Soham Jyoti Mondal

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Motivated technology student with a strong academic record and experience collaborating in diverse teams, seeking to leverage analytical problem-solving and cross-functional communication. Deeply interested in financial markets and business analysis.

KEY SKILLS

- **Technical:** Data Analysis, Machine Learning (Computer Vision, NLP, Reinforcement Learning), Medical Image Analysis, Audio Processing, Data Mining, Web Scraping, CI/CD, Model Optimization, Wireshark
- **Languages:** Python (Advanced), Java, C++, SQL, Dart, C, Javascript
- **Frameworks:** TensorFlow, PyTorch, LangChain, Llama Index, GraphQL, FastAPI, Flask, LIDA, Mesop, Hugging Face
- **Professional:** Project Planning, Technical Documentation, Research Communication, Experimental Design, Cross-functional Collaboration, Problem-solving

EDUCATION

Vellore Institute of Technology, Chennai

B. Tech, Computer Science Engineering with specialization in AI & ML 2022 - 2026

- **CGPA (6 semesters):** 9.07/10.

EXPERIENCE

Pythian Technologies Pvt Ltd *May 2024 – August 2024*

GenAI intern

- **Maritime Risk Assessment System -** Collaborated to design a chatbot for a maritime risk assessment platform, enabling natural language queries and seamless information retrieval via GraphQL integration. Streamlined risk data access for business teams.
- **HR Chatbot for Data Automation -** Built a HR chatbot leveraging RAG techniques and prompt engineering. Implemented dynamic SQL query generation and data visualization capabilities for complex datasets to produce data-driven reports and visualize key HR metrics

Samsung R&D Institute Bangalore *July 2024 – Feb 2025*

Advanced Research Intern

- Explored and implemented various audio preprocessing techniques for body sound analysis, including audio-specific data augmentation and advanced filtering methods to improve the quality and accuracy of sound interpretation.
- Benchmarked the Constant Ensemble Distillation (CED) model, evaluating its performance on audio classification tasks. Trained the CED model on new datasets specifically focused on human body sounds, adapting it for specialized audio recognition.

PROJECTS

- **Smaller Segmentation Model Distilled from Mixture of Experts** – Developed a compact segmentation model using knowledge distillation from a modified UNETR model with a mixture of experts. Achieved a 46% reduction in inference time and a 75% decrease in model size, with only a 2% drop in Dice score. Evaluated tumor datasets, demonstrating effective horizontal scaling of models using Mixture of Experts and optimizing speed without compromising accuracy in medical applications.
- **Custom Reinforcement learning for Unity Game -** Implemented a reinforcement learning-based zombie spawner for my shooter game that dynamically adjusts zombie numbers and spawn locations based on real-time player health, position, and game state. This system uses a deep neural network and a custom reward function to keep gameplay balanced and engaging by adapting spawn strategies to different player scenarios.
- **Cryptographic Encryption Using Invertible Neural Networks** – Implemented a cryptographic system using INNs and normalizing flows. Key innovation introduced controlled randomness creating an avalanche effect, ensuring security while reducing computational overhead by 30 percent as compared to deeper neural network.
- **Multi-Platform Voter Sentiment Analysis** – Developed sentiment analysis system by scraping Twitter, Reddit, and Medium data, then applied RoBERTa for political discourse classification with geospatial mapping to identify swing demographics.
- **Hackathon Aggregator Backend API (KWoC)** – Built a comprehensive REST API during Kharagpur Winter of Code to aggregate upcoming hackathon data by developing custom web scrapers for multiple platforms including Devfolio and Devpost. Implemented automated data collection pipeline with structured endpoints for hackathon discovery and filtering.
- **Graph Neural Network for Course Recommendation -** Developed a graph neural network-based course recommendation system for corporate environments. Modeled relationships between employees, their course history, and hierarchical manager levels (H1 and H2) to generate personalized course recommendations.

PUBLICATIONS

- SMS Spam Detection and Filtering of Transliterated Messages - Published in *Intelligent Computing and Control for Engineering and Business Systems (ICCEBS)* (2023). Conducted a comprehensive survey of SMS spam detection techniques and identified key features that improve classification accuracy.
- The Evolution of Logistics: Role of AI in Enhanced Operational Efficiency and Risk Mitigation - Published in *Redefining Commerce and Management: New Paradigms for the Digital Age* (ISBN: 978-81-19368-52-5). Explored the integration of AI in logistics to optimize operational processes, enhance efficiency, and mitigate risks in modern supply chains.