WILLIAM JONGWON HAN

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EDUCATION

PhD in Mechanical Engineering   Aug. 2023 - Present
Carnegie Mellon University, College of Engineering   *Pittsburgh, PA*

BA in Psychological Science   Sep. 2020 - Jun. 2022
University of California, Irvine, School of Social Science   *Irvine, CA*

RESEARCH INTEREST

William Han's research interest is in multimodal learning, particularly with physiological signals, for applications in cognition, robotics, and healthcare. He also works with vision and language. He is interested in discovering and applying mathematical and statistical techniques (e.g. canonical correlation analysis, optimal transport) to combat the challenges of translation, alignment, fusion, co-learning, and representation of heterogeneous data.

PUBLICATIONS AND PREPRINTS

- 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. Under Review.

- Jielin Qiu*, Jiacheng Zhu*, Shiqi Liu, **William Han**, Jingqi Zhang, Chaojing Duan, Michael Rosenberg, Emerson Liu, Douglas Weber, Ding Zhao. "Converting ECG Signals to Images for Efficient Image-Text Retrieval via Encoding." ArXiv.org, 13 Apr. 2023, arxiv.org/abs/2304.06286. Under Review.

- Jielin 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. ICML 2023 ILHF Workshop (spotlight).

- 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.

- **William Han***, Jielin 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/2208.063 EMNLP 2023 Findings.

EXPERIENCE

Research Intern   Oct. 2022 - Apr. 2023
Honda Research Institute, USA   *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   Mar. 2022 - Mar. 2023
Carnegie Mellon University; Safe AI Lab   *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 — Dec. 2021 - Dec. 2022
University of California, Irvine; Center for Artificial Intelligence in Diagnostic Medicine — *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 — Jun. 2022 - Oct. 2022
Foretify.ai — *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 — Jan. 2020 - Oct. 2022
One2One Tutoring — *Remote, CA*

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

EXTRA-CURRICULAR ACTIVITIES

WIKMM Project Leader — Sep 2021 - Jun 2022
AI Club at UCI — *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 — May 2022 - Jun 2022
UCI Machine Learning Hackathon 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 — Mar 2022 - April 2022
AI LA Open Innovation Challenge 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. 2029
Oral Presentation at ICML Workshop 2023 Machine Learning for Multimodal Healthcare Data — *Honolulu, HI*

Embodied Executable Policy Learning with Language-based Scene Summarization. — Jul. 2029
Oral Presentation at ICML Workshop 2023 Interactive Learning with Implicit Human Feedback — *Honolulu, HI*

PROFESSIONAL SERVICES

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

SKILLS

Technical Skills   Python, Pytorch, TensorFlow, Linux, C/C++, MATLAB, CUDA, OpenCV, R, JavaScript
Soft Skills   Leadership, Communication, Management, Teaching, Research, Learning