Parismita Das
Computer Science & Engineering
Indian Institute of Technology Bombay

22M0815
M.Tech.
Gender: Female
DOB: 29/01/1997

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2024	9.86
Graduation	IIT Guwahati	IIT Guwahati	2019	6.77
Intermediate	CBSE	Chanderbala Modi Academy	2015	91.80%
Matriculation	CBSE	Chanderbala Modi Academy	2013	10

WORK EXPERIENCE & INTERNSHIPS

- **Full Stack Developer** | ***ES Magico*** *(Jul'21 - Jul'2022)*
  - Implemented features for **3 startups** consisting end-to-end development from **designing to deployment**
  - Designed the admin panel and refer-and-earn module for Vidyakul, an E-learning app with **500k+ users**
  - Co-created **web application** for live-classes including chat module, teachers/students platform for Vidyakul
  - Developed the **database design** and **REST APIs** for Qriteek App, an anonymous rating platform
  - End-to-end development for UStart App, a social media platform targeting investors, startups & job seekers

  Tech Stack: ***NodeJS, MongoDB, typeORM, React, AdminBro, FirebaseDB, AWS S3, JWT Auth***
- **Google Summer of Code** | ***The R Foundation for Statistical Computing*** *(May'18 - Jul'18)*

  Project Title: ***MMIT (Maximum Margin Interval Trees)***
  - Built an **R package** with roxygen2 documentation, vignettes, unit testing via testthat, and CI with Travis
  - Created Max Margin Interval Trees, **Random Forests** and **Adaboost** modules using **Breiman's CART** concept
  - Implemented learning, prediction, visualization, **cross-validation**, **min cost-complexity pruning** for the above
  - Benchmarked with **28 datasets** and employed dynamic programming for optimal-split via **margin-based loss**
- **Summer Intern** | ***CitiCorp Services*** *(May'18 - Jul'18)*

  Project Title: ***TRIMS UI/UX Modernization and Feed Generation for Mexico.***
  - **Modernised UI/UX** and created a dashboard for TRIMS (Trade Information Management System)
  - **Feed Generation** to help makers and checkers for processing trade related documents for **Citi, Mexico**

MASTERS PROJECT & SEMINAR

- **XData: Automated Testing and Grading Software for SQL Queries.** *(May'22-Present)*

  (MTech Thesis | Advisor: ***Prof. S. Sudarshan****)*
  - **Objective**: Extending the Java Web-App for test data generation to check the correctness of SQL queries.
  - Added support for **multi level** nested sub-queries using **sub-query table approach** with **count attribute**
  - Modeled sub-query tables and correlation conditions for **where clause sub-queries** using Z3's Java APIs
  - Generalised the single level sub-queries implementation to accommodate any number of base relations
- **Integrating Z3's String Solver into XData via Java APIs** *(Jan'23-Apr'23)*

  (R&D I Project | Advisor: ***Prof. S. Sudarshan****)*
  - Enhanced application functionality by transitioning string literals from Z3's Enum to **Z3's string datatype**
  - Migrated XData's string solver to Z3's string solver using **Z3's Java APIs** supporting larger mutant space
  - Conducted **performance analysis** of the Z3's seq and z3str string solver along with XData's string solver
- **Literature Review on Autograding SQL Queries and Related Problems** *(Jan'23-Apr'23)*

  (Seminar | Advisor: ***Prof. S. Sudarshan****)*
  - Examined modules of **Z3, SMT solver by Microsoft** for constraints solving and modeling SQL constructs
  - Explored the **Partial Marking Algorithm** and **Test Data Generation Algorithm** of XData for SQL queries
  - Investigated the non-empty data test generation and query equivalence problem via **Cosette**, **SPES**, and **QEX**

KEY PROJECTS

- **Multi-Threaded Web Server** *(Aug'22-Dec'22)*

  (CS 744: Design and Engineering of Computing Systems, Instructor: ***Prof. Mythili Vutukuru*** *)*
  - Engineered a multi-threaded web server for processing **HTTP** requests using **master-worker thread pool**.
  - Devised a **closed-loop load generator**, computed performance and conducted **Valgrind**'s memory leak test
  - Analyzed performance metrics to measure the server's capacity yielding CPU as **performance bottleneck**
- **Simulation of Peer To Peer Cryptocurrency Network and Attacks** *(Jan'23-Apr'23)*

  (CS 765: Introduction to Blockchains, Cryptocurrencies and Smart Contracts, Instructor: ***Prof. Vinay Ribeiro****)*
  - Simulated a **P2P cryptocurrency** network with decentralized consensus(POW) using discrete-event simulator
  - Designed the **Selfish Mining Attack** and **Stubborn Mining Attack** on the P2P network event simulation
  - Deployed a **layer-2 Decentralized Application** (DApp) facilitating efficient P2P transactions using **Solidity**

- **Historical Data Analysis using Spark and Frequency-Based Ranking** *(Aug'22-Dec'22)*
  *(CS 631: Implementation Techniques for Relational Database Systems, Instructor: **Prof. S. Sudarshan**)*
  - Developed a **Spark** Program processing **37k+ events** to find the entity information from historical data
  - Utilized **frequency-based ranking** through **Map-Reduce** to assess entity's relevance and historical activities
  - Leveraged Spark's JavaRDD API to execute grouping, filtering, and aggregation tasks on a large dataset
- **Drugpedia, A Medicinal Information Web-App** *(Aug'22-Dec'22)*
  *(CS 699: Software Lab, Instructor: **Prof. Bhaskaran. Raman**)*
  - Co-Created **Flask Web-App** with **web-scrapping** techniques to extract, store and retrieve medicinal info
  - Implemented GitHub Actions for **CI** with **auto dependencies, linting, PEP8, unit tests, user/dev manuals**
- **Functional Dependency Framework in PostgreSQL** *(Aug'22-Dec'22)*
  *(CS 631: Implementation Techniques for Relational Database Systems, Instructor: **Prof. S. Sudarshan**)*
  - Built a comprehensive **global dependency table** encompassing table names and associated dependencies
  - Integrated **validation mechanism** that triggers on INSERT operation using **Server Programming Interface**
- **Modelling Business Process for House-Keeping Management Workflow**, *(Aug'22-Dec'22)*
  *(CS 770: Process Engineering, Instructor: **Prof. Rushikesh K. Joshi**)*
  - Designed a **Business Process Model** for house-keeping management using Camunda as the BPMN tool
  - Introduced the **worker-crew model** involving multiple actors & facilitating uniform work distribution

OTHER PROJECTS

- **The Economic Impact of AI Models: Case Study of ChatGPT in India** *(Jan'23-Apr'23)*
  *(PS 626: AI, Data and Policy, Instructor: **Prof. Anupam Guha**)*
  - Investigated the potential influence of **ChatGPT** on the **Indian labor market**, assessing its plausible impact
  - Utilized **data analysis** on **22k+ job listings** from **Naukri.com** and executed **job market research** surveys
  - Applied **Hierarchical Clustering** & topic modeling via **LDA** to find similar jobs and trends on Indian market
- **ML-Based Reconstruction of EM Shower and Neutral Pion π^0 Decay** *(Aug'17-May'19)*
  *(BTech Thesis | Advisor: **Prof. Bipul Bhuyan, IIT Guwahati**)*
  - Explored dimensionality reduction via **SVD & 2D/3D Hough** to detect lines representing the EM shower
  - Analyzed clustering algorithms **DBSCAN** & **Cone Fitting** to identify outliers for Invariant Mass Calculation
  - Optimally reconstructed the π^0 decay and EM shower using **3D Iterative Hough Transform and Cone Fitting**
- **Raman, The Humanoid | 4I Labs, IIT Guwahati** *(Aug'17-May'19)*
  - Led **15-member team** supervising design and AI modules securing **6.7 Lakh INR sponsorship by 4i-labs**
  - Co-created **Vision** Module consisting of Object Detection, Emotion Analysis, Face Recognition & Tracking

TECHNICAL SKILLS

- **Programming & Scripting Languages**: R, C, C++, Java, Python, Bash, SED, AWK
- **Web Tools**: HTML, CSS, JS, PHP, MySQL, PostgreSQL, NodeJS, Django, MongoDB, Flask
- **Tools & Libraries**: Spark, OpenCV, Scikit-Learn, Scipy, NLTK, Mallet, Git, LaTeX

KEY COURSES TAKEN

- **Computing Systems**: Implementation Techniques for Relational Database Systems, Design and Engineering of Computing Systems, Introduction of Blockchains, Cryptocurrencies, & Smart Contracts, Process Engineering
- **Data Science and ML**: Advanced Machine learning, Pattern Recognition & Machine Learning, AI, Data and Policy, Indexing, Retrieval and Learning for Text & Graphs *(ongoing)*, Foundations of Machine Learning *(ongoing)*
- **Others**: Game Theory and Economics, Human Resource Management, Organization Behavior

POSITION OF RESPONSIBILITY

- **Teaching Assistant** | *Responsibilities: Conducting tutorials, labs, doubt sessions, setting assignments and grading*
  - **CS 631:** Implementation Techniques in DBMS, *(ongoing)* — Instructor: **Prof. S. Sudarshan**
  - **CS 387:** Database and Information Systems Lab, — Instructor: **Prof. S. Sudarshan**
  - **CS 317:** Database and Information Systems Theory — Instructor: **Prof. Bernard Menezes**
  - **CS 293:** Data Structures and Algorithms Lab — Instructor: **Prof. Supratik Chakraborty**
- **Student Companion | Institute Student Companion Programme (ISCP), IIT Bombay** *(Jul'23-Present)*
  - Working in a team of **235+ coordinators**, ensuring a smooth transition of incoming first-year PG students
  - Mentoring **5 students** throughout the year and helping them on academic and non-academic fronts

EXTRA-CURRICULAR & ACHIEVEMENTS

- Successful **Open Source Contributions** at CloudCV - EvalAI, and R Foundation for Statistical Computing
- Awarded **AP Grade** in **AI Data & Policy** (Among 2 students out of 74), and **SPI 10/10** in Spring Semester, 2023
- Participated in the **Annual InSync Dance Show, IIT Bombay**, showcasing **Kathak** with a viewership of **1000+**
- Created an improv **painting** inspired by **The Swing by Jean-Honoré Fragonard** and several original artworks
- Administering a **fashion and travel**-focused Instagram account with **2.5k followers** and several **sponsored posts**