Pedram B. Bayat

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EDUCATION

University of Pennsylvania, School of Engineering and Applied Science — **Philadelphia, PA**
Candidate for B.S.E. in Bioengineering, Intended M.S.E. in Systems Engineering — May 2027
Relevant Coursework: Machine Learning, Big Data Analytics, Probability, Discrete Mathematics, Linear Algebra, Differential Equations, Programming (Java), Signal Processing, Physiology, Biomaterials, Biomechanics, Organic Chemistry

PROFESSIONAL EXPERIENCE

Genentech — **South San Francisco, CA**
Intern, Biochemical and Cellular Pharmacology — June 2025 – Present

- Optimize functional and binding assays for cell-based therapies.

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

- Develop CAR-T cell therapies against relapsed/refractory B cell lymphoma to reduce long-term immunosuppression.

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

- Analyzed single-cell RNA sequencing data to investigate the impact of hypoxia environments on cancer cells.
- Implemented graph-based dimensionality reduction (UMAP), PCA, and pathway enrichment analysis (e.g. GSEA, ORA).
- Revealed unique properties of hypoxia cancer cells compared to normoxia, refining future research process for the project.

Stanford University School of Medicine — **Stanford, CA**
Student Researcher, Kornberg Lab — June – August 2023

- Purified eukaryotic topoisomerase IIα to discover structure of C-terminus and investigate small molecule binding.
- Delivered presentation summarizing small molecule discovery and use of the protein as an inhibitor of cancer growth.

PROJECTS

Spotify Genre Classification — **PyTorch, scikit-learn, Pandas, NumPy**

- Developed a multi-class classification model to predict genres of Spotify songs based on their audio features.
- Worked on EDA, feature engineering, and implemented Random Forest, XGBoost, and neural network models.

Single Cell Assist — **Microsoft AutoGen, Agentic AI**

- Agentic large language model 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 MLGenX2025

Cell Movement and Morphology Analysis — **OpenCV, SciPy, Pandas, NumPy**

- Developed an automated pipeline to draw contours, measure cell velocity, change in cell area, and brightness intensity.

SKILLS

Programming: Python, Java, R, MATLAB, OCaml, C++(Arduino), HTML
Frameworks: PyTorch, scikit-learn, XGBoost, Scanpy, DESeq2, AnnData, OpenCV, Microsoft AutoGen
Data Science: Pandas, NumPy, Matplotlib, Seaborn, Plotly, SciPy
Software: CAD; UCSF ChimeraX; Epic EHR; REDCap; GraphPad Prism; ImageJ; FlowJo; Microsoft Suite.
Laboratory: Functional Assays; Viral Vector Production; Flow Cytometry; PCR; Blotting; Protein Purification; Cell Culture.

LEADERSHIP & TEACHING

Science Olympiad at the University of Pennsylvania — **Philadelphia, PA**
Director, Nature of Science Events — September 2023 – Present

- Lead organization of annual competition, supporting and guiding the preparation of exams.

University of Pennsylvania — **Philadelphia, PA**
CIS 5450 (Big Data Analytics) Teaching Assistant — August 2025 – Present

- Curate/grade homework assignments, host office hours, and assist in final project (ML) for ~200 student course.

PHYS 0151 (Electricity & Magnetism) Teaching Assistant — August – December 2024

- Supervise weekly student physics laboratory (PHYS 0151) work to facilitate greater understanding of physical concepts.