

# Abhijay Mitra

Department of Electrical Engineering

Final Year Undergraduate at Indian Institute of Technology, Kharagpur

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## EDUCATION

B.Tech	Institute	Grad Year	CGPA
Major → Electrical Engg. (Instrumentation) Minor → Computer Science and Engg.	IIT Kharagpur, India	2022	8.98 / 10 9.10 / 10

## INTERNSHIPS

### Software Engineering Intern | SALESFORCE

Summer' 21

#### Project: TeleHealth Application

- Aimed to **recognize, analyse 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 Organisation.
- Executed **automatic conversation with patient** (through **phone call**) **without any manual intervention** from registrar except confirmation of the **patient data analysed 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**.
- Augmented the library by enabling the freedom of **choice of mode** of record deletion i.e. with **sharing or without sharing**.
- 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**.
- Wrote **clean working code in C++** and their corresponding I/O for easy understanding of students (batchmates, juniors and seniors)
- Covered topics like **Greedy algorithms, DP, Graphs, Square Root Decomposition, Segment Trees** in detail in editorials.

### 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 equalisation** and **stretching**, in **CUDA C** to enhance speed of computation multiple folds.
- Demonstrated the product at **WBP Telecom Office** under foggy conditions generated by smoke from fire.

## PROJECTS

### 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**.

### 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 **Travelling 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

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- Won the **InTurn Hackathon** organized by **Salesforce** for its interns. 2021
- Globally Ranked **70** in **April Lunchtime Division 2** organised by Codechef 2021
- Globally Ranked **42** in **Summer Code Challenge** held at Codechef 2021
- Globally Ranked **101** in **June Cook-Off 2021 Division 2** organised by Codechef 2021
- Globally Ranked **443** in Round D in **Google Kick Start** 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

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- **Expert** with max rating **1877** on Codeforces ( id → [abhi](#)). 2021
- **5 star** with max rating **2030** on Codechef ( id → [abhi](#)). 2021
- Have been **#1** on **IIT Kharagpur Stopstalk Leaderboard** (id → [abi](#)) (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 (99.88 percentile)** in **JEE Advanced** 2018
- Secured Rank **92 (99.91 percentile)** in **WBJEE**. 2018

## COURSEWORK INFORMATION

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- **Computer Science:** Algorithms I\*, Programming and Data Structures\*, Selected Topics in Algorithms, Genetic Algorithms in Engineering Process Modeling, Computer Architecture and Operating System
- **Mathematics:** Probability and Stochastic Processes, Transform Calculus, Mathematics I, Mathematics II
- **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

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- Languages :** C, C++, Java, Python, Kotlin, Apex, SOQL, SOSL, HTML5, CSS, MATLAB, CUDA C, Javascript, TypeScript, Octave, React JS, JQuery, PHP, Assembly Language (AVR Micro - controller)
- Platforms:** Salesforce, Github, Heroku
- Databases:** PostgreSQL, MongoDB, MySQL
- Frameworks:** Spring, Spring Boot, Maven, Spring MVC, Hibernate, Bootstrap, Thymeleaf Lightning Web Components, Aura Components
- Others:** Git, REST API, Bulk API, SOAP API, Postman, XAMPP, SOAP UI, 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

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

- Worked alongside a team of 18 members directly under the **Dean of Sponsored Research and Industrial Consultancy**.
- Conducted several **IPR** (Intellectual Property Rights) Workshops and commercialised the patents of the institute

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

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

## EXTRA CURRICULAR ACTIVITIES

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- **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