SOUMYAJYOTI MOHANTA

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Education

Indian Institute of Technology, Patna   **Aug. 2023 - May 2027**
B.Tech in Artificial Intelligence and Data Science   *CGPA: 8.65*

Senior Secondary (Class 12th)   **Apr. 2022 - May 2023**
Emmanuel Mission School Talwandi, Kota   *Grade: 88.8%*

Achievements

- **Silver Medalist, Inter IIT Tech Meet 14.0**: Ranked 2nd out of 23 IITs in the High-Prep "Agentic AI" challenge for developing Velora, a real-time market research intelligence platform powered by the Pathway streaming framework.
- **Selected among the Top 100 projects** for Google Solutions Challenge 2025.
- Achieved **3rd place** at the Mira Hackathon through the AI-Flowchart-App project   *AI-flowchart-app* - **Source Code**
- Rated as **Pupil** on **Codeforces** with a peak rating of **1251**.   **Profile link**
- **JEE Mains**: **Scored 99.43 percentile** in JEE MAINS exam
- **JEE Advanced**: Secured **AIR 3143** out of over 2 lakh candidates.

Projects and Experience

Velora (Inter IIT Tech Meet 14.0) | veloraml.tech - ***Source Code***   **Sep. 2025 - Dec. 2025**

- **Developed** an AI-native financial intelligence platform that transforms high-frequency market data, news feeds, and social sentiment into actionable, context-aware trading signals in real-time.
- **Architected** an end-to-end real-time news data pipeline using the **Pathway** streaming framework, implementing a **three-tier Medallion architecture** (Bronze, Silver, Gold) to ingest and refine GDELT event streams.
- **Deployed** a high-performance **Kubernetes** scraping cluster on GKE, achieving a throughput of **778 sites per minute** while optimizing resource costs to just $4/day.
- **Integrated a Vector Database** and implemented a custom **Model Context Protocol (MCP)** server to expose news and social media signals as tools for agentic reasoning, enabling context-aware retrieval for a deep research assistant.
- **Established** a full observability stack using **Prometheus and Grafana**, designing dashboards to monitor real-time system metrics, microservice health, and Kafka topic latency across the platform.

Causal-LLM (GPT-style) from Scratch | ***Source Code***   **Sep. 2025**

- Engineered a **lightweight causal transformer (GPT-style) model** in **under 500 lines of code** from scratch in PyTorch to demonstrate core autoregressive mechanics.
- Implemented a complete **training pipeline**, running for **5,000+ epochs** on a custom corpus, and an interactive inference engine featuring **nucleus (top-p) sampling**.
- Built all core components, including **multi-head self-attention** and **feed-forward blocks**, from PyTorch primitives, utilizing a **50,257-token** Hugging Face (GPT-2) tokenizer.

RL Agent in Unity (Deep Q-Learning) ***Source Code***   **Mar. 2025 - Jun. 2025**

- Created 4 autonomous reinforcement learning agents for a 2 vs 2 football simulation in Unity, enabling them to interpret a **336-dimensional observation space** for complex, strategic decision-making.
- Accelerated the training pipeline by parallelizing **12 game instances**, enabling agents to master defensive strategies and reach the stopping criteria **(a 10-minute stalemate) within 5 hours**.
- Engineered a time-penalty reward function to drive rapid goal-scoring, enabling agents to utilize **14 ray-cast inputs and a 3-branched action space** for nuanced control.

Soulscript – AI-Powered Mental Health Therapist (GenAI) | *Live App* | ***Source Code***   **Apr. 2025 - Jun. 2025**

- Developed a **full-stack Generative AI mental health platform** with **over eight AI-driven features**, offering an **affordable alternative to traditional therapy.**
- **Tech Stack**: Firebase, Supabase, FastAPI, Docker, Google Cloud Run, Vertex AI RAG, Google Places API, Google Translate API (75+ languages supported).
- Led the implementation of **multilingual support with over 75 languages**, **therapist locator**, **community blog**, **user settings**, and a **personalized reflection chatbot** using RAG-based architecture.
- Optimized frontend performance by reducing **bundle size to <250KB**, achieving **sub-0.5s load times** and significantly improving **SEO performance**.

Monumento (Google Summer of Code Contributor) | *Source Code*   **Dec. 2024 – Apr. 2025**
- **Contributed 20+ PRs and 42 commits** to an AR-integrated social app via GSoC, engineering **responsive Flutter UI/UX** for core screens across mobile, tablet, and desktop views.
- **Spearheaded** the migration of core social features from **Firebase to Appwrite** to enhance scalability, while resolving critical UI responsiveness and overflow issues in key components.

CodePeak (Full Stack Development) | *codepeak.snipermonkey.in* - *Source Code*   **Dec. 2024 – Mar. 2025**
- Directed a team of four to build and deploy CODEPEAK, an open-source initiative with over 1,200 active contributors.
- Engineered the complete backend infrastructure using MongoDB, Nginx, and **AWS (S3, CloudFront)** to ensure high availability and scalability for over 1,200 contributors.
- Introduced an **automated GitHub issues and PR tracker** that accelerated contribution workflows and improved **point allocation efficiency by 12%**.

AI Flowchart Generator (Full-Stack GenAI) | *Live App* | *Source Code*   **Dec. 2024**
- Developed a full-stack AI web application to **dynamically generate flowcharts** from natural language or code, streamlining logic visualization for developers.
- Architected the system with a **Python-based backend** for processing AI/LLM requests and a **TypeScript/React frontend** utilizing the **React Flow** library for graphical rendering.
- Designed and built the responsive user interface, handling complex state management for nodes and edges, and deploying the solution on **Vercel**.

TabNavi Password Manager (Cross-Platform) | *Source Code*   **Nov. 2024 – Jan. 2025**
- **Engineered a cross-platform password manager** using React Native and Firebase, implementing **AES-256 encryption, MFA, and biometric access** for high-integrity credential security.
- **Developed** utility features including **bulk password import and real-time data breach monitoring** to ensure proactive account protection across both local and cloud storage.

Custom Assembler and Emulator (C++/Computer Architecture) | *Source Code*   **Nov. 2024**
- **Developed a two-pass assembler in C++** to convert custom ISA assembly into machine-readable binary files with robust detection for unknown and duplicate label errors.
- Built a functional emulator providing **program traces, memory dumps, and execution analysis**, featuring comprehensive error handling for hardware-level segmentation faults.

OneIITP App (App Development) | Play Store | App Store   **Aug. 2024 - Jan. 2025**
- The official mobile application for IIT Patna students, with a user base of over 2,000.
- **Tools and technologies**: React Native, Firebase, GitHub Actions, Xcode Cloud, Microsoft-based authentication.
- **Features** include a live bus schedule, a blog, class timetables, an attendance tracker, an institute marketplace, an upcoming events calendar, auto-updating quick links, emergency contacts, a food outlet directory, and an admin mode.
- Designed and built the blog feature and resolved iOS-specific bugs to ensure a consistent user experience across platforms. Established an **automated CI/CD pipeline** using **GitHub Actions and Xcode Cloud** to streamline deployment, reducing the time to publish new app versions to under 30 minutes.

Technical Skills

Languages: Python, C, C++, JavaScript, TypeScript, SQL, Dart
Frameworks: Flutter, NumPy, Pandas, Matplotlib, Scikit-Learn, React, React Native, Streamlit, FastAPI
Technical Analysis: Devised and implemented algorithmic trading strategies for Bitcoin (BTC) and Ethereum (ETH) using historical data and technical analysis indicators.
Tools: Docker, Git, MongoDB, MySQL, Selenium, Nginx, Google Cloud Platform, Microsoft Azure, AWS, Firebase

Positions of Responsibility

- **Sub-Coordinator, NJACK - Dev and OS**   *Dec. 2024 – Present*
  Conducted **CodePeak** (a month-long Open-Source contribution program), Organized **HackMatrix** (an offline hackathon at IIT Patna) and volunteered for **BiharFOSS** hospitality which attracted more than 200 people.
- **Sub-Coordinator, Anime Club**   *Jul. 2024 – Present*
  Conducted **AnimeCon** during **Anwesha**, the Cultural Fest of IIT Patna which attracted more than 7000 people.