Wei-Hung Weng, MD, PhD

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Professional Summary

Research Scientist and Medical Doctor with a PhD in Computer Science from MIT, specializing in AI for science and medicine. Leverages extensive clinical experience to lead and contribute to cutting-edge AI projects, with a focus on developing novel multi-agent systems, deep learning models, and natural language processing techniques to advance scientific discovery and healthcare.

Work Experience

- Research scientist, Google DeepMind / Google Research, 2022/3 - Present
  - Developed a novel AI co-scientist, a multi-agent system built on a large language model designed to generate novel, testable scientific hypotheses and research proposals. The system has been validated through wet-lab experiments in multiple biomedical domains.
  - Developed AMIE (Articulate Medical Intelligence Explorer), a multimodal conversational AI system for medical diagnosis and management reasoning.
  - Developed Med-Gemini, a family of specialized large language models for medicine based on Gemini.
  - Developed a LLM-aligned representation learning method for chest X-ray images, improving performance on downstream tasks such as image retrieval and question answering.
  - Developed and validated a deep learning model for predicting cardiovascular disease risk from photoplethysmography signals, achieving performance comparable to established clinical risk scores.
  - Developed Health-enhanced Acoustic Representation (HeAR), a self-supervised learning model for health-related acoustic signals, demonstrating state-of-the-art performance on downstream health tasks.
- Research assistant, MIT Computer Science and Artificial Intelligence Laboratory (CSAIL), 2017/9 - 2022/5
  - Systematically explored the machine learning frameworks for limited data, data imbalance, and heterogeneous data, using cross-domain learning, self-supervised learning, contrastive learning, meta-learning, multitask learning, and robust learning.
    - Postdoctoral research fellow, Massachusetts General Hospital, 2015/9 - 2017/5
  - Developed a machine learning, natural language processing based technique and knowledge representation for clinical triage and undiagnosed disease identification.
- Research associate, National Taiwan University, 2014/5 - 2015/4
  - Developed the qualitative and deep learning methods to identify skin melanocytes in microscopic imaging.
- Resident physician (general medicine, pathology), Chang Gung Memorial Hospital, 2012/8 - 2014/4
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Education

- PhD in Computer Science, 2022
  - Massachusetts Institute of Technology, Cambridge, MA, USA (Supervisor: Peter Szolovits)
- MMSc in Biomedical Informatics, 2017
  - Harvard Medical School, Boston, MA, USA (Supervisor: Henry Chueh)
- MD, 2011
  - Chang Gung University, Taiwan

Recent Works [Full list in [Google Scholar](#)]

- AI co-scientist
  - Gottweis J*, **Weng WH***, Daryin A*, Tu T*, Palepu A, Sirkovic P, Myaskovsky A, Weissenberger F, Rong K, Tanno R, Saab K, et al. Towards an AI co-scientist. arXiv preprint arXiv:2502.18864. 2025 Feb 26. Submitted to journal.

- - Penadés JR, Gottweis J, He L, Patkowski JB, Shurick A, **Weng WH**, Tu T, Palepu A, Myaskovsky A, Pawlosky A, Natarajan V, et al. AI mirrors experimental science to uncover a novel mechanism of gene transfer crucial to bacterial evolution. bioRxiv. 2025 Feb 19:2025-02. Submitted to journal.
  - Guan Y, Inchai J, Fang Z, Law J, Brito AA, Pawlosky A, Gottweis J, Daryin A, Myaskovsky A, Ramakrishnan L, Palepu A, Kulkarni K, **Weng WH**, et al. AI-assisted Drug Re-purposing for Human Liver Fibrosis. bioRxiv. 2025:2025-04.
- AMIE
  - Saab K, Freyberg J, Park C, Strother T, Cheng Y, **Weng WH**, Barrett DG, Stutz D, Tomasev N, Palepu A, Liévin V, et al. Advancing Conversational Diagnostic AI with Multimodal Reasoning. Submitted to journal.
  - Palepu A, Liévin V, **Weng WH**, Saab K, Stutz D, Cheng Y, Kulkarni K, Mahdavi SS, Barral J, Webster DR, Chou K, et al. Towards conversational AI for disease management. arXiv preprint arXiv:2503.06074. 2025 Mar 8. Submitted to journal.
  - Palepu A, Dhillon V, Niravath P, **Weng WH**, Prasad P, Saab K, Tanno R, Cheng Y, Mai H, Burns E, Ajmal Z, et al. Exploring Large Language Models for Specialist-level Oncology Care. arXiv preprint arXiv:2411.03395. 2024 Nov 5. Submitted to journal.
  - O'Sullivan JW, Palepu A, Saab K, **Weng WH**, Cheng Y, Chu E, Desai Y, Elezaby A, Kim DS, Lan R, Tang W, et al. Towards Democratization of Subspeciality Medical Expertise. arXiv preprint arXiv:2410.03741. 2024 Oct 1. Submitted to journal.
- Med-Gemini
  - Saab K*, Tu T*, **Weng WH***, Tanno R*, Stutz D, Wulczyn E, Zhang F, Strother T, Park C, Vedadi E, Chaves JZ, et al. Capabilities of gemini models in medicine. arXiv preprint arXiv:2404.18416. 2024 Apr 29.
  - Yang L, Xu S, Sellergren A, Kohlberger T, Zhou Y, Ktena I, Kiraly A, Ahmed F, Hormozdiari F, Jaroensri T, Wang E, et al. Advancing multimodal medical capabilities of Gemini. arXiv preprint arXiv:2405.03162. 2024 May 6.
- Medical vision and signals
  - **Weng WH**, Sellergen A, Kiraly AP, D'Amour A, Park J, Pilgrim R, Pfohl S, Lau C, Natarajan V, Azizi S, Karthikesalingam A, et al. An intentional approach to managing bias in general purpose embedding models. The Lancet Digital Health. 2024 Feb 1;6(2):e126-30.
  - **Weng WH**, Baur S, Daswani M, Chen C, Harrell L, Kakarmath S, Jabara M, Behsaz B, McLean CY, Matias Y, Corrado GS, et al. Predicting cardiovascular disease risk using photoplethysmography and deep learning. PLOS Global Public Health. 2024 Jun 4;4(6):e0003204.
  - Xu S, Yang L, Kelly C, Sieniek M, Kohlberger T, Ma M, **Weng WH**, Kiraly A, Kazemzadeh S, Melamed Z, Park J, et al. ELIXR: Towards a general purpose x-ray artificial intelligence system through alignment of large language models and radiology vision encoders. arXiv preprint arXiv:2308.01317. 2023 Aug 2.
  - Baur S, Nabulsi Z, **Weng WH**, Garrison J, Blankemeier L, Fishman S, Chen C, Kakarmath S, Maimbolwa M, Sanjase N, Shuma B, et al. HeAR—Health Acoustic Representations. arXiv preprint arXiv:2403.02522. 2024 Mar 4.
  - Blankemeier L, Baur S, **Weng WH**, Garrison J, Matias Y, Prabhakara S, Ardila D, Nabulsi Z. Optimizing Audio Augmentations for Contrastive Learning of Health-Related Acoustic Signals. arXiv preprint arXiv:2309.05843. 2023 Sep 11.
- Collaborations
  - Srinivas AA, Oikarinen T, Srivastava D, **Weng WH**, Weng TW. SAND: Enhancing Open-Set Neuron Descriptions through Spatial Awareness. 2025 WACV.
  - Blankemeier L, Cohen JP, Kumar A, Van Veen D, Gardezi SJ, Paschali M, Chen Z, Delbrouck JB, Reis E, Truyts C, Bluethgen C, et al. Merlin: A vision language foundation model for 3d computed tomography. Research Square. 2024 Jun 28:rs-3. Submitted to journal.
  - Yadkori YA, Kuzborskij I, Stutz D, György A, Fisch A, Doucet A, Beloshapka I, **Weng WH**, Yang YY, Szepesvári C, Cemgil AT, Tomasev N Mitigating LLM hallucinations via conformal abstention. NeurIPS 2024 Statistical Foundations of LLMs and Foundation Models Workshop.