# Jethro Au | AI/ML Engineer

Boston, US

☎ +1 (617) 216-7926  •  ✉ jethrocsa@gmail.com  •  🌐 jethrocsau.github.io

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## Overview

AI/ML Engineer with expertise in multi-modal foundation models, generative protein design (AlphaFold), and explainable systems. Currently a M.S. Health Data Science candidate at Harvard University and Research Intern at Harvard Medical School's AI & Robotics Lab, with a strong track record in training large language models and developing steering algorithms in healthcare and business. Experienced in ML Engineering, algorithm design, and end-to-end pipeline development.

## Core Skills

**ML/AI Frameworks**: PyTorch, TensorFlow, HuggingFace, Transformers, GNNs, Scikit-learn, multimodal agents, foundation model fine-tuning

**Specialized AI**: AlphaFold, Omics-Models, LangChain, RAG, RL (RLHF/RLVR/RLAIF), Explainable AI

**Systems & HPC**: CUDA, MPI, Distributed Training, PySpark, Parallel Computing, High-Performance ML Pipelines

**Programming & Data**: Python, C++, R, SQL, ETL, Data Engineering, Software Development

## Education

**Harvard University**

*M.S. Health Data Science*                                                          2025–2027
**Research Focus:** Multi-Modal Agents, Explainable AI, Causal RL, Omic-aware Language Models
**Key Courses:** ML Computational Optimal Transport, Reinforcement Learning, Causal Inference, Robotics

**Hong Kong University of Science and Technology**

*M.S. Big Data Technology*                                                          2023–2025
**GPA:** 4.0/4.3    **Honors:** TPG Fellowship
**Research Focus:** Guiding algorithms for generative molecular design.
**Key Courses:** LLM, Parallel Programming, Graph Networks, ML Math, CV

**Northwestern University**

*B.S. Industrial Engineering*                                                        2014–2018
McCormick School of Engineering
**Key Courses:** Stats & Machine Learning, Optimization, Stochastic Simulation
**Certificate:** Managerial Analytics (Kellogg School of Management)

## AI/ML Research Experience

**Harvard Medical School**

*Research Intern, AI & Robotics Lab — Multimodal Agent Research*                     2025–Present

○ Designing multimodal agents that integrate clinical, visual, textual, and omics inputs; developing novel architectures for grounded reasoning and contextual understanding.
○ Evaluating agents on factual grounding, modality alignment, and hallucination/error reduction to improve reliability of outputs.
○ Building end-to-end data pipelines for collection, preprocessing, model training, and inference with emphasis on reproducibility and scalability.

**HKUST**

*ML Research — Protein Design (AlphaFold / DeepMind Project)*                                      *2024–2025*

○ Led de novo cyclic peptide design using AlphaFold's protein structure prediction frameworks; improved binding precision for HIV and Hepatitis-C target peptides.
○ Successfully developed candidate peptides by adapting AlphaFold2 to support binding pocket molecular constraints; benchmarked vs RFDiffusion and molecular dynamics simulations.
○ Implemented statistical and structural validation pipelines; produced visualizations and reports for interdisciplinary research teams.

**HKUST**

*AI Research — Language Models*                                      *2023–2025*

○ **XAI:** Developed recursive LLaMA-7B framework reducing hallucinations by 8% on TriviaQA.
○ **Grounding:** Implemented prefix-based sensitivity tuning for improved factual grounding.
○ **Graph Networks:** Created cross-domain graph using an MoE-inspired architecture for task generalization.
○ **Multimodality:** Built image-to-audio generation models using LoRA adapters.

## Industry Experience

**Apricot AI**

*AI/ML Engineer*                                      *2025*

○ Fine-tuned clinical LLMs using distillation and GRPO preference alignment.
○ Implemented curriculum learning and direct-RLAIF for improved reasoning.
○ Developed safety-aware autoprompt optimization agents.

**Freelance**

*LLM Agent Course Developer*                                      *2025*

○ Developed an LLM agent course using Flowise (Langchain).
○ Course covered: advanced prompting techniques (few-shot, CoT, CoVe), agentic workflows, RAG, MCP, and multi-modality.

**C-POLAR Asia**

*R&D Coordinator*                                      *2023–2025*

○ Developed ML systems for real-time pathogen detection and risk assessment.
○ Researched digital-twin approaches to combat antibiotic-resistant organisms.

**Prenetics**

*Project Lead*                                      *2021–2023*

○ Led ETL + ML pipelines for 2M+ COVID tests, reducing errors by 30%.
○ Scaled digital interfaces to support 400+ staff daily throughput.

## Selected ML Projects

*High-Performance Computing*                                      *2024*

○ **Parallel DNA Analysis:** Accelerated k-mer mining algorithms using CUDA/MPI/Pthread algorithms.
○ **Distributed ML:** Built a scalable PySpark Random Forest algorithm with dynamic partitioning.
○ **Medical ML:** Compared ML algorithms with Grid & Bayesian search, evaluating SMOTE vs. cGAN imbalance correction.

## Selected Publications & Recognition

**Research**: TPG Fellowship in Big Data Technology

**Innovation**: ACS Hackathon Winner — Haptic Feedback System

**Publication**: Co-author, "Financial Considerations in Primary Healthcare after COVID-19," Springer Nature

**Leadership**: Northwestern Blockchain Group Co-Founder, Charity Exhibition Director