

WILLIAM JONGWON HAN

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EDUCATION

PhD in Mechanical Engineering

Carnegie Mellon University, College of Engineering

Aug. 2023 - Present

Pittsburgh, PA

BA in Psychological Science

University of California, Irvine, School of Social Science

Sep. 2020 - Jun. 2022

Irvine, CA

RESEARCH INTEREST

William Han's research focuses on multimodal learning, with a particular interest in physiological signals for applications in cognitive science, embodied artificial intelligence (AI), and healthcare. His work spans vision and language, as well as the exploration of connections and interactions between heterogeneous modalities. Recently, his research have centered on multimodal representation learning, specifically integrating electrocardiograms (ECGs) and text.

SELECTED PUBLICATIONS AND PREPRINTS

- **William Han**, Chaojing Duan, Michael Rosenberg, Emerson Liu, Ding Zhao. "ECG-Byte: A Tokenizer for End-to-End Generative Electrocardiogram Language Modeling." ArXiv.org, 18 Dec. 2024, arxiv.org/abs/2412.14373.
- **William Han**, Diana Gomez, Avi Alok, Chaojing Duan, Michael Rosenberg, Douglas Weber, Emerson Liu, Ding Zhao. Interpretation of Intracardiac Electrograms Through Textual Representations. ArXiv.org, 1 Feb. 2024, arxiv.org/abs/2402.01115. **CHIL 2024**.
- Jielin Qiu*, Jiacheng Zhu*, Shiqi Liu, **William Han**, Jingqi Zhang, Chaojing Duan, Michael Rosenberg, Emerson Liu, Douglas Weber, Ding Zhao. Automated Cardiovascular Record Retrieval by Multimodal Learning between Electrocardiogram and Clinical Report. ArXiv.org, 13 Apr. 2023, arxiv.org/abs/2304.06286. **Machine Learning for Health 2023**.
- Jielin Qiu*, **William Han***, Jiacheng Zhu, Mengdi Xu, Michael Rosenberg, Emerson Liu, Douglas Weber, Ding Zhao. "Transfer Knowledge from Natural Language to Electrocardiography: Can We Detect Cardiovascular Disease through Language Models?" ArXiv:2301.09017 [Cs], 21 Jan. 2023, arxiv.org/abs/2301.09017. **EACL 2023 Findings**.

OTHER PUBLICATIONS AND PREPRINTS

- Xilun Zhang*, Shiqi Liu*, Peide Huang, **William Han**, Yiqi Lyu, Mengdi Xu, Ding Zhao. "Dynamics as Prompts: In-Context Learning for Sim-To-Real System Identifications." ArXiv.org, 27 Oct. 2024, arxiv.org/abs/2410.20357. **RA-L 2025**.
- Jielin Qiu*, **William Han***, Xuandong Zhao, Shangbang Long, Christos Faloutsos, Lei Li . Evaluating Durability: Benchmark Insights into Multimodal Watermarking. ArXiv.org, 6 Jun. 2024, arxiv.org/abs/2406.03728v1. **DMLR 2024**.
- Jielin Qiu, **William Han**, Winfred Wang, Zhengyuan Yang, Linjie Li, Jianfeng Wang, Christos Faloutsos, Lei Li, Lijuan Wang. Entity6K: A Large Open-Domain Evaluation Dataset for Real-World Entity Recognition. ArXiv.org, 19 Mar. 2024, arxiv.org/abs/2403.12339.
- Jielin Qiu , Jiacheng Zhu , **William Han**, Aditesh Kumar, Karthik Mittal, Claire Jin, Zhengyuan Yang, Linjie Li, Jianfeng Wang, Bo Li, Ding Zhao, Lijuan Wang. MultiSum: A Dataset for Multimodal Summarization and Thumbnail Generation of Videos. [arXiv.org. doi:https://doi.org/10.48550/arXiv.2306.04216](https://arxiv.org/abs/2306.04216). **CVPR 2024 (highlight, 11.9%)**.

- Jieliu Qiu*, Mengdi Xu*, **William Han***, Seungwhan Moon, Ding Zhao. Embodied Executable Policy Learning with Language-based Scene Summarization. [online] arXiv.org. doi:<https://doi.org/10.48550/arXiv.2306.05696>. **NAACL 2024**.
- **William Han***, Jieliu Qiu*, Jiacheng Zhu, Mengdi Xu, Douglas Weber, Bo Li, Ding Zhao. Can Brain Signals Reveal Inner Alignment with Human Languages? ArXiv:2208.06348 [Cs, Q-Bio], 10 Aug. 2022, arxiv.org/abs/2208.06348. **EMNLP 2023 Findings**.

EXPERIENCE

Research Intern

Allegheny General Hospital

May 2024 - Present

Pittsburgh, PA

- Work on deep learning for cardiac electrophysiology.

Research Intern

Honda Research Institute, USA

Oct. 2022 - Apr. 2023

San Jose, CA

- Develop algorithms for visual-language navigation and vision question answering.
- Work on object detection, visual relation detection, and scene graph generation for micromobility applications.

Research Intern

Carnegie Mellon University; Safe AI Lab

Mar. 2022 - Mar. 2023

Remote, CA

- Work on reinforcement learning for embodied AI using image captioning and large language models.
- Research on intersections between natural language processing and physiological signals and their applications in downstream tasks, such as sentiment analysis, disease detection, and relation detection.

Research Intern

University of California, Irvine; Center for Artificial Intelligence in Diagnostic Medicine

Dec. 2021 - Dec. 2022

Irvine, CA

- Construct U-Net for segmentation of blood vessels in histopathological images for Alzheimer's Disease.
- Design algorithms for detection and segmentation of invasive, in situ, and normal cells in histopathological images using transfer learning.

Machine Learning Engineer Intern

Foretify.ai

Jun. 2022 - Oct. 2022

Remote, CA

- Create and deploy multiple geographic information system (GIS) applications through ArcGIS
- Integrate machine learning models into GIS to do tasks such as travel safety prediction, solar panel construction forecasting, object detection, and chatbot.
- Develop GANs for generating cartographic maps from satellite imagery.

Tutor

One2One Tutoring

Jan. 2020 - Oct. 2022

Remote, CA

- Teach Mathematics, Social Studies, Science, and English for 40+ students in grades 6 through 12.

EXTRA-CURRICULAR ACTIVITIES

WIKMM Project Leader

AI Club at UCI

Sep. 2021 - Jun. 2022

Irvine, CA

- Lead a team of 5 AI club members and establish WIKMM, a project that aims to build state of the art classification and segmentation models for invasive, in situ, and normal cells in histopathological images.

SEW.NLP Group Leader

UCI Machine Learning Hackathon 2022

May 2022 - Jun. 2022

Irvine, CA

- Lead a group of 3, including myself, and build a Question Answering model pretrained on BERT and XLNet for scientific documents in the UCI ML repository.

pests.ai Group Leader

AI LA Open Innovation Challenge 2022

Mar. 2022 - Apr. 2022

Los Angeles, CA

- Lead a group of 5, including myself, and develop an GIS application for predicting and mapping potential areas goldspotted oak borers (GSOB) and invasive shothole borers (ISHB) might infiltrate.

HONORS/AWARDS

- Graduate Research Fellowship from College of Engineering, CMU 2023 - 2028
- Overall Runner Up (2nd place) for UCI Machine Learning Hackathon 2022
- Overall Runner Up (2nd place) for AI LA Open Innovation Challenge 2022
- Best Project Proposal Award 2021 for AI Club at UCI
- Dean's List, UCI 2020 - 2022

TALKS

Can Brain Signals Reveal Inner Alignment with Human Languages?

Jul. 2023

Oral Presentation at ICML Workshop 2023 Machine Learning for Multimodal Healthcare Data

Honolulu, HI

Embodied Executable Policy Learning with Language-based Scene Summarization.

Jul. 2023

Oral Presentation at ICML Workshop 2023 Interactive Learning with Implicit Human Feedback

Honolulu, HI

Towards Interpretable Representation Learning for Physiological Signals.

Aug. 2024

Invited Talk at National Autonomous University of Mexico (UNAM)

Mexico City, Mexico

PROFESSIONAL SERVICES

Reviewer

CVPR (2023), NeurIPS (2023), ICML (2023), EMNLP (2023), ICLR (2024, 2025)

Organization

Research Roundtable Junior Chair at Machine Learning for Health 2023

TEACHINGS

- **CMU AI for Humanities (82-183)**

Feb. 2024

Guest Lecture on LLMs in Healthcare.

Pittsburgh, PA

- **Machine Learning and Artificial Intelligence for Engineers (24-787)**

Jan. 2025

Head Teaching Assistant.

Pittsburgh, PA

MENTORED STUDENTS

- Avi Alok, M.S. Student at CMU → Data Scientist at HiLabs
- Sohum Gautam, High School Student → UPenn M&T Program

SKILLS

Technical Skills Python, Pytorch, TensorFlow, Linux, C/C++, MATLAB, CUDA, OpenCV, R, JavaScript, Rust

Soft Skills Leadership, Communication, Management, Teaching, Research, Learning