Patrick Kasl he/him

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EDUCATION

University of California–San Diego Expected: Early 2024
Ph.D. Student – Shu Chien-Gene Lay Department of Bioengineering

University of Wisconsin–Madison May 2020 3.97
Biomedical Engineering (BS)

WORK EXPERIENCE

Aptima **Woburn, MA**
Research Engineer Intern June 2023 - Present

- Prototyped real-time gait instability algorithm based on wearable accelerometry in Python and implemented in Dart
- Tested implementation of real-time IoT system based on InfluxDB, RabbitMQ, and FastAPI, packaged in Docker
- Developed new methods for real-time sensor data visualization
- Implemented memory caching into backend architecture, enabling users to dynamically adjust algorithm alert thresholds

Smarr Lab, Halıcıoğlu Data Science Institute **La Jolla, CA**
Fever Onset Detection Using Wearable Device Data March 2021 – Present

- Developed state-of-the-art fever detection classifier using wearable device data; first author, recently submitted
- The model utilizes physiological meaningful features and a simple machine learning architecture (sklearn)
- Characterized decision boundaries using dimensionality reduction and explainability using feature importance

Benchmarking State-of-the-Art Illness Detection Algorithms across Open Source Datasets

- Thesis research focuses on describing benchmark datasets and state-of-the-art models for illness onset detection using wearable device data
- Quantifying tradeoffs at the intersection of model: complexity, computational costs, explainability, and generalizability

Metrics from Wearable Devices as Candidate Predictors of Antibody Response Following Vaccination against COVID-19

- Led data engineering (AWS), visualization, and statistical analysis resulting in a co-first author publication

General Electric **Madison, WI**
Validation & Verification Co-op March 2020 - August 2020

- Identified hardware issues in a COVID-19 emergency ventilator, leading to a manufacturing design change
- Developed/performed tests to determine the accuracy and repeatability of tidal volume delivered during ventilation

Goessling Lab, Harvard Stem Cell Institute **Boston, MA**
Research Intern June 2019 - August 2019

- Analyzed sequencing data (R, Seurat) from NAFLD using a novel single-cell RNA sequencing technique (Seq-Well)

EXTRACURRICULAR ACTIVITIES

Bioengineering Graduate Society (BEGS) **La Jolla, CA**
President May 2022 - May 2023

- Led a 300+ person organization, coordinated meetings between the executive board, planned events, developed budget, facilitated interactions between sub-committees and esteemed faculty

SKILLS

- *General Python development:* Pandas, Numpy, Multiprocessing
- *Data visualization:* Matplotlib, Seaborn, Plotly, Bokeh
- *Machine learning and algorithm development*: Sklearn, PyTorch, PyTorch Lightning,
- *Statistical analysis:* SciPy, Statsmodels, custom statistical functions as needed
- *Familiarity (most to least):* Docker, AWS, SQL, Dart, R, HTML/CSS/JavaScript, InfluxDB, RabbitMQ, memcached, FastAPI, React