

DEBARSHI ROY

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 LinkedIn |  GitHub |  Google Scholar

Kolkata, West Bengal - 700030, India

ACADEMIC EXPERIENCE

- **Indraprastha Institute of Information Technology Delhi [🌐]** *5th May, 2025 - 4th July, 2025*
New Delhi, Delhi, India
Research Intern in the Microbiome Informatics Lab of Computational Biology Department
 - I worked on a project titled '**Disease-Oriented Analysis of Human Microbiome Metadata: Toward LLM-Based Predictive Models**', which focuses on leveraging large language models (LLMs) to develop predictive frameworks based on disease-specific patterns in human microbiome metadata.
- **Indian Institute of Technology Guwahati [🌐]** *2nd January, 2024 - 20th December, 2024*
Guwahati, Assam, India
Former Research Assistant in the MARS Lab of Computer Science & Engineering Department
 - Worked for Teaching Assistant of the course "**Introduction to Computing**" (CS 101), Course Instructors: Prof. T. Venkatesh & Dr. John Jose, from January, 2024 - May, 2024.
 - Worked for Teaching Assistant of the course "**Digital Design & Computer Architecture**" (CS 322M), Course Instructor: Prof. Jatindra Kumar Deka, from July, 2024 - November, 2024.
 - [Experience Certificate](#)
- **Indian Institute of Science Education and Research Bhopal [🌐]** *22nd July, 2023 - 31st December, 2023*
Bhopal, Madhya Pradesh, India
Former JRF in the Electrical Engineering and Computer Science Department
 - Worked for Teaching Assistant Position for the course **Discrete Mathematics (ECS 201)**, Course Instructor: Dr. Kundan Kandhway.

EDUCATION

- **Indraprastha Institute of Information Technology Delhi** *July, 2025 - July, 2027*
New Delhi, Delhi, India
Master of Technology in Computational Biology
- **Maulana Abul Kalam Azad University of Technology** *June, 2019 - June, 2023*
Kolkata, West Bengal, India
Bachelor of Technology in Computer Science & Engineering
 - CGPA: 8.80/10.00
 - [Marksheets & Degree Certificate](#)
- **Chakdaha Ramlal Academy** *June, 2018*
Chakdaha, West Bengal, India
Higher Secondary Education (Class 12)
 - Marks (Percentage): 76%
 - [Marksheet & Certificate](#)
- **Gangnapur High (H.S.) School** *May, 2016*
Ranaghat, West Bengal, India
Secondary Education (Class 10)
 - Marks (Percentage): 90.57%
 - [Marksheet & Certificate](#)

PROJECTS

- **Project A: Machine Learning-based Age Prediction Model in gut microbial ageing-trajectories** *at IIIT Delhi*
Tools: [R, Python]
 - Developing machine learning frameworks (Random Forest, XGBoost) to predict physiological age using gut microbiome data across multiple age cohorts (20-40, 41-80, 60-80).
 - Analysing longitudinal aging trajectories to identify key microbial biomarkers, with Random Forest achieving the highest predictive accuracy for the 20-40 age demographic.
 - Performing rigorous data filtering and correlation analysis to map microbial abundance changes to healthy aging patterns.

• Project B: Disease-Oriented Analysis of Human Microbiome Metadata: Toward LLM-Based Predictive Models at IIIT Delhi

Tools: [R, Python, Pandas, NumPy, Seaborn, Matplotlib, SciPy]

- Designing a predictive framework that harnesses Large Language Models (LLMs) to interpret unstructured patterns in human microbiome metadata associated with various diseases.
- Utilizing Pandas and SciPy for the statistical processing and dimensionality reduction of complex biological datasets to ensure high-quality model inputs.
- Creating visualization pipelines (Seaborn, Matplotlib) to uncover latent relationships between metadata features and disease states.

• Project C: A Survey Towards Secure, Adaptive, and Scalable Prefetching

in Association with IIT Guwahati

Tools: []

- Prepared a survey report on various Prefetching Mechanisms in the context of Cache Prefetching, Hybrid Software-Hardware Prefetching and Operating Systems Prefetching w.r.t I/O Devices.

◦ Project Report

PATENTS AND PUBLICATIONS

C=Conference, J=Journal, P=Patent, S=In Submission, T=Thesis

[J.1] Debarshi Roy, Soumita Banerjee, Alisha Ansari, Sourav Goswami, Nidhi P. Raval, Kaustav Adhikary, and Tarini Shankar Ghosh (2026). **Artificial Intelligence (AI) in microbiome-directed biotherapeutics development**. *Progress in Molecular Biology and Translational Science*, Elsevier Inc. DOI: 10.1016/bs.pmbts.2026.01.005

[S.1] Debarshi Roy, Nidhi P. Raval, Vindhya Regonda, Omprakash Shete, Kaustav Adhikary, Deepak Kandhal, Shivangi Verma, and Tarini Shankar Ghosh (2026). **Overlapping signatures of gut microbiome in aging and disease: Enrichment of medication-associated oral-microbiome-predominant microbes in the gut**. Manuscript submitted for publication in *FEBS Letters*.

ACHIEVEMENTS

• GATE CS/IT 2023 Qualified

Scorecard Validity: till 31st March, 2026

Organized by IIT Kanpur

- During my GATE CS/IT Preparation, I prepared for all Core Computer Science Subjects according to the GATE CS/IT Syllabus.
- **GATE CS/IT Scorecard of 2023**

SKILLS

- **Programming Languages:** C, C++, Python, R

◦ **Specialized Area:** Biological Data Analysis, BioStatistics, Computational Metagenomics, Computational Genomics, Computer Organization & Architecture, Computer Networks, Operating Systems, DBMS

◦ **Other Tools & Technologies:** R Studio, gem5, Wireshark, Pandas, NumPy, Seaborn, Matplotlib, SciPy

◦ **Research Skills:** LaTex, PowerPoint, Excell, Word

VOLUNTEER EXPERIENCE

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Volunteer Role A

15th March, 2024 - 16th March, 2024



in Association with IIT Guwahati

* I worked as a Volunteer in "Workshop on Pedagogy Training for Teaching & Research Excellence" organized by The CSE Department of IIT Guwahati.

* Skills developed: Canva, PowerPoint, Photography.

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Volunteer Role B

21st June, 2024 - 3rd July, 2024



in Association with IIT Guwahati

* I participated as a Volunteer in "IEEE India Council supported IIT Guwahati Campus Immersion Program-2024", organized by The CSE Department of IIT Guwahati.

* Skills developed: Canva, PowerPoint, Photography, Management Capability organizing for a large program.

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Volunteer Role C

26th October, 2024



in Association with IIT Guwahati

- * I participated as a Volunteer to the **VLSI Society of India North-East Chapter** ingurated on 26th October, 2024, at IIT Guwahati, Assam.
- * Learned about a lot of things about the current semi-conductor developments among various industries in our country.

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Volunteer Role D

in Association with IIT Guwahati

15th - 18th December, 2024



- * I had the privilege of serving as an active volunteer at IEEE ANTS and AIORI(Advanced Internet Operations Research in India) - 1(co-located with IEEE ANTS), held at IIT Guwahati from 15th to 18th December, 2024.

ADDITIONAL INFORMATION

Languages:

- English (Professional working proficiency)
- German (Professional working proficiency)
- Hindi (Limited working proficiency)
- Bengali (Native or bilingual proficiency)

Hobbies: Cricket, Chess, Swimming, Drama

REFERENCES

◦ **Dr. Tarini Shankar Ghosh**

Assistant Professor, Department of Computational Biology
Indraprastha Institute of Information Technology Delhi, New Delhi-110020, India
Email: tarini.ghosh@iiitd.ac.in

Relationship: MTech Supervisor in IIIT Delhi

◦ **Dr. John Jose**

Associate Professor, Department of Computer Science & Engineering
Indian Institute of Technoloy Guwahati, Guwahati, Assam-781039, India
Email: johnjose@iitg.ac.in

Relationship: Supervisor in IIT Guwahati

◦ **Dr. Debraj Chatterjee**

Assistant Professor, Department of Computer Science & Engineering
Techno International, Newtown, Kolkata, West Bengal-700156, India
Email: debraj.chatterjee@tict.edu.in

Relationship: Guide & Mentor during Undergraduation

◦ **Dr. Tanmay Sanyal**

Assistant Professor, Department of Zoology
Krishnagar Government College, University of Kalyani, West Bengal-741101, India
Email: tanmaysanyal@gmail.com

Relationship: Guide & Mentor in various projects

ACKNOWLEDGEMENT

I affirm that the information provided in this Resume is true to the best of my knowledge and belief. I am prepared to provide necessary documentation or clarification if required.