AMRUTA PAI

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HIGHLIGHT

- 8+ years of research experience working with diverse physiological and behavioral health data
- Track record of research, publications, and patented innovation in Health AI
- Proven focus on fairness, interpretability, and real-world impact in health tech

TECHNICAL EXPERTISE

- **Technical skills**: Deep learning, causal inference, statistical machine learning, signal processing, interpretability methods
- **Domain skills**: Digital health analytics, wearable sensor data, physiological signals (ECG, PPG, EEG, SCG, CGM), claims and EHR data
- **Programming skills**: Python, PyTorch, Spark, SQL, Sklearn, Pandas, Keras, TensorFlow, MATLAB, LaTex

PROFESSIONAL EXPERIENCE

Data Scientist, Abbott Diabetes Care R&D, Alameda, CA — January 2024 - Present

- Developed a self-supervised multi-task learning framework that improved predictive performance by 10% in low data regimes.
- Built CGM-based predictive models that achieved 32% improvement for identifying insulin reduction needs prior to GLP-1 RA initiation.
- Prototyped predictive models for lactate and evaluated them for reliability and clinical relevance.
- Conducted data analysis on EHR, claims and clinical trials, contributing to data-driven product innovation.
- Co-inventor "Using Machine Learning to modify GLP-1 Treatments based on CGM data", U.S Patent App. 63/788,340.

Research Assistant, Rice University-Houston, TX — January 2017 - January 2024

- Designed and implemented a multi-modal digital phenotyping pipeline integrating glucose, diet and activity data; causal analysis showed post-meal physical acitvity reduced elevated glucose events by 55%.
- Developed signal processing algorithm that reduces HRV estimation error by 50% in low-SNR, motion-prone camera based signals.
- Conducted large-scale analysis of textual entries to identify novel dietary patterns.
- Cross-functionally collaborated with clinicians on research involving under-served populations.

Machine Learning Research Intern, Apple Inc, Cupertino, CA — June 2020 - August 2020

- Built ML models leveraging multi-sensor data to predict cognitive load, achieving 96% accuracy.
- Designed self-attention based modality fusion neural network in PyTorch increasing robustness to missing sensor data.
- Co-inventor "Methods and systems for predicting cognitive load", U.S. Patent App. 17/554,895.

Machine Learning Research Intern, Apple Inc, Cupertino, CA — May 2019 - August 2019

- Developed CNN model for cuff-less blood pressure monitoring with 0.71 correlation to reference
- Integrated saliency mapping and domain knowledge to enhance model interpretability and domain-driven adaptation
- Co-inventor "Interpretable neural networks for cuffless blood pressure estimation", U.S. Patent App. 16/945,695.

SELECTED PUBLICATIONS

- **Pai A**, et al., "Multimodal Digital Phenotyping of Diet, Physical activity, and Glycemia in Hispanic/Latino adults with or at risk of Type 2 diabetes", NPJ Digital Medicine 2024.
- **Pai A**, Sabharwal A, "Calorie Compensation Patterns Observed in App-Based Food Diaries" in *Nutrients 2023*.
- **Pai A**, Sabharwal A, "Food Habits: Insights from Food Diaries via Computational Recurrence Measures" in *Sensors 2022*.
- **Pai A**, Veeraraghavan A, Sabharwal A, "HRVCam: robust camera-based measurement of heart rate variability" in *Journal Biomedical Optics, 2021*.
- Curtis A, **Pai A**, Cao J, Moukaddam N and Sabharwal A,"Healthsense: Software-defined Mobile-based Clinical Trials" in ACM MobiCom, 2019 (**Best Community Paper Award**).

EDUCATION

Ph.D. in Electrical and Computer Engineering, Rice University, Houston, TX — May 2023

M.S. in Electrical and Computer Engineering, Rice University, Houston, TX — December 2018

B.Tech. in Electronics and Communication Engineering, Indian Institute of Technology Dhanbad (ISM), India — May 2016