

Ryan Wang

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Education

University of Massachusetts Amherst

M.S./Ph.D. in Computer Science

GPA: 3.79/4

Amherst, MA, USA

M.S. Expected 06/2026

Ph.D. Expected 06/2028

National Tsing Hua University

B.S. in Computer Science

GPA: 3.99/4.3

Hsinchu, Taiwan

06/2022

Research Summary

Ph.D. student specializing in Machine Learning for Digital Health, focused on developing and validating wearable-based biomarkers and prediction models to improve clinical outcomes in stroke rehabilitation and enable cost-effective monitoring tools.

Experience

Research assistant

University of Massachusetts Amherst, Advanced Human Health Analytics Lab., Advised by Prof. Sunghoon Ivan Lee

Amherst, MA, USA

09/2023 - Present

- Developed a wearable-based digital biomarker for monitoring upper-limb stroke recovery, enabling a 60% reduction in required clinical trial sample size and supporting remote recovery monitoring. Manuscript under review at *Science Translational Medicine*.
- Applied ML models integrating baseline clinical and kinematic data to reduce 3-month outcome prediction error by 31-52%, enabling earlier identification of at-risk patients and personalized rehabilitation planning. Manuscript in preparation for *PLOS ONE*.
- Engineered a wrist-worn digital biomarker to quantify compensation movements; achieved a 0.67 Spearman's correlation with compensation scores, providing a validated metric for objective, long-term monitoring. Manuscript in preparation for *Neurorehabilitation and Neural Repair*.

Research mentor

University of Massachusetts Amherst

Amherst, MA, USA

06/2025 - 09/2025

- Supervised undergraduate research on predictive modeling of stroke risk using electronic health records (EHR).

Research assistant

National Tsing Hua University, Human-Centered Machine Intelligence Lab., Advised by Prof. Po-Chih Kuo

Hsinchu, Taiwan

09/2020-03/2023

- Demonstrated that deep learning models can infer demographic attributes from chest X-rays, identifying critical fairness risks in clinical AI. Published in *The Lancet Digital Health*.
- Proposed a novel image augmentation method that reduced error disparities across demographic groups from 22% to 5% in chest X-ray anomaly detection. Published in *eBiomedicine*.
- Developed a multimodal diagnostic model for COPD classification (AUC=0.76) using model-fusion ML techniques to integrate clinical data and chest X-ray. Published in *International Journal of Medical Informatics*.

Teaching assistant

University of Massachusetts Amherst

Amherst, MA, USA

01/2026 - 06/2026

- COMPSCI 160 Object-Oriented Programming: Hosted lab and review sections,

graded assignments, labs, and quizzes.

National Tsing Hua University

- Discrete Mathematics: Designed and graded assignments and exams.
- Introduction to Machine Learning: Designed assignments, labs, and exams.

Hsinchu, Taiwan

09/2020-02/2021

09/2021-02/2022

Awards

College Student Research Creative Awards Ministry of Science and Technology (MOST), Taiwan	06/2023
Undergraduate Research Fellowship Ministry of Science and Technology (MOST), Taiwan	09/2022
Second Runner-up SG Healthcare AI Datathon & EXPO	12/2021

Journal Publications

- [J4] **Wang, R.**, Lang, C. E., Stoykov, M. E., Bonato, P., & Lee, S. I. (2025). Wearable-based digital biomarker provides a valid alternative to traditional clinical measures for post-stroke upper-limb motor recovery. medRxiv, 2025-01. (Under reviewed at *Science Translational Medicine*)
- [J3] **Wang, R.**, Kuo, P. C., Chen, L. C., Seastedt, K. P., Gichoya, J. W., & Celi, L. A. (2024). Drop the shortcuts: image augmentation improves fairness and decreases AI detection of race and other demographics from medical images. *EBioMedicine*, 102.
- [J2] **Wang, R.**, Chen, L. C., Moukheiber, L., Seastedt, K. P., Moukheiber, M., Moukheiber, D., ... & Celi, L. A. (2023). Enabling chronic obstructive pulmonary disease diagnosis through chest X-rays: A multi-site and multi-modality study. *International Journal of Medical Informatics*, 178, 105211.
- [J1] Gichoya, J. W., Banerjee, I., Bhimireddy, A. R., Burns, J. L., Celi, L. A., Chen, L. C., ... **Wang, R.**, ... & Zhang, H. (in alphabetical order) (2022). AI recognition of patient race in medical imaging: a modelling study. *The Lancet Digital Health*, 4(6), e406-e414.

Conference / Workshop Publications

- [W1] **Wang, R.**, Chen, L.C., Lin, P.C., Wawira, J., Celi, L., & Kuo, P.C. (2022). Eliminating race-related shortcuts in deep neural networks for chest X-ray analysis. *AAAI 2022 Workshop: Trustworthy AI for Healthcare*.

Service

Peer Reviewer: ICLR 2026 Workshop DATA-FM	02/2026
Peer Reviewer: EMBC 2026 - Abstracts	03/2026

Skills

Programming: C++, Python (NumPy, SciPy, PyTorch, TensorFlow, scikit-learn, Matplotlib), Git

Research: Machine/Deep Learning, Digital Health, Signal Processing, Statistical Analysis

Business (NSF I-Corps): Customer discovery, Market analysis, Business model design

Languages: English (fluent), Mandarin Chinese (native)