

# Hongzhou Luan

Tel: +1 (510) 993 6534 ◊ Email: [hluan@berkeley.edu](mailto:hluan@berkeley.edu) ◊ LinkedIn: <https://www.linkedin.com/in/hongzhou-luan/>  
Website: [hongzhouluan.com/](http://hongzhouluan.com/) ◊ Github: [github.com/hzluan](https://github.com/hzluan)

## RESEARCH INTERESTS

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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

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**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

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- 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

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**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

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- 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**

2024 - Present

*Advisors: Prof. Katrina Abuabara, Prof. Meghan Shan*

- 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**

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### **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**

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### **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.