

Pedram Bayat

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Education

University of Pennsylvania, School of Engineering and Applied Science Philadelphia, PA
Candidate for M.S. in Systems Engineering, B.S. in Bioengineering, & Minor in Data Science May 2027

- **Widjaja Entrepreneurship Fellow:** One of 12 engineering students selected for 1-year work-study program to develop entrepreneurial skills in analyzing, creating, and leading highly technical ventures.
- **Selected Coursework:** Machine Learning, Statistics for Data Science, Convex Optimization, Learning in Robotics, Big Data Analytics, Discrete Mathematics, Signals & Systems, Human Physiology, Organic Chemistry.

Professional Experience

Perelman School of Medicine at the University of Pennsylvania March 2024 – Present
Research Assistant, Goodman Lab & Ruella Lab Philadelphia, PA

- Develop end-to-end pipeline for de novo CAR binder design using AF-Multimer, ESM2, and ProteinMPNN.
- Co-authored manuscript published at *Science Translational Medicine*, and abstracts at ICLR 2025 and ASH 2025.
- Mentor visiting researchers by providing guidance on experimental design, data analysis, and project development.

Chloropept September 2024 – Present
Co-Founder & Lead Engineer Philadelphia, PA

- Lead machine learning engineering for de novo design and validation of antimicrobial compounds.
- Drive customer discovery and market analysis to inform product strategy and validate product-market fit.
- Co-lead fundraising efforts, securing \$30k+ in grants and non-dilutive capital funding.

Genentech June – August 2025
Biochemical and Cellular Pharmacology Intern South San Francisco, CA

- Developed and optimized functional and binding assays to evaluate CAR-T therapeutic candidates.
- Analyzed dose-response and luminescence datasets to guide pharmacological decision-making.
- Presented findings to BCP leadership and at a company-wide poster session.

Arc Institute May – September 2024
Research Intern, Goodarzi Lab Palo Alto, CA

- Analyzed scRNA-seq data to characterize transcriptional responses of cancer cells under hypoxic conditions.
- Implemented graph-based dimensionality reduction, clustering, and pathway enrichment analysis.

Technical Projects

Multimodal Deep Learning for Antimicrobial Peptide Screening | *PyTorch, AlphaFold* November 2025

- Developed a dual-arm neural network using a Bi-GRU and two-stage attention mechanism to predict MIC.
- Integrated AlphaFold structural features to improve OOD generalization.

Real Time Facial Expression Recognition | *Python, Torchvision, OpenCV* November 2025

- Developed real-time CV pipeline using ResNet18 to detect and classify facial expressions from live webcam feeds.
- Designed robust preprocessing workflow including bounding box and PIL-to-tensor transformations.

Single Cell Assist | *Python, AutoGen, Agentic AI* January 2025

- Developed agentic LLM pipeline to automate cell type prediction in single-cell RNA sequencing analysis.
- Awarded 1st prize at 2025 Immune Health Hackathon and contributed to workshop paper at ICLR MLGenX 2025.

Leadership Experience

Teaching Assistant, Big Data Analytics August 2025 - Present
Department of Computer and Information Science, University of Pennsylvania Philadelphia, PA

- Support a 300-student graduate-level course covering machine learning, distributed computing, and data analytics.
- Curate homework assignments, write lecture materials, host weekly office hours, and evaluate exams and projects.

Technical Skills

Programming Languages: Python, R, SQL, C++ (Arduino), MATLAB.

Machine Learning: PyTorch, scikit-learn, NumPy, Pandas, Matplotlib, SciPy.

Bioinformatics: Scanpy, DESeq2, Seurat, FlowJo, PyMol, ChimeraX, GSEA.

Developer Tools: AWS (EC2, S3), Hugging Face, Git/GitHub.

Laboratory: Functional Assays, Viral Vector Production, Flow Cytometry, PCR, Protein Purification, Cell Culture.