Aritra Mazumder

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Education

Shahjalal University of Science and Technology	**Feb '18 – March '23**
BSc, Computer Science and Engineering	*CGPA: 3.60/4.00 (Last two years' CGPA: 3.81/4.00)*

Work Experience

Blue Dot Intel 🔗 - *Remote, USA*   **Oct '23 – Present**
Software Engineer

- Developed a **Retrieval Augmented Generation (RAG)** pipeline for investment data analysis, utilizing **Pinecone** to store vector embeddings for efficient data retrieval.
- Built the full-stack architecture with **Next.js**, **MySQL** for data management, and **Tailwind CSS** for responsive design.
- Deployed the system on **AWS EC2**, using **Nginx** for reverse proxy and **Docker** for containerization.

Re:tune 🔗 - *Remote, USA*   **Sep '23 – Oct'23**
Software Engineer, short term contract

- Primarily worked on debugging existing issues on the **RAG** platform with **Next.js**.
- Successfully streamlined the support ticketing system and resolved known production bugs by around **20%**.
- Created documentation for multiple features and workflows.

Daricomma 🔗 - *Sylhet, Bangladesh*   **Mar '23 – Sep '23**
Software Engineer

- Designed a scalable backend using **Hasura** and **PostgreSQL**, handling over 40,000 users and over 200,000 questions.
- Implemented UI designs and backend connections using **Next.js**, built robust backend services using **NestJS**.
- Developed key system components including authentication, payments, and promotional codes, ensuring high efficiency.

International Islamic University Chittagong - *Chittagong, Bangladesh*   **Feb '23 – Nov '23**
Competitive Programming Trainer

- Trained university students in competitive programming and topics such as **Dynamic Programming, Dijkstra's Algorithm**, and **Computational Geometry**.
- Organized coding contests and provided one-on-one mentorship.

Roboadda - *Remote, Bangladesh*   **Dec '22 – May '23**
Competitive Programming Course Instructor

- **Designed** and **implemented** curriculum for the course.
- Explained core concepts such as **time and space complexity** to enhance coding efficiency.
- Covered essential algorithms and data structures (e.g., **sorting, searching, graphs, dynamic programming**).

Somadhan - *Remote, Bangladesh*   **Oct '19 – Oct '21**
Software Engineer, Part-time

- Developed an Android app using **Flutter**.
- Implemented backend API services with **Node.js** and **MongoDB** for optimal performance.
- Designed and created a responsive dashboard using **React.js**.

Research Publications

- **Exploring Optimal Placement of Head-based Hierarchical Marking Menus on Smartphones**, *Undergrad Thesis.* Supervised by *Dr. Mohammad Khalad Hasan (Assistant Professor, University of British Columbia, Canada)*, *Dr. Md Forhad Rabbi (Professor, SUST, Bangladesh)* and *Dr. Farida Chowdhury (Professor, BRACU, Bangladesh)* 🔗
  – This research investigated optimal methods for selecting and positioning secondary marking menus within a hierarchical menu system using head-based input on smartphones. The study implemented a cursor control system using computer vision methods and conducted empirical analysis to evaluate the impact of various design factors on target selection. Published at **The International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (EAI MobiQuitous 2023)**.

- **garNER at SemEval-2023: Simplified Knowledge Augmentation for Multilingual Complex Named Entity Recognition**. Collaborated with teams from *University of Lorraine* and *University of Malta* 🔗
  – This research introduced a knowledge augmentation method that enriches input sentences by retrieving entities from the Wikipedia API and appending their summaries. The system garNER was developed to address the challenges of the SemEval-2023 MultiCoNer task. Published at **The 17th International Workshop on Semantic Evaluation, 2023**.

Achievements

- **ICPC (International Collegiate Programming Contest) Asia West** Championship, 2021 **Finalist**.

- **5th** (**top 0.2%** out of 2500+ teams) in **ICPC Dhaka** Regional Contest 2021, **10th** (**top 0.4%** out of 2500+ teams) in **ICPC Dhaka** Regional Contest 2022.

- **Sylhet divisional champion** in ICPC Dhaka Regional 2021.

- **Top 10** in **4** inter university programming contests.

- Ranked **Candidate Master** in Codeforces, max rating **1932** (**Top 0.03%** globally out of **900,000** users, **Link**).

- **Top 1%** out of 27,500+ registrants in **Meta Hacker Cup** round 2, 2022. Qualified for round 3 as **top 500 globally (ranked 371st), top 10 in Bangladesh**. **Scoreboard**.

- Ranked **6*** in Codechef (max rating **2244**, old ratings system). **Top 10** in the country, **top 0.01%** in the world out of 1,000,000, **Link**).

- **Top 10** in the country in Leetcode (max rating **2191**, **Top 1%** in the world out of 500,000, **Link**).

- **Problem-setter** and **Judge** in **HackerEarth** December Easy '22, IIUC Inter University Programming Contest, **Sylhet Engineering College** Inter University Junior Programming Contest and **BCS** Original Contest.

- **Finalist** at **National High School Programming Contest**, 2016 (divisional- **1st** in quiz, **6th** in coding).

- **Top 10** in 10 language tracks, SemEval 2023: Multilingual Complex Named Entity Recognition.

- **Regional Finalist** at the HULT Prize Kathmandu Regionals, 2022.

Technical Outreach

Technical Blog ↗
- Notable articles include RAG systems for LLMs, and advanced string data structures.
- Topics span system performance testing, open-source guidelines, and technical deep-dives into modern software architectures.

Educational Video Content Creation ↗
- Creating bilingual (Bengali/English) educational content on computer science concepts.
- Current focus: system design fundamentals and competitive programming.

Projects

FindResearch.online ↗ | *Next.js, Typescript* | ***1000+** unique users per month*
- A web app that aggregates research papers from multiple sources with **DistilBERT** based **AI insights**.
- Has advanced filtering and **BM25**-based relevance sorting for efficient paper discovery.

Qualytics ↗ | *TypeScript*
- VS Code extension for visualizing code quality metrics of a codebase such as **Cyclomatic Complexity** and **Maintainability Index**.
- Features interactive charts and project-level analysis for TypeScript codebases.

Dynamic Programming Simulator ↗ | *JavaFX, JFoenix*
- A PC app that simulates 6 different types of **Dynamic Programming** problems such as **0-1 Knapsack** and **Edit Distance**.
- Has features such as controlling the speed of the simulation, play/pause, state details in text and more.

SonicAI ↗ | *Flask, TensorFlow, React.js*
- Web app for music genre, note and emotion classification.
- The classification task uses **Convolutional Neural Networks**.

Leadership and Responsibilities

SUST Competitive Programming Training Camp
Coordinator and Trainer, 2021-2023

CSE Department Appointed Programming Mentor
2019

Technical Skills

C, C++, Python, JavaScript, Java, React.js, Next.js, NodeJS, NestJS, Flutter, MySQL, PostgreSQL, Tailwind CSS