Vignesh Thanigaivel

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Education

- **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

Programming Languages: Python, Rust, C, SQL, HTML, CSS, Assembly, Verilog, Matlab, R

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

Additional Proficiencies: Data Structures and Algorithms, Server Design and Administration, SSH, Linux, 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

- **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
- **Standalone GUI-Based YouTube Downloader with Multi-Format Support and Encoding** *[Project Link]*
  - Built a standalone Python-based YouTube video downloader with GUI offering multiple formats and encoding options.
  - Implemented the application as packaged and standalone Windows .exe that runs independently without requiring libraries or runtime installations, ensuring portability and ease of distribution.
  - Tools & technologies used: Python, FFmpeg, requests, muti-threading, pillow
- **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 & online 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 [Link]

Work Experience

- **Indira Gandhi Centre for Atomic Research [IGCAR]** *Jun. 2024 - Jul. 2024*
  Wireless Sensor Networks (Offline Internship) Kalpakkam, Tamil Nadu
  - Designed, deployed and analyzed a packet loss testing system using 25 Zigbee modules arranged in a dynamic mesh topology.
  - Programmed SAMD20 Cortex-M0+ microcontrollers using Keil IDE to analyze communication reliability and performance under varying conditions.
  - Applied IEEE 802.15.4 protocols, embedded system design principles, and multi-core architecture experience.

- **RC Studios** *Jul. 2024 - Aug. 2024*
  Server Design & Administration (Hybrid Internship) Coimbatore , Tamil Nadu
  - 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** *Jun. 2023 - Present*
  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** *Mar. 2023*
  Web Design (Online)
  - Designed and hosted secure, scalable web infrastructures with focus on reliability and performance.
  - Integrated SSL/TLS encryption, data caching, custom HTTP server configs, and DNS management for secure domain handling.

Certifications & Achievements

- **AWS Cloud Certified Practitioner** *View Credential*
  AWS Training & Certification 2025
- **RAG and Agentic AI Professional** *View Credential*
  IBM 2025
- **Generative AI Leader** *View Credential*
  Google 2025
- **IBM Cloud** *View Credential*
  IBM 2025
- **Rust Fundamentals** *View Credential*
  Duke University 2025
- **Python for Data Science** *View Credential*
  IIT Madras 2023
- **Best Paper Award** *View*
  International Conference on Next Generation Electronics (NEleX) 2023
- **520+ Leetcode Daily Coding Challenge Streak** *View*
  Leetcode 2024-2025
- For more Certifications - vigneshta.com/certification [Link]

Publications

- **Cloud-Controlled Dynamic Smart Street Lighting System (Best Paper Award)** *16 Feb. 2024*
  2023 International Conference on Next Generation Electronics (NEleX)
  DOI: 10.1109/NEleX59773.2023.10420861 [Link]

- **IoT and Cloud based Automated Irrigation System** *02 Jul. 2024*
  2024 3rd International Conference on Artificial Intelligence For Internet of Things (AIIoT)
  DOI: 10.1109/AIIoT58432.2024.10574611 [Link]