

SARAH JIANG

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Summary

NSF Graduate Research Fellow and PhD student with 4+ years of experience building machine learning models, developing scalable data pipelines, and deploying full-stack applications. Skilled in data engineering, time-series forecasting, and ML. Experienced with Python, SQL, cloud platforms, web development, and modern ML frameworks.

Education

Duke University

PhD in Biomedical Engineering

Expected Graduation: May 2030

- Activities: Graduate Teaching Assistant (BME 790: BME Data Science)
- Coursework: Statistical Methods, Probability, Deep Learning, Linear Models, Real Analysis

Duke University

BSE in Biomedical Engineering & Computer Science

- Activities: Head Teaching Assistant Data Science, Embedded Systems Grader, Rhythm & Blue A Cappella (President)
- Coursework: Data Structures, Algorithms, Database Systems, Data Science, Signal Processing, Imaging Systems

Honors & Awards

Graduate Research Fellowship

National Science Foundation, Spring 2025

Theo C. Pilkington Memorial Award

Duke University, Spring 2025

Established in 1993 by the Whitaker Foundation in memory of Theo C. Pilkington, this award recognizes one student in the graduating class demonstrating outstanding perseverance and accomplishment in the study of biomedical engineering.

Independent Study Research Grant

Duke University, Fall 2024

Conference Travel Grant

Duke University, Fall 2024

Dean's List with Distinction

Duke University, Fall 2021

Publications & Presentations

S. Jiang, A. Aakarsh, Z. Xu, Z. Shuai, C. Zhuang, Y. Yang, “*Inertia-1: An Open Exploration of Wearable Motion Foundation Models*,” in preparation for *NeurIPS*, Apr. 2026.

M. M. H. Shandhi, H. Jeong, **S. Jiang**, P. Ashar, S. Kavirajuni, A. V. Kotla, M. Fudim, H. Pontzer, W. E. Kraus, J. Dunn, “*Assessment of Cardiorespiratory Fitness and Functional Capacity: From Clinics to Real-World Settings*,” under review, Aug. 2025.

S. Jiang, P. Ashar, M. M. H. Shandhi, and J. Dunn, “*Demographic reporting in biosignal datasets: a comprehensive analysis of the PhysioNet open access database*,” *The Lancet Digital Health*, vol. 6, no. 11, pp. e871–e878, Oct. 2024. doi: 10.1016/S2589-7500(24)00170-5.

L. Lederer, M. Liu, B. Chen, **S. Jiang**, S. Kim, D. MacKenzie, E. Ho, G. Guerreri, A. Roghani, J. Dunn, “*Determinants of Opioid Use Disorder Relapse from the Biopsychosocial Perspective: A Systematic Review*,” Poster Presentation, Jan. 2025 CERSI Summit, San Francisco, CA.

S. Jiang, J. Dunn, “*Analyzing Demographic Data Gaps in the PhysioNet Open Access Database: Toward Mitigating AI Bias in Biosignal Algorithms*,” Poster Presentation, Oct. 2024 Biomedical Engineering Society (BMES), Baltimore, MD.

L. Lederer, M. Liu, B. Chen, **S. Jiang**, S. Kim, D. MacKenzie, E. Ho, G. Guerreri, A. Roghani, J. Dunn, “*Determinants of Opioid Use Disorder Relapse: A Systematic Review*,” under review at the FDA, Aug. 2024.

P. Yang, **S. Jiang**, J. Wang, P. Chang, S. Sakai, A. Chompre, D. Bajaj, A. Kakaati, B. Chen, L. Lederer, K. Singh, P. Cho, A. Roghani, J. Dunn, “*Improving Infection Detection with Wearable Device Data*,” Poster Presentation, May 2023 Bass Connections Research Symposium, Durham, NC.

A. Chompre, **S. Jiang**, P. Yang, “*Improving infection detection efficiency with wearables*,” Poster Presentation, Aug. 2022 Data+ Symposium, Durham, NC.

Research Projects

Movement Foundation Models

May 2025 - Present

UCLA – Advised by Yuzhe Yang.

- Benchmarking 6 self-supervised learning objectives for multimodal wearable biosignals (accelerometer, gyroscope, magnetometer) trained on 150M+ minutes of high-frequency data.
- Designed scalable pretraining and evaluation pipelines across 15 downstream datasets (spanning HAR, disease classification, gait analysis) and 6 axes of data configurations (in prep. for NeurIPS 2026).

PhysioNet Database Systematic Review

May 2023 - Oct 2024

Duke University – Advised by Jessilyn Dunn, Mobashir Shandhi.

- Led audit of 170+ biosignal datasets in PhysioNet to quantify demographic representation and reporting practices.
- Identified systematic gaps in demographic coverage and proposed standardized reporting frameworks to improve fairness and generalizability in ML models trained on publicly available biosignal data.

Wearable Infection Detection Engine

August 2023 - May 2025

Duke University – Advised by Jessilyn Dunn, Peter Cho.

- Built predictive tree-based models integrating wearable time-series, EHR, and COVID-19 testing data to characterize pre-symptomatic infection; focusing on wearable data collected via Garmin, Fitbit, and Apple Watch watches.
- Engineered signal-derived features (e.g., wear-time and missingness patterns, HR/HRV dynamics) using statistical and ML methods to improve early detection performance (over 24 hours prior to test, AUROC 0.73).

Opioid Use Disorder Systematic Review

May 2024 - Aug 2024

Duke University – Advised by Jessilyn Dunn, Lauren Lederer.

- Co-authored systematic review analyzing biosignal and behavioral predictors of opioid relapse and craving.
- Synthesized evidence on social determinants of health to inform wearable prediction models for relapse risk.

Cardiorespiratory Fitness & Functional Capacity Review

Feb 2022 - Aug 2025

Duke University – Advised by Jessilyn Dunn, Mobashir Shandhi.

- Co-authored scoping review evaluating the validity of wearable biosensors and wearable-derived metrics (HR, HRV, SpO2, activity, sleep) against gold-standard clinical measures for evaluation cardiorespiratory fitness.
- Analyzed methodological gaps in translating wearable signals to clinically actionable fitness and functional capacity outcomes.

Professional Service

Reviewer, IEEE EMBS Conference on Healthcare Innovation - Point-of-Care Technologies (HI-POCT) 2024

Work & Teaching Experience

Mantis Biotech | Founding Machine Learning Engineer

Oct 2025 - Present

Founding MLE for startup building biomedical infrastructure to streamline development for FDA approval

- Building infrastructure for biomedical startups to seamlessly create a simulation pipeline
- Developing ML tools for injury prevention and maximizing player performance for athletics client

Duke University | Head Teaching Assistant

Aug 2022 - May 2025

Head undergraduate TA for CS 216: Intro to Data Science, EGR 101: Engineering Design & Communication.

- Developed curriculum final data science application project, created updated demo materials from previous 2020 demo milestones and led teams of 10 UTAs each semester to guide and provide feedback for 80+ student teams
- Created weekly and monthly check-in points for student teams and open forms for students to report concerns throughout the semester
- Guided 4 student teams through the engineering design process to present deliverables to local clients via semester-long design projects

RecycleHealth | Full Stack Developer

May 2024 - May 2025

National non-profit that collects, refurbishes, and distributes wearable devices to low-resource communities.

- Designed a full-stack web app to track 2,000+ wearables to streamline data input and reduce manual errors
- Enabled real-time inventory tracking, user auth., and visualization via SQL and Flask backend on Render

Duke BIG IDEAs Lab | Full Stack Developer

May 2022 - May 2023

Building flexible applications to streamline large-scale data collection, processing, and storage for biomedical research.

- Built Azure/Python/HTML based web app to navigate between surveys, wearable data, and user login and account data
- Connected Garmin, Fitbit, Apple HealthKit APIs to web app for device account and research account linkage
- Utilized cron jobs to continuously batch pull weekly data into Azure database upon user authorization

Technical Skills

Languages: Python, SQL, HTML/CSS

Frameworks: PyTorch, Tensorflow, Scikit-learn, Flask, Django, FastAPI

DevOps/Infra: Azure, AWS, Render