

Mukta Ubale

PASSIONATE ABOUT SCIENCE, TECHNOLOGY, & SOCIETY

/ ALL ABOUT ME

Early career biological data scientist, supported by strong multidisciplinary academic foundations and collaborative experiences in various computational biology teams. Eager to leverage data-driven technology to advance drug discovery, disease prediction, and precision health. Seeking positions that provide hands-on experience innovating and integrating novel and data-intensive software programming tools in order to accelerate biomedical scientific discovery.

[my website!](#)

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1 (408) 769-1589

/ EDUCATION HISTORY

Harvey Mudd College - Class of 2024

Joint Major of Math, Computer Science, and Biology

- President of 5C Women in Computing Machinery Club ([ACM-W](#))

/ SKILLS

Artificial Intelligence & Data Science

TensorFlow MLPs PyTorch Pandas Excel CNNs
SQL Conda/Mamba Colab Jupyter MATLAB Rest API

Software Engineering & Development

R & R-Studio Python Linux C/C++ GitHub & Version Control
OpenCV HTML/CSS Git XCode Swift Docker Java

Biotechnology & Bioinformatics

BASH (Unix) R-Statistics FASTA NumPy & Sci-Py BLAST GSEA

Relevant Coursework: Neural Networks, Data Structures & Program Development, Computer Systems, Programming for Science & Engineering, Computation in Microbiology, Data Science I, Biostatistics, Advanced Computational Biology, Molecular Genetics, Abstract Algebra

/ WORK EXPERIENCE

> Software Engineer & Deep-Learning Researcher Lawrence Livermore National Labs | August 2023 to Present

- Studying empirical scaling laws of scientific machine-learned models to test and verify hypothesis that neural networks display an overall model error performance that obeys a power-law relationship to dataset size and total number of model parameters ([relevant research](#))
 - Developing open-source software tool to output model-specific convergence curves and determine optimal simulation data, computational power requirements, and model parameters needed to produce a deep neural network with a degree of precision and accuracy for an arbitrary scientific machine learning project

> Software Engineering Intern CelectGen | May 2023 to August 2023

- Developed a mobile Application using Flutter and Dart programming in order to integrate the quantifiable measures of tissue destruction biomarkers provided from CelectGen's saliva-based test technology into an analytics platform that visualizes a patient's longitudinal clinical and disease activity data; main features implemented include:
 - Firebase API development to securely manage and connect clinician and patient data, allowing for a stronger real-time database
 - Object detection using Google ML kit and TensorFlow to automatically and precisely capture pixel densities correlating from test strips
 - Real-time image processing (using Dart's Image package) of scans to calculate concentration of MMP-8 enzyme and determine levels of active disease/tissue destruction

> Machine Learning Research Assistant Harvey Mudd College [Bee Lab](#) | August 2022 to June 2023

- Explored new methods for estimating flower density on images of plants extracted from UAV dataset
- Researched pre-existing deep learning architectures used for Object Counting and Density Mapping to shortlist potential models based on specific features of raw dataset and ground-truth annotations
- Implemented a Faster R-CNN object detection model to determine the density of flowers of plants, increasing accuracy by 20%
- Developed segmentation models using SegNet to compare algorithms by performance metrics and establish optimal model

> Junior Data Scientist Cytokinetics | July 2022 to November 2022

- Worked 1-on-1 with RNA-seq team to develop an gene expression data analysis application using Jupyter Notebook
- Independently researched asymptotic behaviors of Next-Generation-Sequencing software algorithms in order to determine most effective data structures to reduce costs and computational and storage requirements

> App Developer and Project Manager Lotus Integrative Health & Nursing | April 2021 to August 2021

- Effectively collaborated with international professional dev team for currently expanding biotech and functional healthcare start-up
 - Worked directly with fertility/women's health companies to conduct research to enhance data collection and user experience
 - Developed and presented prototype app to assist women with their gynecologic health using Swift and XCode
 - Communicated with CEO and CTO to develop business plan and offer feedback to international software development team

/ OTHER WORK & PROJECTS

> AI-Based AT1R Docking Research Intern

Western College of Health Sciences | April 2023 to Sept 2023

- Generated mutated human & opossum Angiotensin II receptor protein using AlphaFold and examined their docking capabilities with various ARBs using AutoDockFR and NAMD and VMD for visualization

> Data Structures/Program Development Tutor & Grader

Harvey Mudd College | August 2021 to May 2023

- Tutored students 1-on-1 on how to use Docker and C++ to maximize time, memory space and bandwidth efficiency of different software and machine learning algorithms

> Clinical DNA Sequencing Lab Assistant

Harvey Mudd College | September 2021 to April 2022

- Assisted upperclassmen in BioMakerspace with to prepare specific plasmids and perform biochemical reactions using Opentrons machinery and E. Coli K12 genome

> Laboratory Assistant

The Tech Interactive | June 2018 to March 2020

- In charge of preparing agar plates, maintaining a clean environment, storing E. coli and DNA, developing strong lab safety and sterility skills; and built strong scientific communication skills while using the Anatomage Table to teach virtual dissection labs