ADITYA TIMALSINA

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Education

Pulchowk Campus, IOE, TU   **Apr 2021 – 2025 (expected)**
*Bachelor of Electronics, Communication and Information Engineering; **83.86% (avg. so far)***   *Lalitpur, Nepal*

St. Xavier's College, Maitighar   **Apr 2020**
*+2 Science; **GPA: 3.79/4.00***   *Kathmandu, Nepal*

Experiences

Research Intern   **Oct 2024 - May 2025**
Duke University, USA and IOE Collab   *Remote*
- Worked with Prof. Dr. Henri Gavin for developing the machine learning model for the Earthquake Early Warning System.
- **Key Responsibility:** Designing and programming the deep learning model for the Earthquake Early Warning System.
- Used **Python** for dataset pre-processing, feature engineering, and model development.

Research Fellow   **Apr 2024 - Apr 2025**
Laboratory for ICT Research and Development (LICT)   *IOE, TU*
- Worked under Babu R. Dawadi, PhD and Prof. Dr. Pietro Manzoni for creating a 5G V2X Simulation System.
- **Key Responsibility:** Designing and programming of the simulation system for the implementation of different IoT Protocols.
- Used **C++** for implementing IoT protocols like **MQTT** and **ZeroMQ**.

Course Work and Certifications

ISC2   **Feb 2025**
Certified in Cybersecurity

Security Operations and Fundamentals   **Sep 2024**
Logpoint

Cyber Risk Management and Advanced security   **Mar 2025**
Logpoint

Projects

IPL Archive System | *Postgres, **Golang**, **React*** | ⊙ GitHub   **Aug 2023**
- Designed and implemented an SQL database for storing information about cricket players, matches, and teams for leagues like IPL using Postgres.
- Developed a backend in **Golang** for interfacing with the database.
- Designed the frontend web interface with forms for inserting data, and an interactive display of player and team stats using React.

Snake Game with Reinforcement Learning in Rust | *Rust* | ⊙ GitHub   **Jun 2024**
- Created a snake game that learns to play autonomously via reinforcement learning.
- Implemented core RL logic from scratch using simple reward mechanics and training loop.

IOExDuke Univeristy Deep Learning Model for Earthquake Early Warning System | *Python*   **May 2025**
- Created a deep learning model for the Earthquake Early Warning System.
- Performed dataset pre-processing, feature engineering, and model training.

Implementation MQTT and ZeroMQ for V2X Communication over 5G Networks | *C++, OMNET++* **May 2025**
- Implemented application layer IoT communication protocols: MQTT and ZeroMQ from scratch in OMNET++ environment.
- Created 5G topologies and various scenarios for vehicular communication through cellular network.

Real-Time Audio Filtering using FFT | *C, Raylib* | GitHub   **Sep 2024**
- Developed a program to apply Fast Fourier Transform (FFT) to real-time audio signals.
- Implemented frequency filters like low-pass, high-pass, and band-pass in a real-time setting.
- Used Raylib for audio handling and visualization.

Distributed Framework for Training a Neural Network in a LAN | *C* | GitHub   **Aug 2023**
- Implemented the SGD algorithm from scratch in C.
- Using Multithreading for parallel processing to improve performance.
- Created a networking interface using raw sockets in C.
- Implemented a workload distribution algorithm and synchronization for parallel training across nodes.

Ant Colony Optimization Visualizer for TSP | *JavaScript* | GitHub   **Aug 2024**
- Visualized Ant Colony Optimization applied to the Traveling Salesman Problem.
- Implemented interactive and animated path updates as ants search for optimal routes.
- Hosted live project ***here***.

Blockchain | *Golang* | GitHub   **Ongoing**

Technical Skills

Network and Security

- Deep understanding of networking protocols (TCP/IP, UDP, DNS, DHCP, HTTP, etc.)
- Strong knowledge of cybersecurity principles like Risk Management, access control, network security.

Databases

- Experience working with relational databases (SQL) and NoSQL databases, including data modeling and query optimization.

System Administration

- Proficient in Linux command-line operations, including scripting, process management, and system configuration.
- Strong understanding of operating system concepts such as process scheduling, memory management, system calls, and file systems.

Skills

Programming: C, **GoLang**, C++, **Rust**, **Python**, SQL, **JavaScript**, React, Assembly, Shell

Developer Tools: **UNIX Systems**, VS Code, **Git**, **GitHub**, **Docker**

Technologies/Frameworks: **Linux**, Raylib, OpenGL

Languages: Nepali (native), English, Hindi (basic)

Volunteer Works

IEEE LaTeX Workshop   **Jun 2024**
Instructor   *Pulchowk Campus, Nepal*
- Conducted a 3-day hands-on workshop on LaTeX organized by IEEE Student Branch, Pulchowk.
- Instructed over 100 participants on document structuring, typesetting, and report preparation.