

Ya-Wen (Yama) Chang

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I am a PhD researcher developing AI-driven systems for real-time mental health support, with a focus on agentic LLM systems, just-in-time adaptive interventions (JITAI), and multimodal behavioral sensing. My interdisciplinary background in clinical psychology, computational methods, and data science shapes how I design technology-guided mental health systems.

Technical Skills

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| Languages | Python (primary), R, JavaScript, SQL |
| ML & AI | TensorFlow/Keras, Scikit-learn, LLM prompt engineering, vLLM, multi-agent systems, time-series modeling |
| Health & Sensing | EEG/IMU signal processing, multimodal sensing pipelines (GPS, accelerometer, screen), BLE wearable interfacing, spectral analysis |
| Tools & Infra | Git/GitHub, multi-GPU serving, async processing, Jupyter, Chart.js, Leaflet.js |

Technical Projects

Dartmouth College • Center for Technology and Behavioral Health • github.com/yamachang

Neuro-Symbolic Sensor-to-Intervention Pipeline — *Generative AI System for Wellbeing*

Designed and built a hybrid neuro-symbolic architecture to solve a key limitation in LLM-driven interventions: LLM tokenizers cannot natively process numerical sensor time-series (the modality gap), leading to hallucinated clinical reasoning. Developed a semantic tokenization pipeline that translates raw multimodal sensor streams into human-readable behavioral tokens, enabling LLM abductive reasoning over 24-hour context windows. Scaled to **287K+ decision windows across 49 users** on a 4-GPU vLLM cluster.

LLM Decision Engine Evaluation — *Evergreen Platform*

Designed an evaluation framework for assessing LLM-based JITAI decision reliability across 287K aligned decision-window pairs and 49 users, with multi-level agreement metrics and permutation baselines. Demonstrated **topic agreement 71%**, personalization cosine similarity **0.905**, and agreement **31 σ above chance**. Built a 6-dimension automated evaluation suite.

NeuroZen: Real-Time Closed-Loop EEG Meditation System — *Course Project, Applied AI for Wearable Neurotech (Prof. Tam Vu) | GitHub*

Built an end-to-end closed-loop EEG meditation system in 10 weeks, from data collection to deployment. Designed a real-time pipeline that streams EEG/IMU data via BLE, processes biosignals, and classifies three meditation states (rest/light/deep) using LSTM models with **67% accuracy**—a novel task with no standardized ground truth. System delivers adaptive audio feedback with **latency under 520 ms** and includes a live visualization dashboard. IRB-approved 6-session crossover protocol.

Work Experience

PhD Researcher | *Dartmouth College, AIM HIGH Lab* Sep. 2024 – Present

LLM-based multi-agent pipelines for just-in-time adaptive interventions using multimodal behavioral sensing and conversational AI

Data Scientist | *Northwestern University, Lab for Scalable Mental Health* Sep. 2022 – Aug. 2024

ML models and statistical analyses on large-scale digital health datasets (600K+ records); county-level structural stigma index

Senior Research / Data Analyst | *University of Pittsburgh School of Medicine* Sep. 2020 – Aug. 2022

End-to-end research with classification models in R; automated reporting that reduced study enrollment gender gap to 8%

Research Intern | *Columbia University Irving Medical Center* Sep. 2018 – Mar. 2020

Independent mixed-methods research on LGBTQ+ mental health; first-authored publication and qualitative analysis

Education

Ph.D., Quantitative Biomedical Science — Dartmouth College, Geisel School of Medicine 2024 –

M.A., Clinical Psychology (Quantitative Methods track) — Columbia University, GPA: 4.0/4.0 2018 – 2020

B.A., Economics — National Taiwan University 2008 – 2012

Selected Publications

Chang, Y., Han, H.J., Griffin, T.Z., et al. (In Prep). Reliability of an agentic LLM JITAI engine for evidence-based interventions from passive sensing.

Chang, Y., Heinz, M.V., Griffin, T.Z., et al. (In Prep). The digital balance: Using passive sensing of online and in-person social behavior to model daily depressive symptoms.

Chang, Y., Sotomayor, I., Szkody, E., Fox, K., & Schleider, J. (2025). Effectiveness of an online single-session minority stress intervention. *SSM-Mental Health*, 100409.