Patrick Kasl

📞 651-343-5118   ✉ patrick.j.kasl@gmail.com   🔗 linkedin.com/patrick-j-kasl   🌐 patrick-kasl.github.io   📍 NYC

EDUCATION

University of California–San Diego — May 2024
Doctor of Philosophy in Bioengineering

University of Wisconsin–Madison — May 2020
Bachelor of Science in Biomedical Engineering

PROFESSIONAL EXPERIENCE

Know Labs — May 2024 – Present
Data Scientist — *Seattle, WA (Remote)*

- Developed and implemented ML models for glucose estimation and prediction using dielectric spectroscopy-based sensor measurements
- Diagnosed changes in prototype stability using historical sensor measurements
- Examined performance of prototype relative to Vector Network Analyzer (VNA) measurements
- Investigated circadian and physiological variations in blood glucose levels, analyzing temporal patterns and their correlation with sensor data
- Collaborated across teams to identify strategic research goals and implement new device verification methods

Aptima — June 2023 – May 2024
Research Engineer Intern — *Woburn, MA*

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

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

- Identified hardware issues in a COVID-19 emergency ventilator, leading to a manufacturing design change in 50,000 ventilators

RESEARCH EXPERIENCE

Smarr Lab, Halıcıoğlu Data Science Institute — March 2021 – May 2024
Analysis of Wearable Datasets and the Generalizability of Acute Illness Monitoring Models — *La Jolla, CA*

- Conducted the first generalizability study of large, longitudinal wearable device datasets and acute illness detection models; *winner of best paper award at CHIL 2024*

Fever Onset Detection Using Wearable Device Data

- Utilized physiologically meaningful features derived from wearable device to develop a machine-learning model acheiving SOTA illness detection performance
- Characterized decision boundaries using dimensionality reduction and explainability using feature importance

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

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

Thomson Lab, Morgridge Institute for Research — August 2018 – May 2020
Tissue Engineering an Implantable Blood Vessel Graft — *Madison, WI*

- Designed and fabricated microfluidic graft holders to aid iPSC maturation under external peristaltic flow
- Generated and analyzed bulk RNA sequencing data, characterizing endothelial differentiation

Goessling Lab, Harvard Stem Cell Institute — June 2019 – August 2019
Hepatocellular Responses to Chronic Non-Alcoholic Fatty Liver Disease — *Boston, MA*

- Characterized NAFLD hepatocytes using immunofluorescence and novel single-cell RNA sequencing technique

Selected publications

[1] **P. Kasl**, S. Soltani, L. Keeler Bruce, *et al.*, "A cross-study analysis of wearable datasets and the generalizability of acute illness monitoring models," in *Proceedings of the fifth Conference on Health, Inference, and Learning*, T. Pollard, E. Choi, P. Singhal, *et al.*, Eds., ser. Proceedings of Machine Learning Research, vol. 248, PMLR, 27–28 Jun 2024, pp. 644–682. [Online]. Available: https://proceedings.mlr.press/v248/kasl24a.html,
    *Best paper award.

[2] **P. Kasl**, L. Keeler Bruce, W. Hartogensis, *et al.*, "Utilizing Wearable Device Data for Syndromic Surveillance: A Fever Detection Approach," *Sensors*, vol. 24, no. 6, p. 1818, Jan. 2024. DOI: 10.3390/s24061818.

[3] A. E. Mason*, **P. Kasl***, W. Hartogensis, *et al.*, "Metrics from Wearable Devices as Candidate Predictors of Antibody Response Following Vaccination against COVID-19: Data from the Second TemPredict Study," *Vaccines*, vol. 10, no. 2, p. 264, 2 Feb. 2022. DOI: 10.3390/vaccines10020264.

[4] A. E. Mason, **P. Kasl**, S. Soltani, *et al.*, "Elevated body temperature is associated with depressive symptoms: Results from the TemPredict Study," *Scientific Reports*, vol. 14, no. 1, p. 1884, 1 Feb. 5, 2024. DOI: 10.1038/s41598-024-51567-w.

[5] L. K. Bruce, **P. Kasl**, S. Soltani, *et al.*, "Variability of temperature measurements recorded by a wearable device by biological sex," *Biology of Sex Differences*, vol. 14, no. 1, p. 76, Nov. 1, 2023. DOI: 10.1186/s13293-023-00558-z.

[6] S. Purawat, S. Dasgupta, J. Song, *et al.*, "TemPredict: A Big Data Analytical Platform for Scalable Exploration and Monitoring of Personalized Multimodal Data for COVID-19," in *2021 IEEE International Conference on Big Data (Big Data)*, Dec. 2021, pp. 4411–4420. DOI: 10.1109/BigData52589.2021.9671441.

Extracurricular Activities

Bioengineering Graduate Society (BEGS)   May 2022 – May 2023
President   *La Jolla, CA*
- Led a 300+ person organization, coordinated meetings between the executive board, planned events, developed budget, and facilitated interactions between sub-committees and esteemed faculty

UW-Varsity Football   June 2016 – August 2018
Student-Athlete   *Madison, WI*
- Dedicated up to 60 hours a week, year-round developing skills including time management, teamwork, ability to take criticism, and performance under pressure

Technical 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): SQL, LaTeX, Docker, AWS, Dart, R, HTML/CSS/JavaScript, InfluxDB, RabbitMQ, memcached, FastAPI, React

References

Benjamin Smarr, Assistant Professor
Bioengineering and Data Science,
University of California–San Diego
(206) 375-5156, bsmarr@ucsd.edu

Mahi Karim
Head of Machine Learning and Data Science
Know Labs
(860) 706-6511, mahi83@gmail.com