

# Tirthajit Baruah

PhD in Cyber Physical Systems, IISc  
BS-MS in Electrical Engineering and Computer Science  
(Minor in Data Science and Engineering), IISER Bhopal

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GitHub    Google Scholar

## EDUCATION

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
PhD	Indian Institute of Science, Bangalore	–	2023-Present
Bachelor of Science - Master of Science	Indian Institute of Science Education and Research, Bhopal	8.3/10	2018-2023
Senior Secondary	Army Public School Tezpur (CBSE Board)	90.1%	2018
Higher Secondary	Army Public School Tezpur (CBSE Board)	10/10	2016

## PUBLICATIONS

1. **T. Baruah**, P. Rathore, "*Translating Classifier Scores into Clinical Impact: Calibrated Risk and Queueing Simulation for AI-Assisted Radiology Worklist Triage*" Accepted at DAI & AIMedHealth @ Association for the Advancement of Artificial Intelligence (AAAI), Singapore, 2026. <https://openreview.net/pdf?id=OBR8CAFu9s>
2. A. Mazumder, C. Garg, **T. Baruah**, P. Rathore, "*DIME: Deterministic Information Maximizing Autoencoder*" Accepted at DeLTa @ International Conference on Learning Representations (ICLR), Singapore, 2025. <https://openreview.net/pdf?id=0jdELIT2VI>
3. A. Mazumder, **T. Baruah**, B. Kumar, R. Sharma, V. Pattanaik, P. Rathore, "*Learning Low-Rank Latent Spaces with Simple Deterministic Autoencoder: Theoretical and Empirical Insights*," Accepted at IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), Hawaii, 2024. <https://doi.org/10.48550/arXiv.2310.16194>
4. A. Mazumder, **T. Baruah**, A. Singh, P. Krishna, V. Pattanaik, P. Rathore, "*DeepVAT: A Self-Supervised Technique for Cluster Assessment for Image Datasets*," Accepted at ViPrior @ IEEE/CVF International Conference on Computer Vision (ICCV), Paris, 2023. <https://doi.org/10.48550/arXiv.2306.00011>
5. H. Wasnik, R. Gandhi, N. Patil, R. Behera, A. Golait, T. Patel, & **T. Baruah**, "*A Comprehensive Review of Molecular Biology and Genetics of Cataract*," International Journal for Research in Applied Sciences and Biotechnology, 8(2), 11-20. [doi.org/10.31033/ijrasb.8.2.2](https://doi.org/10.31033/ijrasb.8.2.2)

## KEY PROJECTS

- **Internship Project** Jun 2023 - Jul 2023  
Supervisor: Dr. Punit Rathore CPS, IISc Bangalore (Project Page)
  - Formulated a novel autoencoder (AE) architecture that gives low-rank latent space.
  - This architecture is then used for various downstream tasks like classification, clustering, and generative tasks, and it outperforms the baseline and SOTA autoencoders including generative AE's like VAE and Flow-based AE.
- **Master of Science Thesis Project** Aug 2022 - Apr 2023  
Supervisor: Dr. Prathosh AP ECE, IISc Bangalore
  - **Parameterized stochastic augmentations for Electronic Healthcare Records**
  - Develop Parametric augmentation techniques for Electronic Healthcare Records
  - Learn time series representations using self-supervised modeling and stochastic augmentation
  - Handling large-scale real-world electronic health record (MIMIC III, Physionet 2012)
- **Bachelor of Science Final Project** Dec 2021 - Apr 2022  
Supervisor: Dr. Haroon R Lone EECS, IISER Bhopal
  - **Calibrating Attention of Students in Classroom**
  - Studying the already used techniques and sensors (Galvanic, Electroencephalography, Visual)
  - Deploy Raspberry Pi module and camera to collect student data from the classroom
  - Train a real-time attentiveness detection model using the collected data and computer vision techniques
- **Summer Project: Water Rediscover** Apr - Jul 2013  
Project Instructor: Dr. Achintya N. Bezbaruah North Dakota State University
  - Developing wastewater management model for recycling them into potable water
  - Utilizing locally available techniques and plants (with cleansing property)

## EXPERIENCE

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- **Dept. of Cyber Physical Systems** *Jan - May 2025*  
IISc Bengaluru  
*Teaching Assistant: DA218o (Probabilistic Machine Learning: Theory and Applications)*
  - Conducting weekly programming tutorials for the topics taught in class
  - Assisting the instructor in formulating and evaluating assignments and exams
- **Dept. of Data Science and Engineering** *Aug - Dec 2022*  
IISER Bhopal  
*Teaching Assistant: DSE317/617 (Machine Learning)*
  - Delivering lectures on supplementary topics of the course
  - Mentoring and guiding students (Batch 2020/19) throughout the course
  - Assisting the instructor in formulating and evaluating assignments and exams
- **Dept. of Electrical Engineering & Computer Science** *Apr - May 2022*  
IISER Bhopal  
*Teaching Assistant: ECS102 (Introduction to Programming)*
  - Mentoring and guiding students (Batch 2021) throughout the course
  - Conducting lab sessions for assisting the students with their difficulty in assignments and course
- **Artificial Intelligence and Cyber Physical System for Agriculture @ iHub - AWaDH** *May - Jul 2021*  
IIT Ropar  
*Workshop, Instructor: Dr. Neeraj Goel*
  - Collecting agricultural data via sensors, deploying them to AI model training
  - Android app development for agricultural purposes
  - Capstone project: **“Real-time Pest Detection using MobileNet-SSD & Farm Monitoring”**

## TECHNICAL SKILLS

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- **Programming:** Python (PyTorch), Distributed Data Parallel, Linux
- **Hardware Tools:** ESP32, Arduino, Raspberry Pi, IoT sensors

## RELEVANT COURSES

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- **Mathematics:** Stochastic Modelling & Applications, Linear Algebra, Probability & Statistics, Calculus
- **Computer Science:** Data Structure & Algorithm, Discrete Maths, Internet of Things
- **Data Science:** Pattern Recognition & Neural Networks, Theory and Applications of Bayesian Learning, AI for Medical Image Analysis, Digital Image Processing
- **Biology:** Bio-molecules, Cell Biology, Biostatistics, Bio-informatics
- **Electrical and Electronics:** Signals & Systems, Principles of Communication, Electronic Devices, Electromagnetic Theory, Smart Sensing Technologies

## LANGUAGES

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- **English**, Full Professional Proficiency (**TOEFL-iBT score: 101/120**) *Oct 2022*
- **Hindi**, Native/Bilingual Proficiency
- **Assamese**, Native/Bilingual Proficiency

## POSITIONS OF RESPONSIBILITY

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- **Coordinator**, Karate Club, IISER Bhopal *2018 - 2021*
- **Prefect**, Students Council, Army Public School, Tezpur *2016*

## EXTRA-CURRICULARS

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- **Gold Medal:** Athletics 4\*100m relay, Inter IISER Sports Meet, 2022
  - **Visharad in Tabla:** 5-years classical training of tabla instrument
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