Ayush Ranjan

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LeetCode

Skills

Languages: C++, C, R, JavaScript , Java, SQL,python

Technologies & Tools: Numpy,React.js , Node.js ,Django,RestFramework,Vscode , Github , MySQL,DeepLearning,CNN,Natural Language Processing,Gen AI

Work Experience

Bharat Electronics Ltd (Central Research Laboratory Ghaziabad)   Jan 2025 - july 2025

Software Engineer Intern (Research)

- Engaged in **research and development** to advance **Mobile Ad-Hoc Networks (MANETs)** at the network layer, specifically through the **optimization** of the **OLSR protocol** for enhanced **scalability and efficiency**.
- Engineered and implemented a **C++-based OLSR node** utilizing a **multi-threaded, event-driven architecture** (Packet Receive, Send, Timer, State Management threads) for high responsiveness,handling network communication via **UDP socket programming**..
- **Led the design and optimization** of the **Multipoint Relay (MPR) selection algorithm**, conducting in-depth **complexity analysis** ($O(N_{1,sym}^2 \times N_2)$ average case, $O(N^3)$ worst case) and implementing algorithmic enhancements.
- Developed and managed **core distributed routing information and protocol state** with rigorous **thread-safe access via mutexes and condition variables**, ensuring data integrity in a concurrent environment.
- Authored detailed **Software Design Documentation (SDD)** following **IEEE standards**, visually articulating the system's architecture, class designs, and dynamic interactions through comprehensive **UML diagrams**.

Education

National Institute of Technology, Jalandhar   2021 – 2025

B.Tech in Computer Science and Engineering

Relevant Coursework:Data Structures, Operating Systems , Object Oriented Programming , Computer Networks , Machine Learning , Cloud Computing , Database Management System ,Computer Vision ,Network Security

Project Work

- **Fake News Classifier using LSTM 2025:**
  - Developed an LSTM-based deep learning model to classify fake news articles with **89.17% accuracy**.
  - Preprocessed a dataset of **72,134 news articles**, handling missing values and performing text cleaning, stemming, and one-hot encoding.
  - Achieved a precision of **0.88** for real news and **0.90** for fake news, with recall values of **0.90** and **0.88** respectively.
  - Utilized Python with libraries such as TensorFlow/Keras, NLTK, and scikit-learn for model development and evaluation.
- **Agentic AI Chatbot with LangGraph**
  - Developed an Agentic AI Chatbot using LangGraph, featuring a "React" (Reasoning and Acting) architecture for complex query handling.
  - Engineered a dynamic workflow integrating multiple tools (Riff, Wikipedia, Tavily search) and Grok open-source models, allowing the AI to intelligently select the best tool for a task.
  - Implemented the core logic and state management, building a conversational graph with conditional edges for iterative reasoning between the LLM and various tools.
- **Guest House Booking System (2024):**Contributed to frontend of Full stack Guest House Booking site for **College as minor project** in 3rd year made using React.js ,Material UI , Node.js and Express.js to book rooms in Guest House .This includes User authentication, admin creation and session based access to the portal with REST APIs implemented on mongodb
- **Student Management System Project(2022):**Developed a File Handling system for Student Management using C++ file handling ,OOPs ,inheritance,Inbuilt-c++ modules enabling Teacher's ,student's and Admin Role based access to the system using basic Login/Signup authentication. Getting the student's marks and Teacher's information through unique id enabling CRUD operations on the database

Achievements

- **Ranked** within the **Top 1%** percentile among **1M+ JEE-MAIN 2021** candidates
- **Among Top 125 Teams out of 30000+** in **ZS Associates Campus Beats Tech Challenge 2023**
- **Amazon-FFE Scholar** (scholarship provided by FFE for meritorious students in STEM) 2022-Present.
- **Won PixelPerfect Website Designing Hackathon** organized by NIT Jalandhar, 2023.
- Attended SERB-sponsored 5-day workshop on **"Recent Advancements in Machine Learning 2023"** at IIIT UNA.