).
- Bagged first prize in line follower robotics competition in Assam University, India 2016.
- Awarded with *Anandaram Boruah Student Award*, 2006 for performance of 10th standard board examination by State Government of Assam, India.

MENTORSHIP

- **Jiang Jiaxu**, MSc (2024-2026), NUS-ECE (Ongoing),
- **Joshi Poorvi**, MSc (2023-2024), NUS-ECE,
- **Wu Xiaoxi** (2023-2024), MSc, NUS-ECE,
- **Valensia Sebastiani**, MSc (2022-2023), NUS-ECE.

PROFESSIONAL SERVICE

Resource Person

- Delivered a talk on "How Can We Make the Resource-constrained IoT Networks More Efficient and Use of LLMs in IoT Networks" at the Workshop on IoT, Robotics and AIML Workshop -2024, IIIT Sricity, India, on 12 December 2024.
- Delivered a keynote on "How to make the resource-constrained IoT networks more efficient?" at the Workshop on LPWAN-Based LEO Satellite Communication for 6G: Challenges, Innovations, and Future Directions, VTC 2024, Marina Bay Sands Hotel located at 10 Bayfront Avenue, Singapore, on 24 June, 2024
- Delivered an expert talk on "A Tutorial on 6TiSCH IoT Network", at the workshop on "Recent Trends in Information Technology, Networking, Communication and Healthcare" held in the department of CSE, Tezpur University, Assam, India, on 11-12 March, 2023.
- Delivered an expert talk on "Internet of Things", for the Project based Industrial Training on Blockchain, IoT and Machine Learning using Python, jointly organized by Central Institute of Technology Kokrajhar and NIELIT Guwahati, Assam, India, on 4 August, 2022.

Technical Program Committee Member

- Served as Session Chair for IEEE ANTS Workshop on Distributed Computing in 6G IoT Networks (6-DCIoT), IIT Guwahati, India.
- 2nd International Conference on Intelligent Computing Systems and Applications (ICICSA-2023), NIT Silchar, Assam, India
- 21st IEEE International Conference on Pervasive Intelligence and Computing (IEEE PICom 2023); Special Session on Distributed Machine Learning for Edge/Fog Computing: Challenges and Future Directions
- 1st IEEE International Conference on Computational Intelligence, Networks and Security (ICCINS-2023), Mylavaram, AP, India

Reviewer

- IEEE Transactions on Mobile Computing
- IEEE Internet of Things Journal

- IEEE Transactions on Vehicular Technology
 - IEEE Transactions on Service Computing
 - IEEE Engineering Management Review
 - IEEE Communications Standards Magazine
 - IEEE Communications Letter
 - IEEE Networking Letter
 - Wireless Communication and Networking (Springer)
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