

Ethan Aidam

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EDUCATION

Harvard University

Cambridge, MA

BA in Biomedical Engineering. Secondary in Computer Science.

May 2027

Athletics: NCAA Division I Varsity Track & Cross Country (20+ hrs/week),

Coursework: Advanced Practical Data Science, Statistical Inference, Bioinformatics and Statistical Genetics, Biological Signal Processing, Quantitative Physiology, Organic Chemistry, Using Big Data to Solve Economic & Social Problems.

EXPERIENCE

Harvard University (Shakhnovich Lab)

Cambridge, MA

Machine Learning Research Assistant

June 2026 – Present

- Fine-tuned PPLM-Affinity, a pretrained **protein language model**, using **PyTorch** to predict SARS-CoV-2 protein binding affinities, improving sequence-based modeling for biophysical fitness landscape analysis.
- Built a **GPU-based training pipeline** using **SLURM** and **CUDA** to speed up protein language model experiments, caching model outputs to avoid repeated computation and using 5-fold cross-validation to evaluate performance.

Hiroshima University (School of Medicine)

Hiroshima, Japan

Epidemiological Research Assistant

June 2025 – Aug 2025

- Conducted survival analysis in **R** on 400,000+ electronic health records from a Japanese national health insurance dataset, using **Cox proportional hazards models** to identify socioeconomic predictors of obesity onset.
- Identified an at-risk population for obesity onset, with low-income participants in economically deprived neighborhoods showing the highest risk (HR 1.14), consistent across sensitivity analyses adjusting for BMI and behavioral covariates.

Harvard Data Science Initiative

Boston, MA

NSAPH Project Management Intern

May 2024 – Present

- Led implementation of a Basecamp-based project management system for a national consortium of 100+ climate and health researchers, improving efficiency of project tracking, data usage documentation, and grant acknowledgment processes.
- Redesigned and maintain the consortium's public-facing website, managing deployment, and ongoing content updates.

University of Maryland, Baltimore County (Lobo Lab)

Baltimore, MD

Molecular Biology Research Assistant

June 2024 – Aug 2024

- Investigated genes regulating stem-cell-driven regeneration in planarian worms using **RNAi**-mediated gene knockdown workflow, including **PCR** amplification, **gel electrophoresis** validation, **dsRNA** synthesis, and purification.
- Collected and analyzed quantitative phenotypic data across 200+ planarians, measuring fluorescence, pigmentation, and reproductive outcomes to evaluate gene knockdown efficacy and gene-function relationships.

PROJECTS

Last Mile Health KPI Agent | Python, LangGraph, LangChain, AWS, PostgreSQL

Mar 2026 – Present

- Built a LangGraph-based multi-agent text-to-SQL system enabling Last Mile Health staff to query an AWS data warehouse of Key Performance Indicators (e.g., community health worker training metrics) using natural language.
- Reduced response latency from 1-2 minutes to seconds, by implementing schema-aware retrieval, deterministic retry logic, and PostgreSQL query caching.

Hypothermia Gene Set Enrichment Analysis | R, Bash, DESeq2, edgeR, STAR, Bioconductor

May 2026

- Implemented Gene Set Enrichment Analysis (GSEA) from scratch in R, reproducing enrichment scores and statistical tests including permutation testing, empirical p-values, and false discovery rate correction, validated against GSEA Software.
- Developed an end-to-end RNA-seq pipeline using STAR, DESeq2, and edgeR on a human gene expression dataset, identifying enrichment of heat shock and proteostasis gene pathways following hyperthermia.

Blood Lactate Estimation | Python, Scikit-Learn, PyMC

Dec 2025

- Developed ensemble machine learning models (Random Forest, Gradient Boosting, Mixture of Experts) to predict blood lactate from non-invasive wearable physiological signals, improving test set R^2 to 0.92.
- Built a PyMC Bayesian hierarchical model with day-varying intercepts and oxygen-saturation slopes to quantify uncertainty and capture variation across repeated exercise sessions.

LEADERSHIP

Harvard Tech and Global Health Initiative

Cambridge, MA

Executive Director

Aug 2023 - Present

- Lead a 50+ member organization delivering technology-driven consulting and research projects for global health partners.
- Launched charity 5k fundraising initiative which has raised \$10,000+ for cancer research and care organizations.

TECHNICAL SKILLS

Languages: Python (NumPy, Pandas, Matplotlib, Scikit-Learn, PyTorch), R (ggplot2, survival, Bioconductor), SQL, Bash

AI & Machine Learning: Linear/Logistic Regression, Survival Analysis, Ensemble Learning, Deep Learning, Transformers, Protein Language Models, Cross-Validation

Bioinformatics: RNA-seq, GSEA, DESeq2, edgeR, STAR, Bioconductor, RNAi, quantitative phenotyping

Tools & Infrastructure: Git, SLURM, AWS, GCP, Docker, PostgreSQL, LangGraph, LangChain, FastAPI, Power BI