

# Muhammad Abdullah Amin

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## EDUCATION

### Information Technology University of the Punjab

*Bachelor of Science in Computer Science*

Lahore, Pakistan

## EXPERIENCE

### AI/ML Engineer

*Qult Technologies*

Nov 2025 – Present

*Lahore, Pakistan*

- Developed AI-driven **Plunger Lift Optimization System** using machine learning and time-series forecasting to maximize gas production while minimizing equipment damage and methane emissions. Built autonomous AI controller, enabling real-time decision-making and control optimization for oilfield operations.
- Designed and implemented interactive **React/TypeScript dashboards** for real-time performance monitoring, data visualization, and well management. Integrated LLM-powered chatbot with RAG architecture for natural language queries and operational insights.
- Built computer vision solution for **sand extraction automation** using thermal imaging and heat pattern analysis with **Python**, **OpenCV**, and deep learning models. Integrated with robotic control systems for automated sand removal in oil operations.
- Implemented full-stack AI features including document intelligence, semantic search, and conversational interfaces using **LangChain**, **FastAPI**, vector databases, and integration with **OpenAI/Gemini APIs**.

### AI/ML Intern

*Sysmatixx*

Jun 2025 – Aug 2025

*On-site*

- Contributed to the design and implementation of a **Smart Inventory Detection System**, working on the entire machine learning pipeline. Utilized **Roboflow** for dataset preparation and augmentation, **Python** and **TensorFlow** for model training and optimization. Deployed a detection model that enabled intelligent shelves to track inventory levels in real time, trigger automated restocking workflows, and support instant checkout functionality, creating a fully automated smart toy store experience.
- Played a critical role in developing a **Distributed Lead Generation Platform** aimed at streamlining business data acquisition. Contributed to system architecture planning and implemented the frontend using **React**, integrated backend services in **Python**, managed databases through **Supabase**, and automated processes with **n8n**. This scalable platform improved lead collection efficiency and laid the foundation for future business intelligence solutions within the organization.

## PROJECTS

### [COSMOS – Multi-Agent AI Platform](#) | *React, TypeScript, FastAPI, Python, LangChain, Groq LLMs, OpenAI API*

- Built full-stack AI platform with **React + TypeScript** frontend featuring RAG chatbot, YouTube transcript processor, and Gmail agent within a collaborative workspace. Implemented state management with **Zustand** and **React Query** for optimized data fetching.
- Implemented **Retrieval-Augmented Generation (RAG)** architecture with **LangChain** for knowledge-grounded chat using PDFs, URLs, Images, and YouTube content. Integrated **Pinecone vector database** for semantic search and cross-content retrieval.
- Developed Gmail agent with OAuth 2.0, email summarization, classification, and contextual reply generation using LLMs with streaming responses and real-time UI updates.
- Built **FastAPI backend** with SQLAlchemy ORM, implemented RESTful APIs for file uploads, document processing, and AI model orchestration. Designed secure invite-based authentication with JWT, session handling, CSRF protection, and admin panel.

### [Steam Gaming Achievement Tracker](#) | *React.js, TypeScript, Node.js, Express.js, MongoDB, REST APIs*

- Developed full-stack web application with **React + TypeScript** frontend to track and compare Steam achievements across multiple users. Implemented real-time updates using polling, responsive UI with **CSS Grid/Flexbox**, and interactive data visualization.
- Built **RESTful APIs** with **Express.js** and **Node.js** for Steam API integration, achievement retrieval, user profile management, and **MongoDB** data persistence. Implemented caching strategy for optimized performance.

### [AuTisTick – AI Task Management Assistant](#) | *Flutter, Dart, FastAPI, Python, Supabase, OpenAI API*

- Developed cross-platform AI task assistant with **FastAPI backend** and Flutter frontend. Implemented natural language task creation using **OpenAI API** with prompt engineering for task parsing and TickTick API integration.
- Built offline-first architecture with task queue, automatic retry logic, real-time status updates via WebSockets, and **SQLite** persistent storage with state synchronization.
- Designed modern Material Design 3 UI with glassmorphism, Rive animations, responsive layouts, and dark mode. Implemented error boundaries and loading states for optimal UX.
- Integrated **Supabase** for authentication, encrypted token storage, and JWT-based session handling with refresh token rotation for security.

#### GCRTT Automator – AI-Powered Task Automation | *Python, FastAPI, Google APIs, OpenAI API, Groq LLMs*

- Built automation service with **FastAPI** to convert Google Classroom assignments into structured TickTick tasks using **LLM-based parsing**. Integrated **Groq LLMs** and **GPT** for NLP-driven task creation with custom prompt templates.
- Implemented real-time monitoring with Google Classroom API, smart deduplication using content hashing, priority-based scheduling algorithms, and contextual task generation with metadata extraction.
- Deployed on **Render** with cron-based scheduling for 24/7 operation. Built webhook integration for instant task processing and CI/CD pipeline for automated deployments.
- Implemented secure **OAuth 2.0** authentication flow, encrypted token storage, comprehensive error handling with exponential backoff retry logic, and logging/monitoring for production reliability.

## TECHNICAL SKILLS

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**Languages:** TypeScript, JavaScript, Python, Rust, C++, C#, SQL, Dart, Assembly (IPAX88, Arch)

**Frontend:** React, React Query (TanStack Query), TypeScript, Vite, TailwindCSS, Radix UI, Zustand, React Router, React Hook Form, Framer Motion, i18next, shadcn/ui

**Backend & Desktop:** Rust, Tauri, FastAPI, Node.js, SQLite, PostgreSQL, RESTful APIs, GraphQL

**AI/ML:** LangChain, OpenAI API, Gemini API, Groq API, RAG, Vector Databases (Pinecone, Chroma), LLM Fine-tuning, Computer Vision, TensorFlow, PyTorch, OpenCV

**Databases:** SQLite, PostgreSQL, MongoDB, Pinecone, Supabase, Firebase

**Testing & QA:** Vitest, Jest, Playwright, Cypress, React Testing Library, E2E Testing, Accessibility Testing

**DevOps & Tools:** Git, GitHub Actions, CI/CD, Docker, VS Code

**Cloud & Platforms:** Microsoft Azure, Google Cloud Platform, AWS, Heroku, Render, Vercel