Saptarshi Majumder
Industrial Engineering & Operations Research
Indian Institute of Technology Bombay

19I190011
M.Sc.
Gender: Male
DOB: 12-01-1998

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2022	8.75
Graduation	University of Calcutta	St. Xavier's College	2019	71.04%
Graduation Specialization: Statistics				
Intermediate	CISCE	St. Xavier's Institution	2016	95.80%
Matriculation	CISCE	St. Xavier's Institution	2014	94.50%

Work Experience

Google Summer of Code | Ceph RGW SDK compatibility [Jun'21-Aug'21]
Mentor: Robin Johnson, Principal Cloud Architect, Digitalocean

- **Automated** the setup of running of Ceph S3-tests suite against the RGW of the Ceph distributed storage cluster
- **Developed a new tooling** that analyzes coverage of function signatures in **AWS Boto SDK** S3 source files against attributed suite of S3-tests and identifies segments of SDK with increased scope for testing coverage
- Extended support by developing a Proof-of-Concept of the coverage analysis tooling using Interval Trees on function signatures for **increased S3 compatibility testing** in the future on other SDKs maintained by AWS

University of Cambridge,England | Research Intern [May'20-Jul'20]
Paper: Depression Status Estimation by Deep Learning based Hybrid Multi-Modal Fusion Model
Guide: Prof. Juned Kadiwala, University of Cambridge

- **Co-authored and proposed** a novel hybrid deep learning approach for preliminary detection of mild depression which immensely helps in effective treatment of the common mental health disorder in all ages
- Achieved a benchmark test accuracy of **96.3%** and a robust AUC score of **0.9682** on the **NHS-DAIC dataset**
- Ideated and tested a **cross-platform mobile application** for collecting GDPR attributed in-patient data at various clinics across England and running the deployed model in the cloud against it for effective diagnosis

Key projects and Publication

EMRs with Blockchain:A distributed democratised EMR sharing platform
Publication: Springer LNCS Proceedings of the 4th International Blockchain Conference [July'21]

- Co-authored and implemented a **novel EMR sharing platform** on top of a Blockchain network to mitigate problems on non-repudiation, immutability and providing data-ownership for personlized treatment
- Proposed a new mechanism for storing **big data** in Blockchain Network by offshoring it to **IPFS**(Inteplanetary File System) swarm channels and store the connected keys of bi-level encrypted EMRs in PKCS#12 key-store

NLP in Audio analytics | MSc. Phase Project II [Jan'21-May'21]
Guide: Prof. Balamurugan Palaniappan, IIT Bombay

- Reviewed the literature on the application of Transformer models in NLP for learning audio representations
- Achieved a test accuracy of **83.57%** on a downstream task of keyword spotting through speech recognition on a subset of Google's speech-commands dataset using learned **Audio ALBERT** and Mockingjay representations

Lottery ticket Hypothesis [Sep'20-Dec'20]
Guide: Prof. Balamurugan Palaniappan, IIT Bombay | Course Project: Deep Learning - Theory & Practice

- Substantiated the existence of a significantly ($\geq 85\%$) pruned network having comparable accuracy with the original network validated over LeNet and Feed Forward MLP neural networks on the MNIST dataset
- Inspected the plausibility of transfer learning the lottery tickets over different datasets of the same domain

Classical Newsboy problem with uncertainty in supply— 105^{th} Indian Science Congress
Guide: Prof. Ayan Chandra, St. Xavier's College [2017-2018]

- One of 7 papers accepted for oral presentation in Mathematical Sciences at the 105^{th} Indian Science Congress
- Achieved an optimal order quantity for certain random demands with demands being associated with certain probability distributions, computing the same once for static or constant supply and once for random supply.

Decentralized decision making with blockchain as an enabler | MSc. Phase Project I
Guide: Prof. Nandyala Hemachandra, IIT Bombay [Aug'20-Dec'20]

- Reviewed the literature on the application of blockchain in smart transportation and supply chain networks
- Implemented a PoC for enabling decentralized decision making in microgrid based supply chain networks
- Proposed a blockchain-based solution for scaling ADAS and C-ITS transportation systems like Tesla's Autopilot

Hyperband:A Novel Bandit-based Approach to Hyperparamter Optimization [Jan'21-May'21]
Guide: Prof. Manjesh K. Hanawal, IIT Bombay | Course Project: Online learning

- Reviewed & implemented Hyperband, an improved version of Successive Halving (a robust, general purpose solution for non-stochastic best arm identification problem) to find optimal hyperparameter configurations

Blockchain in supply chain [Jan'21-May'21]
Guide: Prof.Narayan Rangaraj, IIT Bombay | Course Project: Quantitative Models for Supply Chain Management

- Formulated a model to enable the players in a multi-echelon supply chain to transact assets using blockchain
- Improved existing privacy concerns in supply chain solutions by introducing sub-networks and channels.

News Authenticity Detector with Online Learning [Jan'20-May'20]
Guide: Prof. Biplab Banerjee, IIT Bombay | Course Project: Machine Learning for Remote Sensing-I

- Validated the superiority of Passive-Agressive online algorithm over traditional ML models like **KNN,MNB**
- Achieved a test accuracy of **94.48%** using Passive-Aggresive online model on the **Kaggle BBC-News dataset**

Technical Skills

- **Programming Languages:** C, C++, Python, Javascript, Golang, Bash scripting, SQL , HTML, CSS
- **Tools and Technologies:** Docker, Kubernetes, Git, Microservices, AngularTS, Flutter, Apache Kafka, Tensorflow

Positions of Responsibility

PR Head and Core team member | IIT Bombay [March'21 - April'21]
Event: Inter-IIT Tech Meet 9.0

- Co-managed and resolved various logistical issues, team formations as part of a team of 15+ core members
- Achieved the **runners up** position among all IITs as part of a team of 76 members representing IIT Bombay

Placement Portal Development Team | IIT Bombay [March'20 - December'20]
Institute Placement team, IIT Bombay

- Selected in a core team of 6 members to ideate and develop a brand new placement portal for the institute catering to the needs of **2000+** students, coordinators and recruiters using a modern full-stack solution
- Systematically automated old portal functionalities, making the process more extensible and maintainable

Extracurriculars

- **Winners** in Table Tennis at the **PG General Championships 2019-2020**, IIT Bombay | Team IEOR member

Teaching Experience

Teaching Assistant | IIT Bombay [July '21- December '21]
Course: IE605: Engineering statistics

- Conducted weekly sessions (tutorial,doubt clearing) for **50+ students** in collaboration with other TAs
- Responsible for evaluation of assignments, answer scripts, organizing crib sessions to address various issues

Key Courses Undertaken

Machine Learning • Deep Learning-Theory Practice • Statistical ML & Data Mining • Online Learning
• Machine Learning for Remote Sensing-I • Foundations of Machine Learning •Modeling Computation Lab
Operations Research • IEOR Lab • Quantitative Models for Supply Chain Management • Optimization Techniques
Statistics • Probabilistic Models • Probability & Stochastic Processes •Engineering statistics • Linear Systems