Mukta Ubale

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2024 CS/Math/Bio Graduate,
seeking a full-time role in Bioinformatics and Software Engineering starting May 2024

EDUCATION

Harvey Mudd College **Claremont, CA**
Bachelor of Science: Joint Major Computer Science, Math and Biology 2024
- GPA: 3.65/4.00
- Coursework: Neural Networks, Data Science I, Data Structures, Computer Systems, Programming for Science & Engineering, Abstract Algebra, Biostatistics, Advanced Computational Biology
- Tutor & Grading Assistant for Data Structures & Program Development, Abstract Algebra, and Biostatistics

Cupertino High School **Cupertino, CA**
High School Diploma 2020
- GPA: 3.93/4.00

TECHNICAL SKILLS

Programming Languages: Python, JAVA, C, C++, HTML/CSS, R & R-Studio
Artificial Intelligence and Data Science: PyTorch, TensorFlow, MATLAB, OpenCV, CNNs, MLPs, Pandas, Excel, Rest API, Conda/Mamba, Colab, Jupyter, NumPy, Sci-Py
Developer Tools: VSCode, Git, GitHub, Docker, XCode, Swift, BASH (Unix), Linux **BioInformatics:** SQL, R-Statistics, FASTA, BLAST, GSEA, Tableau, Excel

EXPERIENCE

Software Engineer & Deep Learning Researcher 08/2023-Present
Lawrence Livermore National Labs, Berkeley, CA
- Working directly with Senior Engineer Robert Blake in order to research and test effects of scaling 0-dimensional scientific datasets and various transformer architecture model parameters (i.e. heads, number of hidden layers, etc.) to examine the predictability of scaling generative AI models
- Gain firsthand experience working with high-performance computing through the Livermore Compute platforms and utilizing NVIDIA® GeForce RTX™ 4090 GPU for local model runs
- Developed software tool with user config to specify datasets and NN architecture family specification that auto-distributes the workload over HPC systems and runs simulations to sweep over the range and produce accuracy isocontour graphs.
  - Currently packaging and publishing open-source software tool and workflow to help LLNL scientists gain deeper understanding of the relation between size of the training data, scale of computations (number of model parameters) and modeling accuracy for massive scale scientific computing problems.

Software Engineer (Intern) 05/2023-8/2023
CellectGen Inc., Pasadena, CA
- Developed analytics platform and mobile application for CellectGen's saliva-based test technology that accurately measures tissue destruction biomarkers. The application provides visualization of a patient's longitudinal clinical and disease progression data.
- Implemented Firebase API development to securely manage and connect clinician and patient data to and from a real-time database.
- Implemented object detection DNN algorithm using GoogleML and TensorFlow to automatically and accurately capture pixel densities from test strips scans.

- Real-time image processing (using Dart) of scans to calculate concentration of MMP-8 enzyme and determine levels of tissue destruction.

Research Assistant 08/2022-6/2023

Harvey Mudd College Bee Lab., Claremont, CA

- Implemented new methods of exploring flower density from Unmanned Aerial Vehicle (UAV) captured images to monitor California Buckwheat growth at the Claremont Botanical Garden
- Literature survey of prior methods of deep learning architectures used for object counting/density mapping and shortlisted potential model architectures best suited for the dataset images and annotations.
- Implemented image pre-processing, augmentations, Faster R-CNN object detection and SegNet segmentation models. Performed training and hyper-parameter tuning to improve accuracy by 20%.

Junior Data Scientist 07/2022-11/2022

Cytokinetics, South San Francisco, CA

- Worked 1-on-1 with RNA-seq team to develop gene expression data analysis application using Jupyter Notebook and Illumina sequencing platforms.
- Researched asymptotic behaviors of Next-Generation-Sequencing (NGS) algorithms to determine most costefficient data structures by reducing compute and storage requirements.

App Developer & Project Manager 04/2021-07/2021

Lotus Integrative Health & Nursing, Campbell, CA

- Collaborated with international software development team and developed a product prototype for a biotech startup focused on women's gynecological health and fertility.
- Worked directly with fertility/women's health companies to enhance data collection and user interface.
- Developed application using Swift and XCode and gave presentation to CEO and CFO

OTHER WORK & PROJECTS

AI-Based AT1R Docking Research Intern 04/2023-09/2023

Western College of Health Sciences, Pomona, CA

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

Clinical DNA Sequencing Lab Assistant 09/2021-04/2022

Harvey Mudd College, Claremont, CA

- Assisted upperclassmen in BioMakerSpace in preparing specific plasmids and conducting biochemical reactions using Opentrons machinery and E.Coli K12 genome.

Laboratory Assistant 06/2018-03/2020

The Tech Interactive, San Jose, CA

- In charge of preparing agar plates, maintaining clean environment, storing E.Coli and DNA, maintaining strong lab safety and sterility standards and teaching virtual dissection labs using the Anatomage Table. 200+ hours.

COMMUNITY & LEADERSHIP

- President of 5C Women in Computing Machinery Club (ACM-W)
    - Managing and organizing events for over 150 members across Claremont Consortium
    - Advocated for female, underrepresented voices in CS and computational sciences through partnerships with Gen She, AnitaB.Org, and CMD-IT
- Teaching Fellow, Breakthrough Silicon Valley
    - Elevating first-generation communities from South Bay through education.