

Mirarani Choudhury

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Summary — AI/ML Engineer with overall **3 years of experience** in developing text-generation chatbots and **UAV route planning using RL Algorithm**. Contributed to a Zero Trust Network project, enhancing cybersecurity with **Trust score algorithms**. Proficient in Python, TensorFlow, Keras, PyTorch, and reinforcement learning.”

Technical Skills

AI/ML DeepLearning, Reinforcement Learning, PyTorch, NLP, TensorFlow, Matplotlib, Regression
GenAI/LLMs Langchain, LangGraph, VectorDatabase, RAG
Language Python

Professional Experience

IIT, MADRAS (Research Park)

June 2024 – Present

Machine Learning Engineer

Client: Aeronautical Development Agency, Bangalore

- Developed a UAV navigation model using reinforcement learning for obstacle avoidance in a simulated 2D environment, increasing mean reward by **25%** with PPO.
- Enhanced performance with **Artificial Potential Field (APF)** running on GPU, showcasing the solution to senior leadership with positive feedback.
- Developed and deployed a **PDF-based chatbot** using **LangChain, RAG pipeline, and deployed on Streamlit** enabling the organization to summarize documents and retrieve answers to queries efficiently. a predictive model for strain in wing attachments using flight parameters, applying PCA for dimensionality reduction and achieving R2 score 98% with a Random Forest Regressor on an aircraft dataset.

Center for Development and Advanced Computing, Bangalore

Jul 2023 – May 2024

DataScientist

- Developed and deployed machine learning models (**Random Forest SVM Regressor**) to predict trust scores, improving R² score from **96%to 98%**.
- Integrated real-time data flow into the Zero Trust model, leveraging **blacklisted data, threat intelligence, and data from 2000+ hosts** to continuously update trust scores. **Successfully identified and flagged anomalies from real-time network data, enhancing security posture and improving threat detection.**
- Utilized Scikit-learn, **AWS SageMaker, and Python** to implement solutions, enabling continuous trust score updates and real-time security monitoring.

Center for Development and Advanced Computing, Bangalore

Jul 2022 – June 2023

Project Trainee

- Designed a **Network Traffic Classification Architecture**, which identifies the anomalies in network data by using hyper-parameter tuning, **Random Forest and Decision Tree Classifier** and improved the accuracy to **99%**. Resulting in a published research Paper.
- Experimented with other advanced machine learning algorithms(**XGboost, ADA boost, SVM, KNN**) and deep learning algorithms(**LSTM, RNN**) using different loss functions and activation functions, **normalization method**.
- Developed a **time-series forecasting model** for energy demand using the **ARIMA algorithm** to optimize power generation and reduce energy waste during peak demand periods.

Education

National Institute of Technology, Durgapur

Aug 2021 – May 2023

M.Tech in Electrical Engineering(Power System) (Cgpa-8.55)

Cerifications

Certifications

- LangChain-Develop LLM-powered applications with LangChain -
(<https://www.udemy.com/certificate/UC-9acc27a2-3a23-48cc-a519-bc8088585185/>))
- Artificial Intelligence A-Z 2025: Build 7 AI+LLM ChatGPT(udemy.com)

Publications

Publications

- Network Traffic Classification Using Supervised Learning Algorithms - **April 2023** -
(<https://ieeexplore.ieee.org/document/10084931>)