

VATSALYA ARORA

AI / Machine Learning Engineer

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PROFESSIONAL SUMMARY

Engineer with 3+ years shipping production software end to end — from AI models to the cloud infrastructure that serves them. As CTO and co-founder, owned a platform from idea to production on serverless AWS, scaling to 50,000 concurrent users at 99.8% uptime; previously shipped titles for Meta and Universal Studios played worldwide. Builds AI-powered product experiences (LangGraph LLM agents, computer vision, fine-tuned models) and simplifies what exists: halved CI test-suite runtime, cut incident MTTR 40%, compressed inference from 120ms to under 30ms. M.Sc. in AI, Milan.

TECHNICAL SKILLS

Languages: Python, C++ (C++17, low-level systems), TypeScript, JavaScript, SQL, C#, R

AI & Machine Learning: PyTorch, TensorFlow, NumPy, Pandas, Scikit-learn, transformers, CNNs (ResNet), computer vision, fine-tuning, pruning & quantisation

LLM & Agentic AI: LangGraph, multi-agent state machines, LLM tool / function calling, NLP, knowledge graphs (Neo4j), SHAP / LIME / Integrated Gradients for model interpretability

Backend & Cloud: AWS (Lambda, DynamoDB, API Gateway, CloudWatch, S3), serverless and event-driven architecture, REST APIs, Docker, Infrastructure as Code (CDK)

Engineering Practice: End-to-end ownership, performance profiling & optimisation, CI/CD (Jenkins), automated testing, monitoring & alerting, Git, technical leadership

AI, LLM & COMPUTER VISION PROJECTS

- **Autonomous Multi-Agent Event Intelligence System (in progress):** Architecting an event-driven pipeline in which a local PyTorch vision model (ResNet18 backbone) detects real-time events and feeds structured observations into a LangGraph agentic state machine; the LLM agent reasons over incoming events, executes external tool calls, and auto-generates compliance and incident reports.
- **Transformer-Based NLP Model:** Built a transformer model that learns contextual relationships between words from text corpora to produce line-level predictions, achieving 94.6% accuracy.
- **Real vs. AI-Generated Image Detection (Explainable AI):** Designed and trained two shallow CNNs from scratch (2 conv blocks: 82%, 3 conv blocks: 88% accuracy) as baselines, then fine-tuned a ResNet18 to 98% accuracy in PyTorch; applied LIME and Integrated Gradients to surface the exact image regions driving each real-vs-fake decision, plus a full data preprocessing and augmentation pipeline.
- **Financial Risk & Loan Decisioning:** Engineered a gradient-boosted decision pipeline with SHAP explainability for regulatory compliance (98.7% F1-score), and corrected class imbalance via advanced sampling to reduce false-positive credit risk by 15%.

PROFESSIONAL EXPERIENCE

Chief Technology Officer & Co-Founder — Soccer League Company, San Francisco, US

Sep 2024 – Present

- **End-to-End Product Ownership:** Took a sports analytics platform from idea to production: designed serverless AWS infrastructure (Lambda, DynamoDB, API Gateway) for real-time data streaming, scaling to 50,000 concurrent users at 99.8% uptime, and led a team of 3 engineers.
- **Simplification & Delivery:** Cut incident MTTR 40% with CloudWatch alerting and structured metric dashboards, and halved automated test-suite runtime (30 to 15 min per build) by streamlining build validation.

Software Engineer — ImaginX

Nov 2024 – Mar 2025

- **Model Optimization:** Applied pruning and quantization to compress deep learning models, cutting inference latency from 120ms to under 30ms on resource-constrained edge hardware.
- **XR Performance Engineering:** Overhauled shaders and core execution logic in Unreal Engine 5, raising frame rates from 45 to a consistent 60+ FPS on standalone Meta Quest devices (25%+ gain).

Game Developer — GameSim, Keywords Studios

Aug 2022 – Oct 2024

- **Real-Time Systems Optimization:** Refined 3D navigation and NPC Behavior Trees for "Dragon Front Rising" (Meta), sustaining 60 FPS with 80+ active agents on-screen.
- **Automation & Tooling:** Built internal C++ toolsets for Illumination's "Villain-Con Minion Blast" (Universal Studios) and automated release versioning, making 100% of builds traceable and reversible.

EDUCATION

M.Sc., Artificial Intelligence for Science and Technology — University of Milano-Bicocca & Pavia, Italy

Expected 2027

Coursework: Advanced Machine Learning & Deep Learning, Artificial Vision, Image & Signal Processing, Embedded Systems Architecture, Data Management & Decision Support.

B.Sc., Game Development (GPA 3.8/4.0) — Full Sail University, United States

Jul 2022

Coursework: Applied Mathematics, Low-Level Programming, Software Engineering, Graphics Programming.