Swapnendu Banik

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Summary

Innovative and impact-driven Computer Science undergraduate with a strong foundation in AI, IoT, and NLP. Experienced in building end-to-end ML/NLP systems using tools like Hugging Face, PyTorch, and MLFlow. Made 5+ real-world projects spanning healthcare, cybersecurity, and assistive technology, with deployments via FastAPI and Streamlit. Skilled in both technical problem-solving and agile project execution, with demonstrated success in competitive hackathons and internships.

Education

VIT Bhopal University, B.Tech (CSE)	CGPA: 8.67
DPS Ruby Park, Class 12 CBSE	86%
CPS Kalikapur, Class 10 ICSE	94%

Skills

Programming Languages: Python, SQL, Java, C++, Bash
ML/DL: SkLearn, PyTorch, Transformers, Feature Engineering, Hyperparameter Tuning, Early Stop
Data Science: Pandas, NumPy, Matplotlib, Seaborn, EDA, Statistics, Data Cleaning, Imputation, Dimensionality Reduction (PCA)
Computer Vision: OpenCV, PyTorch-based CNNs, Image Augmentation, Custom Dataset Training
Generative AI: LangGraph, Hugging Face Transformers, RAG Pipelines, Vector Databases (Chroma)
MLOps & Deployment: DagsHub, MLflow, Git/GitHub, CI/CD, Docker
Web & App Integration: FastAPI, Streamlit, Gradio, REST APIs
Soft Skills: Agile Development, Technical Communication, Critical Thinking, Project Management

Experience

Machine Learning Intern – PreProdCorp Jan 2024 – Feb 2024
Offered placement after securing 4th place in Buildathon 2024. Worked on agile-based ML pipelines involving Apache Kafka, Linux/WSL, and PySpark for data preprocessing. Built tree-based models and a Deep Q-Network for CartPole using reinforcement learning. Contributed to MLFlow/DVC-based full-stack workflows, and explored NLP via Hugging Face (DistilBERT, RoBERTa, GPT-2, T5). Also led sentiment analysis on Amazon Reviews with TF-IDF, Word2Vec, and fine-tuned models. Codebases: Internship Work — Exploring NLP [Certificate].

Projects

- **GenAI-Based Mini-CDSS:** Developed a Clinical Decision Support System integrating LLMs with Tavily Web Search for preliminary diagnoses and evidence-based practices. Utilized Streamlit and FastAPI for real-time medical interactions. [GitHub].
- **AgroSphere:** Developed a FastAPI application providing agricultural services such as crop recommendation, soil type detection, historical data interaction via LLMs, and weed detection. Leveraged custom pytorch models and APIs to assist farmers in making informed decisions. [GitHub].
- **IoT-Based Network Attack Predictor:** An ANN-based intrusion detection model for IoT healthcare traffic. Achieved 97.6% precision and 87.5% F1-score for non-attack class; deployed with FastAPI and Streamlit. [GitHub]
- **Sign Language Detection Prototype:** Built a prototype to recognize sign language gestures using ML. Currently under re-evaluation for performance improvements. [GitHub].
- **Upcoming Project – IoT-Based Dynamic Attendance Management System:** Designing a system to manage attendance dynamically based on time slots, leveraging IoT technologies for enhanced accuracy and efficiency.

Achievements

- Secured 4th place in Buildathon 2024 at VIT Bhopal; offered internship at PreProdCorp [Certificate]
- Secured 6th place out of 500+ teams in Johns Hopkins University HealthHack 2025 with VIT Bhopal [Certificate]