



## Vignesh Thanigaivel

B.tech Electronics and Communications

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## EDUCATION

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- **Vellore Institute of Technology, Vellore** 2026  
*B.tech Electronics and Communication Engineering with specialization in Biomedical Engineering* CGPA: 8.04
- **Atomic Energy Central School, Anupuram** 2022  
*Central Board of Secondary Education (CBSE) - Computer Science* Percentage: 93.6

## TECHNICAL SKILLS

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**Programming Languages:** Python, Rust, C, SQL, HTML, CSS, Assembly, Verilog, Matlab, R, Java, C++, JavaScript

**Frameworks & Libraries:** AWS, LangChain, LangGraph, ChromaDB, Ollama AI, RAG, NoSQL - MongoDB, Nginx, REST API, Docker, WebRTC, Socket.IO, Django, Discord.py

**Additional Proficiencies:** Data Structures and Algorithms, Server Design and Administration, Load Management, Multi-threading, OOP, Version Control (Git)

**Soft Skills:** Public Speaking, Delegation, Collaboration, Diligence, Result Oriented, Flexible

**Languages:** English, Hindi, Tamil, German

## PERSONAL PROJECTS

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- **Scalable Linked NGINX RTMP-Based Multi-Endpoint Live Video Restreaming System** [Project Link]
  - Engineered a scalable RTMP restreaming pipeline using NGINX and the RTMP module for real-time adaptive live stream replication.
  - Deployed custom CDN cache nodes to distribute video streams efficiently across edge servers, reducing server load.
  - Emphasized low-latency routing, load balancing, and modular configuration for fault-tolerant, infrastructure-grade stream delivery.
  - Tools & technologies used: NGINX, FFmpeg, RTMP, Linux, Shell Scripting
- **Real-Time Proximity Voice Interaction Platform Using WebRTC, Socket.IO, and Phaser** [Project Link]
  - Developed a browser-based spatial voice chat platform using WebRTC for P2P communication, Socket.IO for real-time avatar state sync, and Phaser 3 for 2D movement.
  - Enabled automatic voice connection based on real-time avatar proximity, enhancing user interaction in virtual spaces.
  - Tools & technologies used: Python, JavaScript, WebRTC, Socket.IO, Phaser, HTML5
- **Modular Python Discord Bot with MongoDB Integration and External API Support** [Project Link]
  - Built a scalable, modular Discord bot in Python featuring dynamic user commands, role management, and real-time interactions.
  - Integrated MongoDB for persistent configuration and used external APIs for features like content delivery and live info retrieval.
  - Tools & technologies used: Python MongoDB, REST APIs, Discord.py, Asynchronous Programming
- **Offline AI Summarization & Q/A System (LangGraph + Ollama)** [Project Link]
  - Built a fully offline, context-aware summarization and Q/A system using LangGraph with locally hosted LLMs via Ollama.
  - Designed modular agentic workflows with supervisor coordination, supporting summarization, document-level Q/A, and follow-up conversations using chat-style prompting.
  - Enabled flexible processing of diverse documents with token-efficient chunking, offline retrieval, and dynamic flow control—all without requiring internet access.
  - Tools & technologies used: Python MongoDB, REST APIs, Discord.py, Asynchronous Programming
- For more Projects - [vigneshta.com/projects](https://vigneshta.com/projects) [Link]

WORK EXPERIENCE

- Indira Gandhi Centre for Atomic Research [IGCAR]

Wireless Sensor Networks (Offline Internship)

– Designed and deployed a packet loss testing system using 25 Zigbee modules arranged in a dynamic mesh topology.

– Programmed SAMD20 Cortex-M0+ microcontrollers using Keil IDE and ADCs to analyze communication reliability under varying conditions.

– Applied IEEE 802.15.4 protocols, embedded system design principles, and multi-core architecture experience (8-bit to DSP).
- RC Studios

Server Design & Administration (Hybrid Internship)

– Built a scalable streaming server infrastructure using NGINX and FFmpeg, supporting multi-resolution RTMP output and adaptive HLS playback.

– Implemented load distribution and stream handling strategies to ensure reliable performance under high concurrent traffic.

– Focused on system-level optimization, real-time video routing, and efficient resource management for seamless content delivery.
- Freelance

Server Administrator (Hybrid)

– Planned, deployed, and maintained production-grade servers across hybrid environments, ensuring high availability and fault tolerance.

– Implemented load balancing, traffic shaping, and monitoring solutions to optimize infrastructure under varying workloads.

– Ensured compliance with security standards, validation protocols, and performance benchmarks for robust, scalable deployment.
- Freelance

Web Design (Online)

– Designed and hosted secure, scalable web infrastructures with focus on full-stack reliability and performance.

– Integrated SSL/TLS encryption, custom HTTP server configs, and DNS management for secure domain handling.

CERTIFICATIONS & ACHIEVEMENTS

- RAG and Agentic AI Professional

IBM

View Credential

2025
- Career Essentials in Generative AI

Microsoft

View Credential

2025
- IBM Cloud

IBM

View Credential

2025
- Rust Fundamentals

Duke University

View Credential

2025
- Introduction to Generative AI

Google

View Credential

2024
- Python for Data Science

IIT Madras

View Credential

2023
- Best Paper Award

International Conference on Next Generation Electronics (NEleX)

View

2023
- 250+ Leetcode Daily Coding Challenge Streak

Leetcode

View

2024-2025
- For more Certifications - vigneshta.com/certification [Link]

PUBLICATIONS

- Cloud-Controlled Dynamic Smart Street Lighting System

2023 International Conference on Next Generation Electronics (NEleX)

DOI: 10.1109/NEleX59773.2023.10420861 [Link]
- IoT and Cloud based Automated Irrigation System

2024 3rd International Conference on Artificial Intelligence For Internet of Things (AIIoT)

DOI: 10.1109/AIIoT58432.2024.10574611 [Link]