Yawen Guo

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Research Interests

I specialize in **evaluating healthcare AI and aligning them to human workflows, preference, and operational context**. I do this by combining qualitative inquiry with natural language processing (NLP), large language model (LLM) evaluation, and statistical analytics to examine how AI tools reshape clinical workflow, data quality, and downstream care outcomes. I aim to develop transparent and trustworthy AI systems that meaningfully support clinical practice.

AREAS: human-centered AI evaluation | EHR documentation and communication | natural language processing | large language models | clinical workflow and care outcomes

Education

University of California, Irvine (UCI) — **Irvine, CA, USA**
Ph.D. in Informatics — *09/2021 – present*

Carnegie Mellon University (CMU) — **Pittsburgh, PA, USA**
MISM - Business Intelligence and Data Analytics — *08/2019 – 12/2020*

Beihang University (BUAA) — **Beijing, China**
B.E. in Industrial Engineering & B.S. in Mathematics — *09/2015 - 07/2019*

Awards & Honors

Second Place, Student Paper Competition — AMIA Annual Symposium, 2022
"*Public opinions toward COVID-19 vaccine mandates: a machine learning-based analysis of U.S. tweets.*"

Best Student Paper Finalist — AMIA Annual Symposium, 2024
"*An Interactive Web Application for School-Based Physical Fitness Testing in California: Geospatial Analysis and Custom Mapping.*"

Publications

Peer Reviewed Papers

[P24] **Guo Y**, et al. *From Conversation to Chart: An Analysis of Clinician Edits to Ambient AI Draft Notes.* J Am Med Inform Assoc. 2026. Under revision.

[P23] Hu D, Flores D, Flores L, Chein R, Lam K, Chow E, **Guo Y**, Tam S, Perret D, Pandita D, Zheng K. *Ambient AI Documentation in Mixed-Language Encounters: A Heuristic Evaluation of Spanish-English and Mandarin-English Conversations.* AMIA Annu Symp Proc. 2026. (forthcoming)

[P22] Zhou Y, **Guo Y**, Sutari S, Chow E, Tam S, Perret D, Pandita D, Sadigh G, McEligot AJ, Zheng K. *Understanding Stigmatizing Language in Clinical Documentation: A Paired Comparison of Ambient AI Drafts and Clinician Finalized Notes*. AMIA Annu Symp Proc. 2026. (forthcoming)

[P21] Zhou Y, **Guo Y**, Hu D, Sutari S, Chow E, Tam S, Perret D, Pandita D, Zheng K. *Clinician Modification of Hedging Language in Ambient AI Draft Notes: A Paired Comparative Study.* AMIA Annu Symp Proc. 2026. (forthcoming)

[P20] Cho HN, **Guo Y**, Sutari S, Chow E, Tam S, Perret D, Pandita D, Zheng K. *Consumer-to-Clinical Language Shifts in Ambient AI Draft Notes and Clinician-Finalized Documentation: A Multi-level Analysis*. AMIA Annu Symp Proc. 2026. (forthcoming)

[P19] **Guo Y**, et al. *Understanding Clinician Edits to Ambient AI Draft Notes: A Feasibility Analysis Using Large Language Models*. AMIA Annu Symp Proc. 2026. (forthcoming)

[P18] Tran BD, Hu D, Seungjun K, **Guo Y**, Mangu R, Reynolds TL, Lafata JE, Ming T, Zheng K. *Does Recording Hardware Matter for Clinical Speech Recognition? Evaluating ASR Performance Across Consumer Devices.* AMIA Annu Symp Proc. 2026. (forthcoming)

[P17] **Guo Y**, et al. *What Do Clinicians Edit in Ambient AI-Drafted Clinical Documentation? A Qualitative Content Analysis.* J Am Med Inform Assoc. 2026. DOI: 10.1093/jamia/ocag073

[P16] **Guo Y**, et al. *Clinicians' Rationale for Editing Ambient AI-Drafted Clinical Notes: Persistent Challenges and Implications for Improvement.* J Am Med Inform Assoc. 2026. DOI: 10.1093/jamia/ocag059

[P15] **Guo Y**, et al. *A Scoping Review of Studies on Secure Messaging through Patient Portals: Persistent Challenges and Potential Solutions.* npj Health Systems. 2026.

[P14] Kim S, Zhou Y, **Guo Y**, Xiao C, Zheng K. Applying Natural Language Processing and Large Language Models to Clinical Notes for Phenotyping and Diagnosing Rare Diseases: A Systematic Review. J Am Med Inform Assoc. 2026. DOI:

10.1093/jamia/ocag045
[P13] **Guo Y**, Wang J, Hu D, Tam S, Gilman C, Chow E, Perret D, Pandita D, Zheng K. *Evaluating Ambient AI Documentation: Effects on Work Efficiency, Documentation Burden, and Patient-Centered Care*. J Am Med Inform Assoc. 2025. DOI: 10.1093/jamia/ocaf180
[P12] Hu D, **Guo Y**, Zhou Y, Flores L, Zheng K. *A systematic review of early evidence on generative AI for drafting responses to patient messages*. npj Health Systems. 2025;2(1):27. doi.org/10.1038/s44401-025-00032-5
[P11] Hu D, **Guo Y**, Cho HN, Chow E, Mukamel DB, Sorkin D, Reikes A, Perret D, Pandita D, Zheng K. *When AI Writes Back: Ethical Considerations by Physicians on AI-Drafted Patient Message Replies*. AMIA Annu Symp Proc. 2025. PMID: 41726446
[P10] **Guo Y**, Hu D, Zhou Y, Lyu T, Zheng K. *Computational Use of Patient-Provider Secure Messaging Data to Achieve Better Clinical Efficiency and Quality of Communication: A Systematic Review*. AMIA Annu Symp Proc. 2025. PMID: 41726454
[P9] Zhou S, Xu Z, Zhang M, Xu C, **Guo Y**, Zhan Z, Ding S, Wang J, Xu K, Fang Y, Xia L, Yeung J, Zha D, Melton B, Lin M, Zhang R. *Large language models for disease diagnosis: A scoping review*. npj Artificial Intelligence. 2025. doi.org/10.1038/s44387-025-00011-z
[P8] Thompson HR, Ricks-Oddie JL, Schneider M, Day S, Argenio K, Konty K, Radom-Aizik S, **Guo Y**, Cooper DM. *Data missingness and equity implications in the nation's largest student fitness surveillance system: the New York City School Based Physical Fitness Testing Programs, 2006-2020*. Journal of School Health. doi.org/10.1111/josh.70021
[P7] **Guo Y**, Hu D, Wang J, Zheng K, Perret D, Pandita D, Tam S. *Ambient Listening in Clinical Practice: Evaluating EPIC Signal Data Before and After Implementation and Its Impact on Physician Workload*. In: Proceedings of the 20th World Congress on Health and Biomedical Informatics (MEDINFO '25). 2025. doi:10.3233/SHTI250921
[P6] **Guo Y**, Hu K, Hu D, Zheng K, Cooper D. *An Interactive Web Application for School-Based Physical Fitness Testing in California: Geospatial Analysis and Custom Mapping.* AMIA Annu Symp Proc. 2024. PMID: 40417571. ***Best Student Paper Finalist***
[P5] Zehrung R*, Hu D*, **Guo Y**, Zheng K, Chen Y. *Investigating the Effects of Housing Instability on Depression, Anxiety, and Mental Health Treatment in Childhood and Adolescence*. AMIA Annu Symp Proc. 2024. PMID: 40417547
[P4] **Guo Y**, Zehrung R, Genuario K, Lu X, Mei Q, Chen Y, Zheng K. *Perspectives on Privacy in the Post-Roe Era: A Mixed-Methods of Machine Learning and Qualitative Analyses of Tweets.* AMIA Annu Symp Proc. 2023. PMID: 38222378
[P3] **Guo Y**, Liu X, Susarla A, Padman R. *YouTube videos for public health literacy? A machine learning pipeline to curate Covid-19 videos*. In: Proceedings of the 19th World Congress on Health and Biomedical Informatics (MEDINFO '23). 2023. doi:10.3233/SHTI231067
[P2] **Guo Y**, Zhu J, Huang Y, He L, He C, Li C, Zheng K. *Public opinions toward COVID-19 vaccine mandates: a machine learning-based analysis of U.S. tweets*. AMIA Annu Symp Proc. 2022. PMID: 37128441. ***Second Place in Student Paper Competition.***
[P1] **Guo Y**, Liu X, Susarla A, Padman R. YouTube Video Analytics for Patient Engagement: Evidence from Colonoscopy Preparation Videos.Workshop on Information Technologies & Systems (WITS). 2020.

Abstracts and Presentations
[A10] Yang D, Bharani V, **Guo Y**, Nguyen T, Zhuo J, Patel M. Resident Workflow Reimagined: A Generative AI Driven Chatbot to Improve Clinical Operations and Trainee Efficiency. Oral presentation accepted to AMIA Amplify Informatics 2026
[A9] Patel M, Eguilos R, Tam S, Gilman C, Perret D, **Guo Y**, Hu D, Rudkin S. Easing the Burden: Comparative Pilot of Ambient Artificial Intelligence Technology at a Large Academic Health System. Abstract accepted to AMIA 2025 Clinical Informatics Conference
[A8] Hu D, **Guo Y**, Salehi S, Zheng K, Chow E. Ambient AI Scribes: Surveying and Quantifying Education and Care Quality Concerns. Abstract accepted to AMIA 2025 Clinical Informatics Conference
[A7] **Guo Y**, Li J, Yu Y, Gharacholou M, Li F, Tao C. Exploring the Roles of Social Determinants of Health (SDOH) in Prognosis Prediction for Patients on DAPT After Drug-Eluting Stent Implantation. Abstract accepted to American College of Cardiology(ACC) 2025
[A6] Yiu AJ, **Guo Y**, Walden A, Radom-Aizik S, Cooper DM. Improving school-based physical fitness testing: Real-world evidence through domain analysis modeling. Medicine & Science in Sports & Exercise. 2024.
[A5] **Guo Y**, Ng DQ, Agapito I, Zheng K, Chan A. Comparing Patient-Reported Outcomes with Clinical Documentation Employing Natural Language Processing among Cancer Patients. Poster accepted to International Pediatric and Lifespan Data Science Conference, 2024 May
[A4] **Guo Y**, Hu K, Yiu A, Stehli A, Berrocal V, Ehwerhemeupha L, Zheng K, Cooper D. Mapping Health Inequity: Real-World Longitudinal Analysis of California's School-Based Physical Fitness Testing Program (SB-PFT) & Social Determinants of Health. Clinical and Translational Science Awards(CTSA) Program Annual Meeting 2023
[A3] **Guo Y**, Yiu A, Zheng K, Cooper D. Uncovering Social Determinants of Health from School-Based Physical Fitness Testing Data: A Geospatial Analysis. AMIA Annu Symp Proc. 2023. (in press)

[A2] Yiu AJ*, **Guo Y***, Ehwerhemuepha L, Cooper D. Health Inequity Demonstrated through School-based Fitness Testing. Pediatric Academic Societies (PAS) Meeting 2023
[A1] **Guo Y**, Liu X, Susara A, Padman R. YouTube Video Analytics for COVID-19 Literacy. Poster accepted to AMIA Annu Symp Proc. 2021.

Research

Dissertation: Evaluating and Optimizing Ambient AI Clinical Documentation **Irvine, CA, USA**
Advisor: Kai Zheng, PhD *02/2025 – Present*
Led an end-to-end evaluation of AI documentation at UCI Health, partnering with clinicians, hospital leadership, and vendor teams to translate human-AI collaboration patterns into targeted optimization strategies.

- Proposed and designed evaluation metrics to align with user requirements for large-scale AI documentation deployment ~400 clinicians, translated user behavior into measurable quality signals and showcased to leadership.
- Applied mixed-effects models across 80K+ AI-drafted notes to analyze and quantify human-AI collaboration variation, identifying targets for specialty-aware customization and quality monitoring.
- Developed a few-shot Llama-3.2-3B pipeline with structured JSON outputs and evidence-span validation to detect clinical documentation edit/error modes across 80K+ AI-drafted notes, achieving 0.787 held-out F1 for multi-label detection and enabling scalable quality monitoring beyond manual review.
- Built a prompting Llama-3-8B edit-flagging pipeline with log-probability confidence, evidence spans, and threshold-based triage; partnered with clinicians and hospital administration to standardize human-in-the-loop evaluation of high-risk note revisions from 33 specialties and 400 clinicians.

Clinical GenAI Implementation Pilots and Quality Assessment, UCI Health **Orange, CA, USA**
Collaborator: Deepti Pandita, MD *11/2023 – 10/2025*

- Evaluated GenAI in-basket messaging tools using BLEU&ROUGE scores and experts-validated quality measurement rubrics, demonstrating a 15% improvement in communication effectiveness and 20% higher precision in AI responses compared to physician-written messages.
- Designed pre- and post-implementation surveys and revealed a 25% increase in user satisfaction.
- Designed and deployed a RAG-based clinical workflow QA chatbot with OpenAI GPT-4o for 200+ medical trainees, integrated user feedback and confidence scoring, and improved perceived satisfaction by 30%.

Mapping Health Disparities and SDOH of California School Age Children,UCI **Irvine, CA, USA**
Collaborator: Dan Cooper, Professor *07/2022 – 06/2025*

- Developed an interactive web map application using ArcGIS and Geoserver, hosted on AWS, to visualize 20 years of School-based Physical Fitness Testing (SB-PFT) result data across 8K+ schools and 1.5M+ students.
- Implemented interactive visualization and statistical analysis functions at both school and school district levels, enabling users to analyze trends and patterns effectively.
- Designed customizable mapping tools, allowing users to create personalized maps and empowering over 1,000 educators, policymakers, and researchers monthly data-driven insights.

Machine Learning Pipeline for Large-Scale Social Media Text Analysis, UCI **Irvine, CA, USA**
Supervisor: Kai Zheng, Professor *10/2021 – 03/2022*

- Developed a scalable pipeline on 3M+ tweets on COVID-19 vaccine mandates and the overturning of Roe v. Wade, achieved 81.8% accuracy in sentiment classification using LSTM and XGBoost.
- Identified evolving public opinion patterns using CorEx and LDA with Scikit-learn, revealing key themes like public distrust in institutions and health misinformation trends.

YouTube Video Analytics for Managing Health Literacy, CMU **Pittsburgh, PA, USA**
Instructor: Rema Padman, Professor *01/2020 –08/2021*

- Developed a BiLSTM + UMLS pipeline to classify quality metrics including understandability, and actionability across 2K+ COVID-19 videos, achieving 86% PEMAT-label accuracy and identifying three PCA-based engagement dimensions to guide public health content design.

Time Series Forecasting and Machine Learning Laboratory, BUAA **Beijing, China**
Advisor: Yanfei Kang, Associate Professor *06/2018 – 06/2019*

- Conducted a log transformation to the M3 data, with the objective of stabilizing the variance of the time series and deseasonalized the time series using STL decomposition.
- Extracted the respective features from a time series using the method proposed by Hyndman.
- Utilized the “Snob” clustering algorithm, a mixture model based on the Minimum Message Length concept to the extracted feature vector, to obtain the clusters; built a separate LSTM predictive model for each cluster.

Internships

Data Science Intern, Keck Medicine of USC **Los Angeles, CA, USA** *06/2025 - 09/2025*

Collaborated with senior data scientists, clinical informaticians, and transfer-center stakeholders to build predictive analytics tools that support hospital transfer prioritization and post-deployment monitoring.

- Built a PyTorch-based transfer prioritization pipeline using gradient-boosted trees and regularized regression to model length of stay, readmission, and mortality across 11.6K + transfer records, identifying high-risk patients and reducing estimated clinician review time by ~40%.
- Improved AUROC of risk prediction models by 5–10% over baseline logistic regression models using risk-score features, time-windowed EHR variables, stratified sampling, hyperparameter tuning.
- Designed a feature/distribution/prediction drift-monitoring pipeline across 18.9K structured + free-text transfer docs (KS/JS, outliers; TF-IDF + PCA embeddings) to inform post-deployment model monitoring, detecting post-COVID drift in ~30 key features and 12 monthly cohorts.

Bioinformatics Research Intern, Mayo Clinic **Jacksonville, FL, USA** *06/2024 - 09/2024*

Collaborated with physicians and research leadership to develop clinical risk prediction and social determinants of health extraction methods for cardiovascular care improvement.

- Built adverse-event risk models for 30K cardiovascular disease (CVD) patients, improving F1 over biomarker-only baselines by +3.0% for bleeding and +2.7% for ischemic events through clinical notes and social determinants of health (SDOH) integration to inform targeted social-risk intervention priorities.
- Developed a CVD-specific SDOH ontology using few-shot prompt engineering across 1.2K+ papers, 30K+ EHR notes, and surveys; improved extraction accuracy by ~10% over rule-based methods, enabling standardized SDOH retrieval and relation dataset construction.

Research Assistant, Tsinghua Cross-strait Research Institute **Beijing, China** *02/2018 - 08/2018*

- ***TCM-CDSS (Traditional Chinese Medicine-Clinical Decision Support System)***
  - Proposed to conduct tongue image segmentation firstly and then classification using FCN.
  - Used U-net structure to train models for segmenting tongue images from facial images.
- ***AI Database for the Innovations and News of AI***
  - Applied TF-IDF (Term Frequency Inverse Document Frequency) and SimHash into Word2Vec to uplift TextRank algorithm in order to train the automatic abstract extraction model.
- ***Development and Market Analysis of Digital Currency Trading Platform***
  - Converted millisecond market data of different digital currency into simulated transaction price and researched a stable distribution during a certain period.
  - Found the suitable time window length and time delay distribution of transaction data using Pandas.rolling.
  - Designed a calendar spread arbitrage strategy and counted rate of return for analysis.

Assistance in Grant Writing

Contributed to NIH R01 Proposal on School-Based Physical Fitness Testing **Irvine, CA, USA**

Principal Investigator: Dan Cooper, Professor *07/2023 – present*

- Documented project progress and research milestones; led large group discussions to align research aims and methodology.
- Supported the HL7 Domain Analysis Model (DAM) for SB-PFT by assisting in the creation of standardized data element tables, drafting story scenarios to represent real-world use cases, and preparing formal HL7 documentation for working group review.

Teaching Experience

Teaching Assistant, *INF 171: Introduction to Health Informatics*, UCI, 2021

- Led discussion sections, graded assignments, and supported student learning in health informatics concepts.

Guest Lecturer, *INF 171: Introduction to Health Informatics*, UCI, 2024, 2025

- Delivered lectures on Clinical AI Applications, introducing students to machine learning and natural language processing use cases in clinical settings.

Teaching Assistant, *INF 174: Health Data Analytics*, UCI, 2026

- Led discussion sections, graded assignments, and supported student learning in SQL labs.

Research Mentor, University of California, Irvine, 2021–present

- Jun Zhu (Undergraduate) – Co-author on [P2]. Now a PhD student at Michigan State University.
- Kaiyuan Hu (Undergraduate) – Co-author on [P6]. Currently a Master's student in Computer Science at UC San Diego.
- Jiayuan Wang (Undergraduate) – Co-author on [P13]. Now a PhD student at University of California, Los Angeles.
- Song Hee Seo (Undergraduate) – Contributed to literature review on patient portal communication. Currently a Research Analyst at Jellyfish (South Korea).
- Thuy Nguyen (Undergraduate) – Contributed to an AI chatbot development backend workflow design; currently enrolled

at UCI.
- Jiacheng Zhou(Master's, UCI Data Science) – Contributed to an AI chatbot development user interface design; currently enrolled at UCI.

Academic & Professional Service

Student Volunteer, *AMIA Annual Symposium*, 2022

Manuscript Reviewer

- Digital Health (SAGE), 2025
- Journal of Clinical and Translational Science (JCTS), 2024
- npj Health Systems, 2025
- AMIA Annual Symposium, 2021, 2023, 2024, 2025
- AMIA Informatics Summit, 2023
- IEEE International Conference on Healthcare Informatics (IEEEICHI), 2023