AMRUTA PAI

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EDUCATION

Ph.D. in Electrical and Computer Engineering, Rice University, Houston, TX — Expected 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, India — May 2016

RESEARCH EXPERIENCE

Scalable Health Lab - Rice University, Houston, TX — January 2017 - Present

Research Assistant, Advisor: Dr. Ashutosh Sabharwal, Mentors: Dr. Ashok Veeraraghavan, Dr. David Kerr

- Applied **causal inference methodologies** in Python and R to real-world digital health data collected from **continuous glucose monitor, Fitbit, Actigraph, and diet tracking apps (MyFitnessPal)** to study the effect of food choices and physical activity on blood glucose control.
- Analyzed **large text-based MyFitnessPal food diary dataset** using **statistical techniques** in **Python**, which resulted in the discovery of patterns of recurrent and compensatory diet behaviors.
- Led collaboration with clinical team at Sansum Diabetes Research Institute on a multimodal digital health study in an underserved Hispanic population at risk of or with type 2 diabetes.
- Reduced error in camera-based heart rate variability metrics by more than 50% for videos with dark skin and face motion by developing a novel **signal processing algorithm in MATLAB**.
- Applied state-of-the-art approaches for **remote photoplethysmography**.

PROFESSIONAL EXPERIENCE

Machine Intelligence Sensing, Apple Inc, Cupertino, CA — June 2020 - August 2020

Machine Learning Research Intern, Mentors: Dr. Erdrin Azemi, Dr. Matthias R. Hohmann, and, Dr. Joseph Yitan Cheng

- Built feature extraction pipeline and **machine learning models** using **Scikit-learn** to identify the strongest **bio-signal** modality for given task.
- Developed modality fusion algorithm with neural network in **PyTorch** that increased robustness to missing modalities.
- Provisional patent application submitted.

AI Research, Apple Inc, Cupertino, CA — May 2019 - August 2019

Machine Learning Research Intern, Mentors: Dr. Siddharth Khullar and Dr. Nicholas Apostoloff

- Developed **deep neural networks** for dense **time-series physiological signals** for blood pressure estimation in **Keras**.
- Designed an algorithmic framework that used domain knowledge and **saliency maps** for **interpretability** quantification of the deep neural network.
- S Khullar, NE Apostoloff, **A Pai**, "Interpretable neural networks for cuffless blood pressure estimation", U.S. Patent App. 16/945,695.

RELEVANT PUBLICATIONS

- **Pai A**, et al., "Multimodal digital monitoring for meal characterization in Hispanic/Latino adults with or at risk of type 2 diabetes mellitus", In preparation.
- **Pai A**, Sabharwal A, "Leveraging App-based Food Diaries for Characterization of Free-living Calorie Compensation", Submitted to *The Web Conference 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*.
- **Pai A**, Veeraraghavan A, Sabharwal A,"CameraHRV: Robust measurement of heart rate variability using a camera" in *SPIE BIOS Symposium, 2018*.
- **Pai A**, Santiago R, Bevier W, Glantz N, Barua S, Sabharwal A, Kerr D; "653-P: Post-Breakfast Glycemic Profiles in Hispanic/Latino Adults with or at Risk of Type 2 Diabetes" in *ADA 2022*.

LEADERSHIP ACTIVITIES

- Coordinated PATHS-UP Research Experience for Undergraduates Program (REU) at Rice University in summer 2022.
- Vice President Culture of Inclusion ((Student Leadership Council), NSF ERC PATHS-UP (October 2018 - Present).
- Overall Class Representative of Class 2016, IIT(ISM) Dhanbad (July 2015 - July 2016).