

Atonu Ghosh

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Employment & Experiences

22/10/2020 – 31/12/2023

📌 **Junior Research Fellow** (22/10/2020 – 22/10/2022) and **Senior Research Fellow** (27/10/2022 – 31/12/2023), **Indian Institute of Technology Kharagpur** in MeitY sponsored research project entitled "TribeConnect: Integrated Smart Tribal Eco-Platform – A Proof of Concept in Chhattisgarh". Project TribeConnect aimed at the upliftment and empowerment of the tribal community through the application of IoT and Machine Learning in the fields of agriculture and healthcare.

➤ *IoT Platform.*

Development and deployment of a Django and MySQL based IoT platform for device management, live data visualization, and reporting.

➤ *IoT Hardware.*

Development and programming of microcontroller and microprocessor based IoT hardware for field data collection.

➤ *Low Power Intra-Village Communication.*

Development of a LoRa based intra-village messaging system in which the client devices sent messages using WiFi enabled devices and these messages were transmitted over a LoRa backbone network to reach the destination.

➤ *IoT Gateway.*

Design and development of an IoT gateway device that received data over multiple channels and transmitted to the remote IoT platform over GSM based Internet connection and received commands to actuate field devices.

➤ *Remote Access and Database Replication of IoT Gateways.*

Setting up of reverse SSH to remotely log in to Raspberry Pi based IoT gateways and enabling MariaDB replication to remote AWS EC2 instances and in-house servers.

➤ *Server Configuration and Management.*

Managed and configured blade servers to run reverse proxy using Nginx and Apache. Deployed and managed Dockerized web applications on these servers.

Employment & Experiences (continued)

01/03/2020 - Present

■ **System Architect**, SensorDrops Networks Pvt. Ltd., Indian Institute of Technology Kharagpur.

➤ *Intrusion detection system.*

Edge and Machine Learning (ML) based human intruder detection and GSM-based alert system.

➤ *Automated pipe coating thickness measurement system.*

Retrofitting Programmable Logic Controller (PLC) and hand-held gauge-based iron pipe coating thickness measurement system to automatically perform measurements and push the data to the PLC network.

➤ *Connected electrical power station.*

Retrofitting an electrical power station to fetch real-time data from multifunction meters, transmitting the data to the cloud to enable remote monitoring and alerts.

➤ *Connecting legacy gas sensor to the cloud.*

Retrofitting 4-20 mA-based gas sensors to realize a cloud-based IoT system for remote monitoring and alerts.

➤ *Warehouse condition monitoring.*

Building IoT system for real-time sensing of warehouse temperature and humidity for cloud-based display and alerts.

Instructor

January, 2024

■ Short Term Course on **Hands-on Introduction to Internet of Things with Machine Learning**, Indian Institute of Technology Kharagpur.

December, 2023

■ Security for Internet of Things, **Tata NeuSkills**.

■ Short Term Course on **Hands-on Introduction to Internet of Things with Machine Learning**, Indian Institute of Technology Kharagpur.

September, 2023

■ Short Term Course on **Introduction to Cloud Computing**, Indian Institute of Technology Kharagpur.

July, 2023

■ Short Term Course on **Hands-on Introduction to Internet of Things with Machine Learning**, Indian Institute of Technology Kharagpur.

April, 2023

■ Short Term Course on **Introduction to Cloud Computing**, Indian Institute of Technology Kharagpur.

April, 2022

■ Design and Development of Internet of Things Systems, **Unacademy**.

NPTEL Teaching Assistantship


January - April, 2024

■ **Introduction To Internet Of Things**, Prof. Sudip Misra, National Programme on Technology Enhanced Learning (NPTEL), Indian Institute of Technology Kharagpur.

July - October, 2023

■ **Introduction To Internet Of Things**, Prof. Sudip Misra, National Programme on Technology Enhanced Learning (NPTEL), Indian Institute of Technology Kharagpur.

Employment & Experiences (continued)

January - April, 2023  **Introduction To Internet Of Things**, Prof. Sudip Misra, National Programme on Technology Enhanced Learning (NPTEL), Indian Institute of Technology Kharagpur.

Institute Teaching Assistantship

Spring, 2024 - 2025  **Programming and Data Structure Laboratory**, Prof. Sudip Misra, Indian Institute of Technology Kharagpur.

Autumn, 2023 - 2024  **Programming and Data Structure Laboratory**, Prof. Sudip Misra, Indian Institute of Technology Kharagpur.

Spring, 2023 - 2024  **Programming and Data Structure Laboratory**, Prof. Sudip Misra, Indian Institute of Technology Kharagpur.

Autumn, 2022 - 2023  **Ubiquitous Computing**, Prof. Sudip Misra, Indian Institute of Technology Kharagpur.

Spring, 2022 - 2023  **Programming and Data Structure Laboratory**, Prof. Sudip Misra, Indian Institute of Technology Kharagpur.

 **Computer Networks Laboratory**, Prof. Sudip Misra, Indian Institute of Technology Kharagpur.

Autumn, 2021 - 2022  **Programming and Data Structure Laboratory**, Prof. Sudip Misra, Indian Institute of Technology Kharagpur.

Spring, 2021 - 2022  **Computer Networks Laboratory**, Prof. Sudip Misra, Indian Institute of Technology Kharagpur.

Education

2021 - Present  **Ph.D., Computer Science & Engineering**,
Supervisor: Prof Sudip Misra,
Indian Institute of Technology Kharagpur, West Bengal, India.

2020  **Master of Technology, Computer Science & Engineering**,
Maulana Abul Kalam Azad University of Technology (formerly WBUT), West Bengal,
India.
8.93 / 10

2017  **Bachelor of Technology, Computer Science & Engineering**,
Institute of Engineering & Management, West Bengal, India.
7.71 / 10

Patents

Filed

- 1 S. C. Misra, D. Das, S. Misra, V. Udutalapally, **A. Ghosh**, and T. Pan, "Wireless network device for wireless communication with user devices in a wireless communication network," Indian Patent, File No.: 202311028663, Apr. 20, 2023.
- 2 **A. Ghosh**, S. Misra, A. Roy, and A. Mukherjee, "A system for remote monitoring, actuation and data prediction," Indian Patent, File No.: 202231040824, Jul. 17, 2022.

- 3 S. C. Misra, D. Das, V. Udutalapally, S. Misra, N. Sengar, and **A. Ghosh**, "Blockchain-enabled iot system and method for securing real time data in a microcontroller-based blockchain network," Indian Patent, File No.: 202211070221, Dec. 6, 2022.
- 4 S. Misra, S. Pal, and **A. Ghosh**, "Modularized iot-based on-demand ambulatory hospital recommender system," Indian Patent, File No.: 202231008007, Feb. 15, 2022.
- 5 S. Misra, D. Das, V. Udutalapally, **A. Ghosh**, and P. K. Deb, "A secured edge-based automated power control and communication system for legacy iot infrastructures," Indian Patent, File No.: 202131038016, Aug. 23, 2021.

Research Publications

Journal Articles

- 1 **A. Ghosh**, S. Misra, V. Udutalapally, and D. Das, "Loraute: Routing messages in backhaul lora networks for underserved regions," *IEEE Internet of Things Journal*, pp. 1–1, 2023. [DOI](#): 10.1109/JIOT.2023.3281941.
- 2 **A. Ghosh**, S. Misra, and V. Udutalapally, "Multiobjective optimization and sensor correlation framework for iot data validation," *IEEE Sensors Journal*, vol. 22, no. 23, pp. 23 581–23 589, 2022. [DOI](#): 10.1109/JSEN.2022.3215993.
- 3 **A. Ghosh**, A. Mukherjee, and S. Misra, "Sega: Secured edge gateway microservices architecture for iiot-based machine monitoring," *IEEE Transactions on Industrial Informatics*, vol. 18, no. 3, pp. 1949–1956, 2022. [DOI](#): 10.1109/TII.2021.3102158.
- 4 **A. Ghosh**, R. Saha, and S. Misra, "Persistent service provisioning framework for iomt based emergency mobile healthcare units," *IEEE Journal of Biomedical and Health Informatics*, vol. 26, no. 12, pp. 5851–5858, 2022. [DOI](#): 10.1109/JBHI.2022.3172624.



Conference Proceedings

- 1 **A. Ghosh**, D. De, and K. Majumder, "A systematic review of log-based cloud forensics," in *Inventive Computation and Information Technologies*, Singapore: Springer Singapore, 2021, pp. 333–347. [DOI](#): 10.1007/978-981-33-4305-4_26.
- 2 **A. Ghosh**, K. Majumder, and D. De, "Android forensics using sleuth kit autopsy," in *Proceedings of the Sixth International Conference on Mathematics and Computing*, Singapore: Springer Singapore, 2021, pp. 297–308. [DOI](#): 10.1007/978-981-15-8061-1_24.
- 3 **A. Ghosh**, "Intelligent appliances controller using raspberry pi," in *2016 IEEE 7th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON)*, 2016, pp. 1–5. [DOI](#): 10.1109/IEMCON.2016.7746253.

Book Chapters

- 1 **A. Ghosh**, K. Majumder, and D. De, "A systematic review of digital, cloud and iot forensics," in *The "Essence" of Network Security: An End-to-End Panorama*, Singapore: Springer Singapore, 2021, pp. 31–74, ISBN: 978-981-15-9317-8. [DOI](#): 10.1007/978-981-15-9317-8_2.

Technical Skills

Solution Development	 Full Stack IoT Software and Hardware, Condition Monitoring, Hands on Cloud & Edge.
Coding	 Python, C, SQL.

Technical Skills (continued)

Databases	MySQL, SQLite, InfluxDB.
Web Dev	Docker, Django, Web API, HTML, CSS, JavaScript, Apache Web Server, NGINX.
Misc.	Academic research, Project proposal writing, Product architecting & development, Server and network configuration.

Miscellaneous Experiences

Reviewer

- IEEE Internet of Things Journal.
- Technical Reviewer for Apress Books.
 - Title: *Blockchain, IoT, and AI Technologies for Supply Chain Management*.
 - Title: *Build Your Own IoT Platform*.

Volunteering

November, 2022 - October, 2023	Secretary , IEEE Computer Society Student Branch Chapter, Indian Institute of Technology Kharagpur.
July, 2016 - Present	Google Local Guide.

Invited Talks

April, 2022	Workshop on Internet of Things , Maryland Institute of Technology & Management, Jamshedpur, India.
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References

Available on Request