Kimaya Kulkarni

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Education

UCLA: MS, Electrical & Computer Engineering, GPA: 3.96/4.00 — Sep 2021 — Dec 2023
VIT PUNE: BTech, Electronics and Telecommunication Engineering, GPA: 9.21/10.00 — Aug 2016 — Oct 2020

Skills

Programming	Python, C/C++, Matlab, SQL, R
Frameworks	PyTorch, TensorFlow, Keras, Scikit-learn, OpenCV, Pandas, SciPy, Flask, Dash
Tools & Platforms	Docker, AWS, Git, Linux, Jupyter, Bash

Experience

UCLA HEALTH : Research Data Scientist — Jun 2024 — Present

- Developed a medical imaging AI solution with three core modules (Data Characterization, Harmonization, Robustness Analysis) using Flask, Dash, and PyTorch. The toolkit's live demo earned 2nd place at SPIE Medical Imaging Conference.
- Resolved memory bottlenecks in lung imaging workflows by redesigning the system with Docker, making it faster, more efficient, and easier to run advanced algorithms.
- Cleaned and merged complex breast cancer diagnosis data from multiple tables using SQL and physician input, creating a standardized dataset that made AI research easier and more reliable across institutions.
- Led a federated learning pilot using NVIDIA FLARE on open-source image data, enabling secure, privacy-preserving AI training across multiple sites and laying the groundwork for future medical data use.

VISUAL MACHINES GROUP, UCLA : Grad Student Researcher — May 2020 — Dec 2023

- Developed a contactless vital signs measurement system that combines camera and radar data using advanced AI techniques, achieving a 37% improvement in heart rate estimation accuracy over previous methods and significantly reducing bias across skin tones, making the technology more equitable for diverse populations.
- Built and open-sourced large, demographically diverse datasets, designed deep learning models and loss functions robust to imperfect, misaligned data, resulting in more reliable AI training and fairer performance in real-world healthcare scenarios.

RIVIAN AUTOMOTIVE : Software Engineering Intern — Jun 2022 — Sep 2022

- Refined object detection algorithms by adjusting image quality parameters in the image signal processor, achieving a 30% reduction in false positives and 5.8% increase in true positives, significantly boosting algorithm accuracy and reliability.
- Streamlined the data processing pipeline for object detection, enhancing operational efficiency by automating data collection, ISP parameter adjustments, and image processing, which expedited results delivery and improved model throughput.

Key Projects

Toolkit To Characterize and Normalize Variability in Medical Imaging Data — Jun 2024 — Present

- Built an automated data characterization module that analyzes large datasets for variability at both the pixel/voxel level and metadata level, delivering clear, actionable quality insights.
- Developed a flexible normalization library featuring imaging-based, Transformer, CNN, and GAN methods, allowing users to select the most effective AI-driven approach.
- Created a model sensitivity analysis tool that tests any deployed AI model across diverse imaging conditions, generating variability reports to guide performance tuning and ensure robust, reliable results.

Equitable Heart Rate Estimation Using Sensor and Face Video Data Jun 2020 - Dec 2023

- Developed a heart rate estimation method for face videos that uses signal-to-noise ratio (SNR) weighting, significantly boosting accuracy by 31% for dark skin tones, 22% for medium, and 18% for light skin tones compared to prior methods, and reducing bias across diverse populations.
- Introduced radar sensing and fused it with camera data using deep learning, improving detection accuracy by 37% and making remote vital sign monitoring fairer and more reliable for people with darker skin tones.

Publications

SPIE MEDICAL IMAGING 2025 CT-Norm: a toolkit to characterize and harmonize variability in CT
SIGGRAPH 2022 Blending Camera and 77 GHz Radar Sensing for Equitable, Robust Plethysmography
ICCP 2022 Blending camera and 77 GHz radar sensing for equitable, robust plethysmography
ARXIV Diverse RPPG: Camera-based Heart Rate Estimation for Diverse Subject Skin Tones and Scenes