Abhijay Mitra

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EDUCATION

B.Tech	Institute	Grad Year	CGPA
Major → Electrical Engg. (Instrumentation) **Minor → Computer Science and Engg.**	IIT Kharagpur, India	2022	**8.92 / 10** **9.10 / 10**

INTERNSHIPS

Software Engineering Intern | Salesforce — Summer' 21

Project: TeleHealth Application

- Aimed to **recognize**, **analyze** and **store data automatically,** directly from **medical voice conversations**.
- Developed a prototype app for **healthcare registrars** that mitigated their role in **registering**, **updating** or **fetching patient details**.
- Worked on the NLP domain of automating storage of patient interactions. Automated the patient onboarding process, laid the groundwork by collection of patient demographics information and storage using FHIR standards in the HealthCare Organization.
- Executed automatic conversation with patient (through phone call) without any manual intervention from registrar except confirmation of the patient **data analyzed from the conversation** before saving the data, for update or new patient registrations.
- Integrated **Google Speech to Text** and **Einstein NER** APIs to eradicate requirements of any manual intervention in the process.
- Demonstrated the fully operational app to **SVP, Industries, Salesforce HQ** and the **leaders of Health Cloud, Salesforce India**.
- **Languages** used → Java, Javascript, **Frameworks** used → Spring Boot

Software Developer | Kharagpur Winter Of Code — Winter' 20

Project: Salesforce Batch to Delete Records

- **Created a Salesforce library** using **Apex** as well as **lightning components** to delete multiple records of objects through **batches**.
- **Custom conditions** for record deletion, along with the **number of records** to be deleted, and **batch size** could be specified, as per convenience depending on the other processes triggered while calling the batch deletion method, and was handled using **SOQL**.
- **Languages** used → Apex, SOQL, Javascript, SOSL, **Frameworks** used → Lightning Components

Problem Setting Intern | Algo Zenith — Winter' 20

- Developed **problem statements, descriptions and complete solution editorials** of **100 algorithmic programming problems**.

Software Engineering Intern | Proficient Vision Solutions — Winter' 19

Project: Real time HD video processing

- Aimed to **remove rain and fog** from **HD video streams** in **real time**.
- **Developed license for product** (encryption of machine details like MAC Id, hard disk id, date of installation) along with user provided details such as id, password, number of concurrent users, and unique details cameras to be granted access.
- Implemented the **RSA algorithm** from scratch for licensing the software, built the pre-processing steps of the fog removal code.
- Incorporated **histogram equalization** and **stretching**, in **CUDA C** to enhance speed of computation multiple folds.
- Successfully demonstrated the product live at **WBP Telecom Office** under foggy conditions generated by smoke from fire.

PROJECTS

Term Project | Natural Language Processing — Autumn' 21

Guide: Prof. Sudeshna Sarkar, Project: **Automated Query Processing from Passages**

- Implemented two methods for the task of **extractive question answering**, the rule based Question Answering for Reading Comprehensions (**QuARC**) and the pre-trained **BERT** model using **Levenshtein distance** as a metric.
- Achieved an accuracy of **61.90 %** using the QuARC model and an accuracy of **95.24 %** using the BERT model.

Term Project | Selected Topics in Algorithms — Spring' 21

Guide: Prof. Partha Bhowmick, Project: **Voronoi Diagram with Visual Restriction**

- Explored the paper on VRDV by Fan et al. **Formulated pseudocode** and researched on the **bounds** of **cardinality of V and E**.
- Illustrated analogy with **real life geometric applications** and **provided** intuitions to the algorithm and **drafted a report and slides**.

Project | **GEOMETRIC ALGORITHMS** **Summer' 21**

Guide: Prof. Partha Bhowmick, Project: **Triangle Voxelization**

- Developed a highly efficient C++ application using Brassenham algorithm to voxelize a 3-D triangle and display the result.

Term Project | **GENETIC ALGORITHM IN ENGINEERING PROCESS MODELING** **Spring' 21**

Guide: Prof. Nirupam Chakraborti, Project: **TSP (2-opt) using Simulated Annealing**

- Researched on **Simulated Annealing** and its use in finding an **exact solution** to the **Traveling Salesman Problem** in non polynomial time. **Improved time complexity** and rendered existing algorithms more efficient by applying **2-opt** heuristic in the **local search paradigm**. Mentioned about results and difference between initial and final **tour cost** in **report**.

COMPETITIONS

- **Won** the **InTurn Hackathon** organized by **Salesforce** for its interns. **2021**
- **Globally Ranked 311** in Round E in **Google KickStart** **2021**
- **Globally Ranked 70** in **April Lunchtime Division 2** organized by Codechef **2021**
- **Globally Ranked 42** in **Summer Code Challenge** held at Codechef **2021**
- Qualified for **Facebook Hacker Cup - Round 2**. **2021**
- **Globally Ranked 101 in June Cook-Off 2021 Division 2** organized by Codechef **2021**
- **Globally Ranked 443** in Round D in **Google KickStart** **2020**
- Qualified for **Facebook Hacker Cup - Round 2**. **2020**
- Finalist of **Overnite Kshitij IIT Kharagpur**, a night long **ACM certified** team competitive programming contest **2020**
- **Globally Ranked 5** in June Data Structure and Algorithms Contest and **10** in August Easy organized by **Hackerearth** **2020**

AWARDS and ACHIEVEMENTS

- **Expert** with max rating **1877** on Codeforces (id → abhj). **2021**
- **5 star** with max rating **2030** on Codechef (id → abhj). **2021**
- Have been **#1 on IIT Kharagpur Stopstalk Leaderboard** (id → abj) (Competitive Programming) for **over 2 years** **2021**
- Undertook a **Software Engineering Virtual Experience** provided by **JP Morgan Chase and Company** **2020**
- Secured All India Rank **2157** (**99.9 percentile**) in **JEE Advanced** **2018**
- Secured Rank **92 (99.9 percentile)** in **WBJEE**. **2018**

COURSEWORK INFORMATION

- **Computer Science**: Algorithms I*, Programming and Data Structures*, Selected Topics in Algorithms, Genetic Algorithms in Engineering Process Modeling, Computer Architecture and Operating System, Digital Signal Processing, Natural Language Processing, Cyber Physical Systems, Image Processing, Machine Learning, Big Data Processing, Principles of Programming Languages
- **Mathematics**: Probability and Stochastic Processes, Transform Calculus, Mathematics I, Mathematics II
- **Finance:** Financial and legal aspects of business, Market Microstructure
- **MOOCs**: Competitive Programmer's Core Skills | Saint Petersburg State University, Software Development Processes and Methodologies | University of Minnesota, Computer Vision Basics | University of Buffalo,Game Theoretic Solution Concept with SpreadSheets | Coursera, Number Theory and Cryptography | UC San Diego, Divide and Conquer Sorting and Searching and Randomized Algorithms | Stanford, Graph Search Shortest Paths and Data Structures | Stanford, Machine Learning | Stanford.
- **Trailhead**: Achieved Ranger status, the highest possible rank

SKILLS and EXPERTISE

Languages : C, C++, Java, Python, Kotlin, Apex, SOQL, SOSL, HTML5, CSS, MATLAB, CUDA C, Javascript, TypeScript, Octave, PHP, Assembly Language (AVR Micro - controller)

Platforms: Salesforce, Github, Heroku

Databases: PostgreSQL, MongoDB, MySQL

Frameworks: Spring, Spring Boot, Maven, Spring MVC, React JS, JQuery, Express JS, Hibernate, Bootstrap, Thymeleaf Lightning Web Components, Aura Components

Others: Git, REST API, Bulk API, SOAP API, Postman, XAMPP, SOAP UI, Node JS, Open CV, Software Development Life Cycle, AWS, Metamind Einstein, Amazon Comprehend, Google Cloud, Multithreading, Number Theory, Cryptography, Image Processing, Computer Vision, Parallel Programming, Web Development, Machine Learning, Competitive Programming, Amazon Web Services, Computer Architecture, Operating System, NP Algorithms

POSITIONS of RESPONSIBILITY

Technology Transfer Group (TTG), IIT KHARAGPUR (core team member) **2019 - 2020**

- Conducted several **IPR** (Intellectual Property Rights) Workshops, commercialised the patents of the institute under **Dean SRIC**.

Kshitij (KTJ), IIT KHARAGPUR (volunteer) **2018 - 2019**

- Conducted, invigilated and evaluated several olympiads and had hands-on experience on **Fest management**.

EXTRA CURRICULAR ACTIVITIES

- **Mentor | Student Welfare Group** - Guided 3 freshers of the Department of Electrical Engineering. **2020 - 2021**
- **Member | LBS Hall Chess Team** - Represented LBS Hall in inter-hall general championship. **2018 - 2019**
- **Member | LBS Hall Math Olympiad Team** - Participated in olympiads conducted by the Hall **2018 - 2019**
- **Tutor | Student Welfare Group** - Programming and Data Structures teaching and doubt clearing sessions **2018 - 2019**
- **Author | Quora** - Have written advisory answers related to JEE (over 0.7 million content views). **2018 - 2019**
- **Cadet | 3 Bengal Tech Air Squadron NCC** - Participated in weekly parades and received weapon training. **2018 - 2020**