Pranav Mahableshwarkar

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Education

Brown University Providence, RI

BS in Computer Science (Machine Learning/Comp. Bio focuses), BA in Applied Math; GPA: 4.0 *2021 - 2025*

Languages: Python, C/C++, Linux, SLURM, CUDA, Docker, SQL/NoSQL, Go, R, Java, Functional Programming

Frameworks/Libraries: PyTorch, TensorFlow/Keras, Pandas, Git, Numpy, Matplotlib, Statistical Programming in R

Experience

insitro May 2024 - Aug 2024

Software Engineering Intern *South San Francisco, CA*

- Developed an internally enhanced literature-review RAG chatbot, indexing 36 million papers on PubMed.
- Utilized AWS and python software packages to support machine learning research at insitro.

National Institutes of Health May 2023 - Aug 2023

Deep Learning and Software Engineering Research Intern *Bethesda, MD*

- Developed computational models and deep learning methods for the analysis of gene regulatory elements.
- Unit-tested/packaged the model code-base for broader use at the NCBI, preparing the project for publication.

Singh Lab and Larschan Lab at Brown University Apr 2022 – Present

Deep Learning and Computational Biology Researcher *Providence, RI*

- Computational and wet lab work contributed to and featured in 3 lab publications and conference presentations.
- Developing a multi-modal contrastive learning model capable of handling complex healthcare datasets and investigating mechanistic interpretability methods for DL models.

Brown University Jun 2022 – Present

Head Teaching Assistant for Deep Learning (S24) *Providence, RI*

- Leading a team of 33 TAs to develop and run CS1470 for 350+ undergraduate/graduate students.
- Taught concepts including generative models, natural language processing, graph/image models, and more.

Undergraduate Teaching Assistant in the Computer Science and Biology Departments

- F2023/24: Computational Mol. Biology, S2023: Fundamentals of Computer Systems, F2022: Genetics
- Developed new projects involving Markov Models, bioinformatics, and distributed server/kernel implementation.
- Graded student work, held office hours and led weekly recitation/review sessions for classes with 200+ students.

Projects and Publications

DNABERT-Enhancer | *Pytorch, CUDA, SLURM, Perl* | **Submitting Publication** May 2023 - Oct 2023

- Project developed/presented at the National Institutes of Health/National Center for Biotechnology Information.
- Interpetable Transformer model for highly accurate classification of enhancer regions in the human genome.
- Training strategies included multi-GPU distributed data processing & Low Rank Adaptation for Language Models.

BindCompare | *Python, R, Bash/Shell, tkinter* | **Publication Under Review** Oct 2022 - Present

- Developed a *tkinter* app to identify locations where gene regulation and RNA processing are coupled.
- Easy to use interface allows users to upload data and visualize results/downstream motif and ontology analysis.
- Multi-threaded back-end applies interval trees to rapidly select/analyze candidate co-regulators.

eLife Publication | *Sex-specific splicing occurs genome-wide during early Drosophila embryogenesis* Jun - Dec 2022

- Developed Linux HPC pipelines for RNA-seq analysis for analyzing sex-specific splicing differences in *Drosophila*.

BindGPS | *Pytorch, Jupyter Notebook, SLURM* Sep 2023 - Present

- Multi-modal model that focused on sequence (RNA-seq/ATAC-seq) and epigenomics (Hi-C, ChIP-seq, etc.).
- Trained a graph convolutional network from 3D Micro-C and Hi-C data to predict sex-specific protein binding.
- Utilized GNNExplainer and Gradient-Based methods to reveal mechanisms of protein localization.

Bumble Base | *Golang, SQL, Python* Sep 2023 - Dec 2023

Awards, Interests, and Coursework

Awards: Eagle Scout ('21), President's Silver Volunteer Award ('20), Undergraduate Teaching & Research Award ('22)

Coursework: Deep Learning in Genomics (**Graduate Class**), Computational Molecular Biology, Machine Learning, Deep Learning, Genetics, Database Management Systems, Computational Probability and Statistics, Graphs and Networks, Fundamentals of Computer Systems, Theory of Computation, Chemistry I

Activites: Co-Captain of Brown Club Swim, Coordinator for Brown Science Prep