

# Patrick Kasl<sup>he/him</sup>

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## EDUCATION

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### 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

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### Aptima

Woburn, MA

*Research Engineer Intern*

June 2023 - Present

- Tested implementation of real-time IoT system based on InfluxDB, RabbitMQ, and FastAPI, packaged in Docker
- Developed and implemented new algorithms to enable real-time data analysis and user interaction for dynamically setting thresholds, enhancing system monitoring and alerting capabilities
- Integrated memory caching into backend architecture, facilitating efficient data processing and algorithm adjustment

### Smarr Lab, Halicioğlu 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; submitted to *The Lancet Digital Health*
- 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, 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

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### 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

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- *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, R, HTML/CSS/JavaScript, InfluxDB, RabbitMQ, memcached, FastAPI, React, Dart/Flutter