



# Ahmed Khan

Fractional CTO | Technical Leader | Applied AI

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## SUMMARY

Head of Applied AI and software engineering leader with **20+ years of hands-on delivery experience** across aerospace, manufacturing, energy, healthcare, real estate, climate tech, and enterprise platforms. Currently building production AI systems as a founder, head of applied AI, and fractional CTO serving multiple startups simultaneously.

**Applied AI Engineering & Leadership.** Architect and ship production agentic AI systems using Claude (Opus 4.6, Code, Agent SDK), GPT-5, Codex, Gemini, LangGraph, LangChain, MCP, and RAG pipelines. Hands-on across the full AI stack — from prompt engineering and evaluation frameworks (DeepEval, OpenAI Evals, LLM-as-Judge) to multi-provider orchestration, guardrails, and production LLMOps.

Former **NASA Mission Control software lead and certified ISS Flight Controller**, recipient of the **NASA Public Achievement Medal**. Background working with **C-level executives, Fortune 500 stakeholders, and startup founders**, translating ambiguous business challenges into concrete technical roadmaps, POCs, MVPs, and production systems. US Citizen. Clearance: Former Top Secret.

## CORE TECHNICAL & FUNCTIONAL SKILLS

**AI Models & Providers:** Claude (Opus 4.6, Sonnet 4.6, Code, Cowork, Agent SDK), GPT-5.3/5.4, Codex, Gemini 3.1 Pro, Google ADK, LLAMA, DeepSeek, Whisper

**Agentic Frameworks:** LangGraph, LangChain, PydanticAI, OpenAI Agents SDK, CrewAI, AutoGen, smolagents, MCP (Model Context Protocol), A2A Protocol, VAPI

**RAG & Knowledge:** RAG Pipelines, Multi-Modal RAG, GraphRAG, Vector DBs (Pinecone, Weaviate, Chroma, Qdrant, pgvector), Hybrid Search, Document Ingestion, Embeddings

**LLM Eval & Governance:** DeepEval, Langfuse, OpenAI Evals, LLM-as-Judge, Hallucination Detection, Guardrails, HITL Patterns, Red Teaming, Responsible AI

**LLMOps & Production:** LLMOps Pipelines, Distributed Tracing, Prompt Optimization, RAG Monitoring, Model Lifecycle Mgmt, Cost Optimization, CI/CD for AI

**Languages:** Python, TypeScript, JavaScript, React, Next.js, Node.js, SQL, Streamlit, C#.NET, Swift

**Cloud & DevOps:** AWS (Bedrock, S3, Lambda, SageMaker), Azure (OpenAI Service, App Service), GCP (Vertex AI), Vercel, Docker, CI/CD, GitHub Actions

**AI Dev Tools:** Claude Code, Claude Cowork, Cursor, Windsurf, GitHub Copilot, Multi-Model Routing

**Architecture:** Enterprise workflows (ERP/CRM/PLM), GraphQL & REST APIs, multi-tenant SaaS, data pipelines, SOC2 | POC → MVP → Scale

**Leadership:** Fractional CTO, Engineering Mgmt, Product Mgmt, Technical Architecture, SaaS/GTM Strategy, AI Enablement, Agile/Scrum

## RECENT AI & TECHNICAL LEADERSHIP

### Technical Cofounder & CTO — Housing Solutions.ai (Pre-Seed Stealth Startup)

2025 – Present | [housingsolutions.ai](http://housingsolutions.ai)

- Architected and implemented an **AI-driven recommendation and market intelligence platform** for senior living as primary technical founder.
- Built **agent-assisted affordability analysis**, care-level matching, and property intelligence workflows using LLMs, RAG pipelines, and vector embeddings.
- Designed and implemented **GraphQL APIs and vector pipelines** unifying housing, health, and financial datasets.
- Implemented LLM evaluation using DeepEval and LLM-as-Judge for response quality and hallucination mitigation.
- Hands-on ownership of LLM workflows, retrieval logic, prompt design, guardrails, and full-stack integration.

**Tech:** Claude, GPT, LangChain, PydanticAI, RAG, Vector Databases, Next.js, TypeScript, Python, GraphQL, MCP

### Head of Applied AI — Ecoheart (Climate/Smart City AI Startup)

Aug 2025 – Present | [ecoheart.ai](http://ecoheart.ai) | Architecture: [eco-arch.vercel.app](http://eco-arch.vercel.app) (pw: eco)

- Designed **complete AI platform architecture** for a pre-seed smart city startup with **active municipal pilot programs** (City of Olympia, WA and others).
- Architected intelligence layer with **10+ AI frameworks** for climate resilience, biodiversity, risk management, and regulatory compliance.
- Designed **closed LLM chatbot with guardrails, lineage tracking, and policy enforcement** for municipal climate decision-making.
- Built **AI MCP Registry** for standardized tool/model connectivity; designed semantic models with ontology and knowledge graph.

- Created **smart city AI agent** with academic literature RAG + web search for urban planning intelligence.

**Tech:** LangGraph, LangChain, Claude, OpenAI, MCP, Big Data ETL, IoT Streaming, Semantic Models, Vercel

## Technical Cofounder & Head of Engineering — Certivo (PSL Studio Company)

Nov 2024 – Apr 2025 | [certivo.com](https://certivo.com) | [GeekWire: 2024](https://www.geekwire.com/2024/certivo/) | [2026](https://www.geekwire.com/2026/certivo/)

- Led hands-on engineering for an **AI-native agentic compliance platform** (CORA) serving regulated manufacturing, launched to **7 enterprise customers** including **Fortive Corporation** (Fortune 500, \$5.4B revenue, 18K+ employees).
- Built production agentic workflows using **LangGraph, LangChain, Pydantic, multi-modal LLMs** (OpenAI, Anthropic Claude, LLAMA).
- Implemented **LLM evaluation pipelines** using DeepEval, OpenAI Evals, and LLM-as-Judge for quality, hallucination detection, and compliance accuracy.
- Designed LLM-first document understanding using RAG and agentic workflows to parse complex regulatory artifacts with audit-ready outputs.
- Built secure, multi-tenant SaaS architecture. Defined technical roadmap and AI strategy from zero to production.

## FRACTIONAL CTO & AI CONSULTING (2023 – PRESENT)

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Advise and build for multiple AI startups simultaneously — from architecture design through production deployment. Projects span legal tech, HR tech, AI search, enterprise RAG, agent orchestration, and multi-modal AI.

- **Legal AI Startup** (2026) — Built live AI-powered real-time transcription and deposition POC. Architecture design, agentic AI development using TypeScript, Claude, and MCP.
- **AI Data Platform Startup** (2026) — End-to-end AI product architecture and development.
- **KuppaAI** — Built Perplexity-style **AI search engine with agentic intelligence**, multi-LLM orchestration (OpenAI + Anthropic).
- **Voice AI Recruiter** — Built real-time **voice-to-LLM recruitment assistant** with Whisper, LLAMA, Anthropic, MCP, and VAPI.
- **Legal Tech RAG** — Designed AI RAG architecture for legal document analysis.
- **Multi-Modal RAG Pipelines** — Built image + text RAG pipelines using Amazon Bedrock Claude 3.

### Consulting Practice:

- Worked directly with founders and executives to identify high-value business problems where GenAI could drive ROI.
- Translated ambiguous requirements into **actionable technical specifications and delivery plans**.
- Delivered AI enablement and training — coaching teams on prompt patterns, evaluation frameworks, agentic workflows, and governance.
- Created reusable assets: playbooks, reference architectures, and demo flows to accelerate future delivery.

## ENTERPRISE & CONSULTING LEADERSHIP

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### Chief Technology Officer / Head of Engineering — Poetic Digital

Jul 2022 – Oct 2023

- Led technology vision for a 40-person digital agency delivering AI, data, web, mobile, and cloud solutions.
- Partnered with sales and leadership to scope opportunities and support go-to-market efforts.
- Introduced modern AI and data platform practices across client engagements.

### Senior Software Manager — Avanade (Microsoft Partner)

Jan 2017 – Jul 2022

- Led large-scale enterprise modernization programs with **20+ person cross-functional teams** (onshore/offshore).
- Defined **technical strategy, architecture, and technology stacks** for multi-year initiatives across retail, healthcare, energy, and transportation.
- Worked directly with **Fortune 100 executive stakeholders**; supported business case development, ROI framing, and executive presentations.

**Highlights:** Fortune 100 retail (2,000+ stores, Azure migration) | Funeral services (1,000+ locations, ~\$90M sales increase) | Oil & gas, healthcare, airline enterprise solutions.

## AEROSPACE & DEEP TECH FOUNDATION

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### Senior Software Engineer & Certified ISS Flight Controller — NASA / United Space Alliance

2006 – 2012

- Served in **NASA Mission Control** supporting real-time ISS operations. Certified NASA Flight Control Officer (2 positions).
- Technical Lead for **ISSLive** and mission planning systems used across Mission Control centers worldwide.
- Designed mission-critical software in safety-critical, high-reliability environments.
- **Recipient: NASA Public Achievement Medal** for technical leadership and innovation.

## Platform Architect → Head of Mobile Delivery — Halliburton Landmark

2013 – 2016

- Promoted from **Platform Architect for Mobile** to **Head of Mobile Delivery**.
- Led team that created the **industry's first mobile geosteering application** (DecisionSpace) for iPad and Android.
- Featured by Xamarin/Microsoft for mobile innovation in energy industry.

## EDUCATION

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**University of Houston – Clear Lake** — B.S. Computer Science

**Stony Brook University** — Mechanical Engineering (Coursework, 3 years)

Graduate Coursework in Technical Management

## AWARDS & RECOGNITION

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- **NASA Public Achievement Gold Medal** — Software Innovation (2012)
- **Johnson Space Center Software of the Year** (2010)
- **Keynote Speaker:** GenAI Adoption, Industrial Immersive (2023)
- Published thought leader — Mobile engagement, telemetry, and AI systems

## PRESS & PUBLICATIONS

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- "[Seattle startup Certivo raises \\$4M to automate supply chain compliance with AI](#)" — GeekWire (2026)
- "[Certivo, a new PSL spinout led by Seattle tech vet, brings AI to compliance management](#)" — GeekWire (2024)
- **NASA Public Achievement Medal** — NASA Tech Briefs Award Winners (2012)
- "[ISSLive! – Bringing the Space Station to Every Generation](#)" — NASA Technical Paper (2011)
- "[Bridging the Tech Gap: How AI Can Transform Industries](#)" — AI Podcast (2023)
- **Oil & Gas Industry First Mobile Platform for Geosteering** — Featured by Xamarin/Microsoft (Halliburton, 2016)
- **Fortune 100 Flagship Sales Application** — Contributed to ~\$90M+ increase in sales