Matthew Fredrick

Senior AI/ML Software Engineer | Technical Lead

Chelmsford, MA | mattcfred@pm.me | linkedin.com/in/mattcfredrick | github.com/mcfredrick

Key Achievements

- **Technical Leadership Across a 15+ Engineer Org** – Drive technical direction and architecture reviews across multiple teams; own roadmaps for key AI/ML initiatives with near-total autonomy; regularly review designs and provide architectural guidance that shapes how peers build and ship
- **MLOps Platform Architecture** – Architected a comprehensive MLOps platform for AI/ML model lifecycle management using Airflow and MLflow; established organizational standards for continuous training, monitoring, and deployment now adopted across multiple teams
- **Enterprise AI Safety at Scale** – Led the design and delivery of LLM guardrails and safety features protecting millions of users; deployed models spanning content filtering, prompt injection defense, jailbreak prevention, and toxicity detection
- **End-to-End System Ownership** – Drive initiatives from conception to production with full autonomy, including synthetic data pipelines (90% effort reduction), autonomous red-teaming agents, and multilingual safety classifiers across multiple classification domains
- **Mentorship & Talent Development** – Mentor colleagues through formal programs; mentees have advanced to new roles, owned major features end-to-end, and are driving positive change on their teams
- **Cross-Functional Influence** – Partner daily with product, security, linguistics, and platform teams to align technical solutions with business goals; present technical direction and outcomes to senior leadership

Technical Skills

ML/AI: PyTorch, TensorFlow, scikit-learn, Hugging Face Transformers, custom classification models, computer vision, transformer fine-tuning, AI agents, guardrails development, synthetic data generation

ML Operations: Weights & Biases, MLflow, Airflow, GitHub Actions, CI/CD pipelines, A/B testing, model evaluation frameworks

Cloud & Infrastructure: AWS, Azure, Kubernetes, Pulumi, Docker, Infrastructure-as-Code

Programming: Python, C++, Rust

Tools & Platforms: Git, Grafana, Windsurf, Claude Code

AI-Assisted Development: Developing and contributing best practices and reusable workflows for AI coding assistants (Claude Code, Codex) to team knowledgebase, enabling engineers across the org to ship faster while maintaining high code quality through rigorous human review

---

Professional Experience

Senior Software Engineer - AI Platform | Cisco (Collaboration AI/ Webex) | June 2022 – Present

- **Technical Leadership** – Own roadmaps for AI/ML initiatives within a 15+ engineer organization; conduct regular architecture and design reviews; serve as the go-to technical authority for MLOps strategy; led knowledge transfer across teams through internal presentations
- **MLOps Platform** – Drove the architecture of a modular MLOps platform for model lifecycle management; defined organizational standards for continuous training, monitoring, and deployment that became the blueprint adopted across multiple teams
- **AI Security Model Improvements** – Led effort to identify and resolve mis-categorized edge cases in security classifiers, directly improving customer protection; established a data-driven decision-making framework for model performance evaluation
- **Synthetic Data Pipeline** – Drove design and delivery of a modular system that cut data-creation effort by ~90%; extended to support multilingual expansion and multiple classification domains (toxicity, harm detection)
- **Automated Testing Framework** – Drove development of a comprehensive testing framework for AI agent validation including objective generation, notification capabilities, and system tests for full coverage
- **ML-Ops & Continuous Metrics** – Engineered CI/CD pipelines pushing performance data to Weights & Biases for real-time visibility; 49 PRs merged across 15 repositories in 12 months
- **Business-Metric Instrumentation** – Conceived and drove adoption of a lightweight library standardizing metric collection across 8+ microservices; produces per-user cost dashboards in Grafana backed by S3 storage
- **Document Ingestion for RAG** – Architected OCR + parsing pipeline as a hosted service, taking it from POC to production; enables retrieval-augmented generation workflows
- **AI-Enhanced Video Pipelines** – Led development of computer vision pipelines delivering smooth, low-latency video enhancements for millions worldwide; optimized background blur, virtual backgrounds, and relighting for efficient performance on diverse hardware

Software Developer | BandLab Technologies | November 2019 – April 2022

- Owned audio software features from design to delivery for a global music-creation platform, collaborating closely across engineering, product, and design teams
- Built cross-platform applications using C++, JUCE framework, and audio plugin SDKs (VST/AU), ensuring seamless integration and user experience
- Designed, implemented, and debugged systems spanning GUI, DSP, user data persistence, and cloud integration

Software Engineering Consultant | DayJobDevelopment LLC | June 2019 – Present

- Audio and music technology consulting focusing on AI/ML audio manipulation and music information retrieval, C++, JUCE, Python, DSP, and web technologies
- Delivered custom software solutions for clients across diverse technical domains

Inventor Drafting/Automation Specialist | Ipswich Bay Glass | February 2018 – July 2018

- Automated drafting workflows and data handling in Autodesk Inventor using C++ and VBA
- Reduced time to production through custom software solutions integrating with CAD/CAM systems

Design Engineer | SARC Inc | October 2017 – January 2018

- Owned R&D projects from conception to production with strong focus on documentation and version control
- Leveraged prototypes and technical communication to drive stakeholder engagement

Solutions Engineer | Vacuum Technology, Inc. | October 2014 – September 2015

- Delivered customized technical solutions to researchers in private and government laboratories
- Created new documentation standards and provided remote/in-person technical training

---

Education & Certifications

Bachelor of Science, Mechanical Engineering | Worcester Polytechnic Institute | 2013

Certifications:

- Supervised Machine Learning: Regression and Classification (Coursera)
- Advanced Learning Algorithms (Coursera)
- Advanced Audio Plugin Development (Kadenze)
- Responsive Web Design & JavaScript Algorithms (freeCodeCamp)
- Collaborate Effectively for Professional Success (Coursera)