

# MUKILAN T

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## Summary

AI/ML Engineer specializing in **Agentic AI**, **Computer Vision**, and **NLP**. Expert in **LangChain**, **LangGraph**, **LLM orchestration**, and multi-agent systems. Built production AI solutions integrating **vector databases** (**Pinecone**, **Qdrant**), **generative AI APIs**, and **deep learning models**. **Smart India Hackathon finalist (ISRO)**, **Void Hackathon finalist (Top 5)**. Proven expertise in autonomous agent frameworks, prompt engineering, and RAG pipelines.

## Education

### Karpagam Academy of Higher Education

09/2022 – 06/2026 (Expected)

*Bachelor of Engineering in Computer Science*

## Technical Projects

### Void Hackathon: Multi-Agentic Answer Sheet Evaluation | *LangGraph, Gemini API, Computer Vision, OCR* 10/2025

- **Finalist (Top 5)** — Multi-agentic system for automated handwritten answer evaluation
- Orchestrated **LangGraph-based agents** for image processing, OCR, and autonomous scoring without manual intervention
- **Computer Vision pipeline**: YOLOv8 + OpenCV for sheet detection, alignment, segmentation (92% accuracy)
- Integrated **vector database (Qdrant)** for semantic question matching; **Gemini API** for adaptive rubric evaluation
- **OCR agent**: Tesseract + EasyOCR with contextual correction; **Tool-use patterns** for agent coordination

### OLabs Virtual Labs Platform | *Gemini API, Prompt Engineering, NLP, Generative AI*

01/2025 – 03/2025

- **Won OLabs Hackathon** — Automated 3D lab generation using Gemini 2.0Flash
- Integrated **LangChain** for multi-step prompt engineering; autonomous MCQ generation and validation
- **NLP pipeline** for experiment parsing; adaptive assessment via generative AI

### Smart India Hackathon: Air Quality Downscaling | *Deep Learning, CNN, Satellite Data*

2024

- **ISRO Finalist** — Deep learning pipeline for satellite air quality map spatial resolution enhancement
- Built CNN architecture for regression; trained on ISRO satellite datasets

### Indian Railways Inventory Management System | *Electron.js, MongoDB, Node.js*

05/2025 – 07/2025

- Built desktop application deployed to 15+ railway personnel at S&T Podanur
- Automated 35% manual workflows; reduced data errors from 12% to 1.2%
- Implemented dual-backend architecture: local storage for offline functionality plus MongoDB cloud sync

## Entrepreneurship & Innovation

### Founder, Xarlex

2025 – Present

- **XarlexDeck**: AI-powered presentation generator using **Gemini API** and **LangChain** for content creation and slide generation
- **Xarlex Backendry**: AI-based backend code generation platform using **Claude API** with **agentic AI** for autonomous code synthesis
- Integrated **external LLM APIs** (Gemini, Claude, GPT) with **tool-use patterns** for multi-model AI orchestration
- Completed 20+ AI-powered projects with 98% client satisfaction

## Honors & Awards

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### **Void Hackathon — Finalist (Top 5) (2025)**

- Multi-agentic AI system for automated handwritten answer sheet evaluation combining computer vision, OCR, and LLM-based agentic evaluation

### **Smart India Hackathon — ISRO Finalist (2024)**

- Problem **SIH1734**: Downscaling Satellite-based Air Quality Maps using AI/ML
- Built deep learning pipeline with convolutional neural networks for spatial resolution enhancement of satellite data

### **OLabs Hackathon — 1st Place (2025)**

- Developed automated 3D virtual labs platform using generative AI and prompt engineering at national level

### **DELLAITHON India — 3rd Place (2023)**

- Ranked nationally among thousands of participants across India in AI/ML competition

### **ML Quest India — 4th Place (2023)**

- IEEE CIS organized machine learning competition with focus on predictive modeling and data analysis

## Technical Skills

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**AI/ML Frameworks:** LangChain, LangGraph, LangSmith, PyTorch, TensorFlow, Scikit-Learn, Transformers

**Agentic AI & LLM:** Multi-agent orchestration, Tool-use patterns, Prompt engineering, ReACT framework, Autonomous agents

**External LLM APIs:** Deepseek, Gemini API, LLaMA, Ollama, LLM routing and fallbacks

**Computer Vision:** YOLOv8, OpenCV, CNN, Image segmentation, Object detection, OCR (Tesseract, EasyOCR), Transfer learning

**NLP:** Transformers, BERT, GPT fine-tuning, Text classification, Named entity recognition, Semantic search

**Vector Databases & RAG:** Pinecone, Qdrant, Chroma, Weaviate, Vector embeddings, Retrieval-augmented generation

**Languages:** Python, JavaScript, TypeScript

**Databases:** MongoDB, PostgreSQL, Google Cloud BigQuery

**Cloud & DevOps:** Google Cloud Platform, DigitalOcean, Docker, CI/CD pipelines

**Developer Tools:** Git, GitHub, VS Code, Google Colab, Jupyter Notebooks, Postman

## Leadership / Extracurricular

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### **GSSOC'24 Contributor (Remote)**

**2024**

*Top 155 Open Source Contributors*

*GirlScript Summer of Code*

- Ranked globally among thousands of participants; contributed to multiple AI/ML open-source repositories

### **GeeksforGeeks Campus Ambassador**

**2024–2025**

*Technical Event Lead*

*Coimbatore, India*

- Organized 5+ hackathons and technical events with 500+ student participation for promoting coding culture

### **Growbinar Campus Ambassador**

**2025**

*Event Organizer & Mentor*

*Coimbatore, India*

- Conducted full-scale symposium and technical workshop; engaged 600+ students through emerging AI technology sessions