

# Patrick Kasl

☎ 651-343-5118   ✉ [pkasl@ucsd.com](mailto:pkasl@ucsd.com)   [linkedin.com/patrick-j-kasl](https://www.linkedin.com/in/patrick-j-kasl)   [patrick-kasl.github.io](https://github.com/patrick-kasl)

## EDUCATION

### University of California–San Diego

Expected: Spring 2024

*Doctor of Philosophy in Bioengineering (GPA: 3.97 / 4.00)*

### University of Wisconsin–Madison

May 2020

*Bachelor of Science in Biomedical Engineering (GPA: 3.97 / 4.00)*

## RESEARCH EXPERIENCE

### Smarr Lab, Halicioğlu Data Science Institute

March 2021 – Present

*Fever Onset Detection Using Wearable Device Data*

*La Jolla, CA*

- Developed and characterized a fever detection classifier using wearable device data
- Utilized physiologically meaningful features and a simple machine-learning architecture to achieve S.O.T.A. illness detection performance
- Characterized decision boundaries using dimensionality reduction and explainability using feature importance

### *A Cross-study Analysis of Wearable Datasets and the Generalizability of Acute Illness Monitoring Models*

- Conducted the *first* generalizability study of large, longitudinal wearable device datasets and acute illness detection models
- Quantified tradeoffs at the intersection of model: complexity, explainability, and generalizability

### *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*

- Developed and fabricated microfluidic culture devices for holding grafts during iPSC maturation
- Programmed peristaltic pump to create flow profiles that apply physiological shear and flow values to maturing grafts
- Implemented custom MATLAB script to analyze the accuracy of flow profiles
- Generated and analyzed bulk RNA sequencing data for characterizing undesired side populations arising in 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 staining in histological sections, proposing and implementing background reduction techniques for imaging of low contrast IHC fluorescence markers
- Profiled NAFLD livers using a novel single-cell RNA sequencing technique (Seq-Well)
- Analyzed sequencing data and determined candidate genetic markers for pre-cancerous cell type

## PROFESSIONAL EXPERIENCE

### Aptima

June 2023 – Present

*Research Engineer Intern*

*Woburn, MA*

- Prototyped real-time gait instability algorithm using wearable accelerometry in Python and implemented in Dart, leading to continuation of funding of project under small business grant
- 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 for IoT system
- 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
- Developed & performed tests to determine the accuracy and repeatability of tidal volume delivered during ventilation

## PUBLICATIONS

---

- [1] 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, ISSN: 2076-393X. DOI: 10.3390/vaccines10020264. [Online]. Available: <https://www.mdpi.com/2076-393X/10/2/264>.
- [2] 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, ISSN: 2045-2322. DOI: 10.1038/s41598-024-51567-w. [Online]. Available: <https://www.nature.com/articles/s41598-024-51567-w>.
- [3] 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, ISSN: 2042-6410. DOI: 10.1186/s13293-023-00558-z. [Online]. Available: <https://doi.org/10.1186/s13293-023-00558-z>.
- [4] 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. [Online]. Available: [https://ieeexplore.ieee.org/abstract/document/9671441?casa\\_token=2XUVONFGZHoAAAAA:IeDj51kmoExoLq3N8J4YwbMguVTk21qhieKipTSFYetCbutiWik2Rn02pECdEeXukSf8m90](https://ieeexplore.ieee.org/abstract/document/9671441?casa_token=2XUVONFGZHoAAAAA:IeDj51kmoExoLq3N8J4YwbMguVTk21qhieKipTSFYetCbutiWik2Rn02pECdEeXukSf8m90).
- [5] H. Kletzien, S. M. Wang, **P. Kasl**, and N. P. Connor, “Lingual Muscle Plasticity with Age and Exercise,” *Dysphagia*, vol. 34, no. 3, pp. 463–464, May 22, 2022, ISSN: 0179051X. [Online]. Available: <https://go.gale.com/ps/i.do?p=HRCA&sw=w&issn=0179051X&v=2.1&it=r&id=GALE%7CA743677361&sid=googleScholar&linkaccess=abs>.

## UNDER REVIEW

---

- [1] **P. Kasl**, S. Soltani, L. K. Bruce, *et al.*, “A Cross-study Analysis of Wearable Datasets and the Generalizability of Acute Illness Monitoring Models,” *Under Review: Conference on Health, Inference, and Learning*, Feb. 16, 2024.
- [2] **P. Kasl**, L. K. Bruce, W. Hartogensis, *et al.*, “Utilizing wearable device data for syndromic surveillance: A fever detection approach,” *Under Review: Sensors*, Jan. 30, 2024.

## CONFERENCE PRESENTATIONS

---

- 1. **Kasl P.**, Brandl A., Liu B. Cardiotoxicity Drug Assay. Presented at the 2018 SCRMC Fall Conference, September 21, 2018, Madison, Wisconsin.
- 2. **Kasl P.**, Walesky C., Goessling W. Hepatocellular Responses to Non-Alcoholic Fatty Liver Disease. Presented at the HIP Conference, August 16, 2019, Cambridge, Massachusetts.
- 3. Kletzien H., Wang S., **Kasl P.**, Connor NP. Lingual Muscle Plasticity with Age and Exercise. Presented at the 2018 meeting of the Japanese Society of Dysphagia Rehabilitation and the 2018 Japanese-Korean Joint Swallowing Conference. September 7-9, 2018, Sendai, Japan.

## AWARDS & HONORS

---

<i>Theodore Herfurth Award for Comprehensive Undergraduate Excellence</i>	2020
<ul style="list-style-type: none"><li>• 1 of 2 seniors in a graduating class of 7,671; awarded to students who made the most effective use of time in their undergraduate studies</li></ul>	
<i>Joshua Plantz Honorary Scholarship</i>	2019
<ul style="list-style-type: none"><li>• \$3,000 honorary scholarship</li></ul>	
<i>Nominated for Goldwater Scholarship</i>	2019
<ul style="list-style-type: none"><li>• One of four students nominated by UW-Madison for Goldwater Scholarship</li></ul>	
<i>Vilas Merit Scholar</i>	2018 – 2019
<i>Dean's List</i>	2016 – 2020
<ul style="list-style-type: none"><li>• 8 of 8 semesters</li></ul>	
<i>Full Ride Athletic Scholarship</i>	2016 – 2018
<ul style="list-style-type: none"><li>• Full tuition and stipend scholarship (~\$60,000/year) awarded to recruited varsity athletes</li></ul>	

## EXTRACURRICULAR ACTIVITIES

---

<b>Bioengineering Graduate Society (BEGS)</b>	May 2022 – May 2023
<i>President</i>	<i>La Jolla, CA</i>
<ul style="list-style-type: none"><li>• Led a 300+ person organization, coordinated meetings between the executive board, planned events, developed budget, facilitated interactions between sub-committees and esteemed faculty</li></ul>	
<b>UW-Varsity Football</b>	June 2016 – August 2018
<i>Student-Athlete</i>	<i>Madison, WI</i>
<ul style="list-style-type: none"><li>• Dedicated up to 60 hours a week, year-round developing skills including time management, teamwork, ability to take criticism, and performance under pressure</li></ul>	

## 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