

Hongzhou Luan

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RESEARCH INTERESTS

I work on maximizing AI's impact on healthcare for the underprivileged majority. A key barrier to clinical AI deployment is the statistically challenging, yet informative not-at-random missingness in healthcare data: the patterns that are often discarded but contain valuable signals about patient behavior and access. My research develops methods to both appropriately mitigate missingness and extract insights from the missingness itself. More broadly, I work to ensure people benefit from safe AI by covering the full range from bias analysis in clinical algorithms to AI governance and policy.

EDUCATION

UC Berkeley – UCSF	2023-
PhD Computational Precision Health	
Primary Advisor: Prof. Ida Sim	
Funding: JupyterHealth Fellowship	
University of Oxford	2018-2022
MEng Engineering Science	

PUBLICATIONS

- Zink, Anna, **Hongzhou Luan**, and Irene Y. Chen. "Access to care improves EHR reliability and clinical risk prediction model performance" *Nature Health* 2025 (In Press)
- Hugo Campos Jr, Daniel Wolfe, **Hongzhou Luan**, Ida Sim. "Generative AI as Third Agent: LLMs and the Transformation of the Clinician-Patient Relationship" *Journal of Participatory Medicine* 2025
- Zink, Anna, **Hongzhou Luan**, and Irene Y. Chen. "Access to care improves EHR reliability and clinical risk prediction model performance." *ML4H* 2024

AWARDS

Jardine Scholar	2018 - 2022
Full scholarship for the duration of four years at Oxford sponsored by the Jardine Foundation with an additional annual stipend of £10,300. Awarded to exceptional students from Asia demonstrating academic excellence and leadership potential.	

CURRENT PROJECTS

Wearable Data Missingness and Acute Event Prediction	2025 - Present
Advisors: Prof. Jessilyn Dunn (Duke University), Prof. Ida Sim	

- Analyzing 50,000+ participants with Fitbit data linked to EHR in the All of Us dataset to investigate whether shifts in wearable data missingness patterns precede acute cardiovascular events.
- Developing early warning methods that leverage routinely collected wearable data without requiring continuous wear compliance.

Missingness-Avoidant Neural Networks for Tabular Data	2025 - Present
Advisor: Prof. Fredrik Johansson (Chalmers University of Technology)	

- Designing attention-based architectures that make predictions using only observed features, eliminating reliance on imputation which assumes missing-at-random data and lacks clinical interpretability.
- Addressing a fundamental limitation: most healthcare missingness is informative and not-at-random, yet standard imputation methods obscure this signal and erode clinician trust.
- Enabling models that clinicians can trust by grounding predictions in actually measured values rather than statistically fabricated inputs.

AI Scribes Evaluation in Clinical Practice	2025 - Present
Advisors: Prof. Ahmed Alaa, Prof. Ida Sim, Prof. Paul Tang (Stanford)	

- Leading the **first systematic evaluation** of AI medical scribes at UCSF, analyzing 400 clinical encounters including raw audio, AI-generated notes, and physician-edited final notes.
- Identifying common AI errors including hallucinations, omissions, and unlicensed statements, and determining their potential to cause patient harm.

- Investigating how clinician editing behaviors vary by user experience and clinical context to inform safe deployment guidelines.

AI Policy Research and Legislative Drafting

2025 - Present

UC Berkeley CITRIS Policy Lab CITED

- Drafting AI governance legislation for the California Initiative for Technology and Democracy (CITED) to be presented to California bill authors.

Dermatology Triage for Skin Cancer Screening

Advisors: Prof. Katrina Abuabara, Prof. Meghan Shan

2024 - Present

- Developing a novel triage algorithm using **58,000+ patient-uploaded facial images** linked to demographic and clinical data, the **first extraction of such data from UCSF**. Independently filed the successful IRB for this project.
- Addressing a critical access gap: Medicaid patients wait over twice as long for dermatology appointments, and the US Preventive Services Task Force has repeatedly found insufficient evidence to guide skin cancer screening. Our approach identifies patients most likely to benefit from limited dermatologist availability.
- Departing from traditional melanoma AI that requires high-quality dermoscopic images—instead leveraging noisy, real-world images already captured in clinical workflows.

PREVIOUS RESEARCH EXPERIENCE

PhD Rotation

2023

Cancer Survival Rate Prediction Using Deep Learning Models

Advisor: Prof. Adam Yala

- Investigated factors affecting survival prediction performance in pretrained imaging models using mammography and CT data.
- Developed deep learning models for survival rate prediction in breast and lung cancer.

Master's Project

2021 - 2022

Algorithms for Epilepsy Diagnosis in Low- and Middle Income Countries Supervisors: Professor Timothy Denison and Dr Tingting Zhu, IBME Center, University of Oxford

- Developed a seizure prognostic device using inter-ictal EEG channel data for low-cost epilepsy diagnostic device, **tested in clinical settings in Kenya**.
- Funding source: **Wellcome Trust**

Bachelor's Group Project

2020 - 2021

Closed-loop Controlled Anaesthesia System

University of Oxford

- Led a team of four to develop a closed-loop anaesthesia control system using BIS index derived from EEG signals.
- Built a pharmacokinetic-pharmacodynamic simulation in Simulink modeling patient response to anaesthetics; validated with human data.

MENTORSHIP & SERVICE

Volunteer Graduate & Undergraduate Admissions Counselor

2019 - Present

Provide ongoing mentorship for first-generation students and women in STEM navigating undergraduate and graduate school applications. Mentees have been admitted to Stanford, University of Pennsylvania, Oxford, Cambridge, and other top institutions, with many receiving full scholarships.