




# DEBARSHI ROY

+91-7076750098 | [debarshi25178@iiitd.ac.in](mailto:debarshi25178@iiitd.ac.in)

 [LinkedIn](#) |  [GitHub](#) |  [Google Scholar](#) |  [Website](#)

Kolkata, West Bengal - 700030, India

## ACADEMIC EXPERIENCE

- **Indraprastha Institute of Information Technology Delhi**  5<sup>th</sup> May, 2025 - 4<sup>th</sup> July, 2025  
*Research Intern in the Microbiome Informatics Lab of Computational Biology Department* New Delhi, Delhi, India
  - 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**  2<sup>nd</sup> January, 2024 - 20<sup>th</sup> December, 2024  
*Former Research Assistant in the MARS Lab of Computer Science & Engineering Department* Guwahati, Assam, India
  - 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**  22<sup>nd</sup> July, 2023 - 31<sup>st</sup> December, 2023  
*Former JRF in the Electrical Engineering and Computer Science Department* Bhopal, Madhya Pradesh, India
  - 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  
*Master of Technology in Computational Biology* New Delhi, Delhi, India
- **Maulana Abul Kalam Azad University of Technology** June, 2019 - June, 2023  
*Bachelor of Technology in Computer Science & Engineering* Kolkata, West Bengal, India
  - CGPA: 8.80/10.00
  - [Marksheets & Degree Certificate](#)
- **Chakdaha Ramlal Academy** June, 2018  
*Higher Secondary Education (Class 12)* Chakdaha, West Bengal, India
  - Marks (Percentage): 76%
  - [Marksheet & Certificate](#)
- **Gangnapur High (H.S.) School** May, 2016  
*Secondary Education (Class 10)* Ranaghat, West Bengal, India
  - 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 IIT 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 31<sup>st</sup> 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

- **Volunteer Role A** 15<sup>th</sup> March, 2024 - 16<sup>th</sup> 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.
- **Volunteer Role B** 21<sup>st</sup> June, 2024 - 3<sup>rd</sup> 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.
- **Volunteer Role C** 26<sup>th</sup> October, 2024  
in Association with IIT Guwahati 

\* I participated as a Volunteer to the **VLSI Society of India North-East Chapter** inaugurated on 26<sup>th</sup> 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**

15<sup>th</sup> - 18<sup>th</sup> December, 2024

*in Association with IIT Guwahati*



\* 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 15<sup>th</sup> to 18<sup>th</sup> December, 2024.

### **ADDITIONAL INFORMATION**

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#### **Languages:**

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

**Hobbies:** Cricket, Chess, Swimming, Drama

### **REFERENCES**

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- **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](mailto:tarini.ghosh@iiitd.ac.in)  
*Relationship: MTech Supervisor in IIIT Delhi*
- **Dr. John Jose**  
Associate Professor, Department of Computer Science & Engineering  
Indian Institute of Technology Guwahati, Guwahati, Assam-781039, India  
Email: [johnjose@iitg.ac.in](mailto: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](mailto: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](mailto:tanmaysanyal@gmail.com)  
*Relationship: Guide & Mentor in various projects*

### **ACKNOWLEDGEMENT**

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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.