# PAWAN MUGALIHALLI

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GitHub LinkedIn LeetCode CodeChef

## Education

**Bachelor of Technology in Computer Science Engineering**
*Indian Institute of Information Technology, Kottayam.* ***CGPA:8.95***
(Graduation: 2026) (as of Nov 2022 – Nov 2024)

**Higher Secondary Education (State Board)**
*Tirumala Engineering College, Vizag.* Percentage: **96.2%** (2021)

## Projects

**Riverside Clone – Real-Time Video Calling Platform** | *Java, Spring Boot, WebRTC, WebSocket, Google Cloud, MySQL, Docker* **(GitHub Link | Website)**

- Built a browser-based video calling platform with **real-time peer-to-peer** video/audio communication using **WebRTC**.
- Enabled **local media recording** with the MediaRecorder API and automatic upload to **Google Cloud Storage**.
- Leveraged **STOMP over WebSockets** for real-time signaling and session coordination between users.
- Implemented secure user authentication and access control with **Spring Security**.
- Designed **MySQL**-backed data persistence for user profiles, session metadata, and recording logs.
- Containerized the backend with **Docker** and deployed on **Google Cloud Run** for scalable, serverless execution.

**Mini 2D Metaverse with Gaming & Chat** | *Java, Spring Boot, WebSockets, PostgreSQL, Docker* **(GitHub Link | Website)**

- Built a **mini 2D metaverse** with **real-time multiplayer interactions**, integrating **Tic-Tac-Toe gaming** and a **chat system**.
- Leveraged **WebSockets over TCP/IP** for real-time communication, using **STOMP** for message brokering and game state synchronization.
- Developed a turn-based Tic-Tac-Toe game with automatic win detection and player matchmaking.
- Secured user authentication with Spring Security, ensuring safe access control.
- Integrated **PostgreSQL** for persistent storage of game sessions, chat history, and user data.
- Containerized the application with **Docker** and **deployed on Render**, ensuring scalability, high availability, and seamless updates.

**Transformer Network Implementation** | *Python, Pytorch.* **(GitHub Link)**

- Implemented a Transformer architecture from scratch using PyTorch
- Designed and implemented a Transformer model inspired by the "**Attention Is All You Need**" paper, incorporating core components such as multi-head self-attention, positional encoding, encoder-decoder layers, and masking mechanisms.
- The architecture consists of a **6-layer encoder-decoder structure, 8 attention heads**, and an **embedding size of 512**.
- Applied advanced techniques such as residual connections, layer normalization, and dropout for stable training and improved performance.
- Demonstrated model performance by processing tokenized source and target sequences, showing accurate shape output for sequence-to-sequence tasks.

## Experience

**Parallel and Distributed Computing Lab Manual, Team Leader.**
***Department of Computer Science, IIIT Kottayam*** **(Nov 2024 – Dec 2024)**

- Led a team of 9 members to develop a comprehensive lab manual for the "**Parallel and Distributed Computing**", covering hands-on labs using **OpenMP**, **MPI**, and **multi-threading**, with detailed documentation and implementation of parallel algorithms.
- Worked under the guidance of **Dr. Balasubramanian P, Assistant Professor, IIIT Kottayam**.

## Achievements

- Solved **1000+** problems across platforms like LeetCode, GFG, CodeChef and Codeforces.
- **4-star** CodeChef coder (Max rating:1803).
- Secured **Global Rank 44** in CodeChef Starters 137 Division 3.
- Leetcode rating: 1885 (**Top 4.82%**) Level: **Knight**.
- Completed a **300-day** daily challenge streak on LeetCode, solving **550+** problems.

## Skills

- **Languages:** C++, C, Python, Java, JavaScript, R-Programming, SQL, Assembly (x86)
- **Frameworks and Libraries:** Spring Boot, TensorFlow, Scikit-Learn, Pandas, NumPy, Matplotlib, OpenCV, Hibernate
- **Operating Systems:** Unix/Linux, Windows
- **Distributed Systems:** OpenMP, MPI, Multi-threading
- **Applications:** RESTful APIs, Database Integration, Microservices**,** Classification, Regression, Computer Vision, NLP
- **Data Structures and Algorithms:** Stack**,** Binary Search, Trees, Graphs, Dynamic Programming, Heaps, Segment Trees
- **Competitive Programming:** CodeChef, Codeforces, LeetCode