EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2020	M.TECH Dual Degree 5Y	IIT Kharagpur	9.42 / 10
2014	All India Senior School Certificate Examination	Central Board of Secondary Education (CBSE)	97.8%
2012	All India Secondary School Examination	Central Board of Secondary Education (CBSE)	10 / 10

INTERNSHIPS

Samsung SDE Internship, SRI Bengaluru, May - Jul 2019
- Setted up **continuous delivery** pipeline for Samsung Pay Bill Pay Server Application using **GitLab CI/CD** tools.
- Installed **GitLab Runners** and created custom **Docker images** to run build and deploy stages of the pipeline.
- Created **shell scripts** to automatically build the package, build the image with the package installed, deploy the image on a remote machine and test for the application's health. Used Amazon Linux as base image for easy deployment of application on AWS servers.
- Setted up a local **Kubernetes** cluster with one master and one worker node and tested it by deploying pods for use as prototype for scaling up in production.

IBM Research Internship, IRL Bengaluru, May - Jul 2018
- Designed a **Decentralised and Trustless Data Marketplace for AI models** which preserves ownership of both Datasets and AI models simultaneously.
- Compared the system with existing AI marketplaces in terms of **security**, **privacy** and **scalability**.
- Implemented the system using smart contracts in **GoLang**, deployed the contracts on **Hyperledger** (blockchain layer) and ran **benchmark tests** using Python and Caliper (JavaScript).
- Implemented web APIs for users to interact with the network using **Hyperledger Composer.**

PROJECTS

Serverless Cloud Computing | Master's Thesis | Guide : *Prof. Sandip Chakraborty* | Jul 2019 - ongoing
- Designing a high-performance in-memory caching system for serverless distributed clouds, capable of supporting real-time applications.

POS Blockchain with Dynamically changing validators | Bachelor's Thesis | Guide : *Prof. Sandip Chakraborty* | Jul 2018 - Apr 2019
- Designed a novel **Proof of Stake Blockchain** system where the number of validators and transaction fees accrued from the users in a round is determined by **Market Dynamics** and varies with the number of transactions submitted in the system.

Distributed Directory Service | Term Project under *Prof. Arobinda Gupta,* Distributed Systems | Mar - Apr 2019
- Implemented a Distributed Directory Service in Python based on OSI LDAP Protocol using rpyc library for **Remote Procedural Calls** and ensured **One Crash Fault Tolerance** and **Sequential Consistency**.

Memory Resident File System and Virtual CPU Scheduler | Term Project under *Prof. Indranil Sengupta,* Operating Systems Lab | Mar - Apr 2018
- Implemented memory resident **UNIX-like** file system in C++ and wrote APIs to support **read & write** to its files, **create, modify & delete** files in it, **transfer** files between file system & disk and to **save and load** the file system itself from the disk.
- Implemented Virtual CPU scheduler using **POSIX Pthread library**, Virtual Memory Management simulator and functionalities of Unix Shell over linux kernel.

Transport Protocol Wrapper and Peer to Peer Chat Application | Term Project under *Prof. Sandip Chakraborty*, Networks Lab | Mar - Apr 2018
- Implemented APIs in C++ to provide **Slow Start Congestion Control** over Sliding Window ARQ protocol at application layer using **UDP** at transport layer.
- Developed P2P chat application over TCP supporting multiple chats simultaneously using **Select system call** and custom Ping application using **Raw Sockets** and ICMP query messages.

Assignment Schedule Management System | Term Project under *Prof. Shamik Sural,* Database Management Systems Lab | Feb - Apr 2018
- Developed a full stack **web-based application** and webview android app for use of instructors and students using **LAMP (Linux, Apache, MySQL, PHP) stack** which allowed users to see upcoming deadlines in the form of calendar and to generate statistics about assignments in courses.

Mini Matlab Compiler | Term Project under *Prof. Pralay Mitra,* Compilers Lab | Aug - Nov 2017
- Developed a compiler in C++ from scratch using **Flex** and **Bison** given lexical and phrase structure grammar specification of Matlab language following ISO 9899:1999 (E) standard to support basic arithmetic and matrix operations.

CERTIFICATIONS

ACM Summer School in ML and NLP | June 2017
- Got introduced to various ML techniques like **Decision Trees**, **SVMs**, **Neural Nets**, Bayes classifier, HMM, Distributional Semantics and their applications in NLP tasks like Part of Speech tagging, Named Entity Recognition, Information Retrieval, Text Mining, Machine Translation.
- Participated in Hands-on sessions and got familiarised with **Jupyter Notebook** and numpy, scipy, matplotlib, sklearn, nltk, tensorflow libraries in Python.

IEEE Image Processing Winter Workshop | Dec 2015
- Worked on basic image processing using **OpenCV** and implemented **noise filters**, **blob and edge detection**, **histograms**.
- Built a **Traffic Signal Detection** programme which outputs live directions to move in based on signal shown in input video and then tested it on a bot.

PUBLICATIONS

"Ownership preserving AI Market Places using Blockchain"
- *First author* of *Regular Paper* accepted in **2019 IEEE International Conference on Blockchain, Atlanta, USA** which was outcome of internship work at IBM.

AWARDS AND ACHIEVEMENTS

- Awarded **Student Par Excellence** Certificate by Computer Science and Engineering Department for the Academic year 2017-2018.
- Recipient of **Goralal Syngal Memorial Scholarship** for the Academic year 2016-2017.
- Recipient of **Technology Alumni Association Award** (Delhi Chapter) for the Academic year 2015-2016.
- Got **Department Changed** from Mechanical Engineering to Computer Science & Engineering with an **Institute rank** of **1** in 1st Year among 1300+ students.
- **Joint Entrance Examination 2015** - Secured AIR **206** (GEN) in Mains and AIR **1493** (GEN) in Advanced among 12.3 lakh+ students.
- Secured **State Rank** of **1** in Science Stream and became **Subject Topper** for scoring **100%** in Computer Science, Maths & Chemistry in AISSCE 2014.

SKILLS AND EXPERTISE

Proficient : C, C++, Python, MySQL, Java **| Intermediate :** HTML, PHP, GoLang **| Familiar :** JavaScript, Verilog, MIPS Assembly Language
Operating Systems : Ubuntu & CentOS (Linux - based), MacOS X (BSD - based), Microsoft Windows
Softwares/Tools : Kubernetes, Docker, Git, Jupyter, MXNet, Netbeans, LAMP Stack, Flex & Bison, OpenCV, MATLAB, Octave, Unity
Relevant Courses Taken : Distributed Systems, Operating Systems*, Computer Networks*, Database Management Systems*, Cryptography & Network Security, Software Engineering*, Compilers*, Formal Language & Automata Theory, Image Processing, Parallel & Distributed Algorithms, Algorithms - I* & II, Programming & Data Structures, Deep Learning, Machine Learning, Artificial Intelligence, Probability & Statistics, Discrete Structures, Operations Research.
  (* Theory & Lab Components)