Junjie Luo

Biomedical Informatics & Data Science
School of Medicine
Johns Hopkins University

jluo41@jhu.edu
+1 240 524 3597
jjluo.com

EDUCATION

Ph.D.   Health Science Informatics, Biomedical Informatics & Data Science, Johns Hopkins School of Medicine, 2022-2026 (expected)

Ph.D.   Information Systems, R.H. Smith School of Business, University of Maryland, College Park, 2020-2022 (transferred)

M.S.   Data Science, School of Science and Engineering, The Chinese University of Hong Kong, Shenzhen, 2018-2020

B.B.A   Applied Economics, School of Management and Economics *summa cum laude*, The Chinese University of Hong Kong, Shenzhen, 2014-2018

RESEARCH INTERESTS

My research is focused on designing and developing healthcare AI using real-world data, with special emphasis on human factors and behaviors to enhance health and wellness.

Artificial Intelligence: natural language processing, LLM, human-centered AI, foundation large models for healthcare, reinforcement learning.

Healthcare: big data in healthcare, health IT, EHR, mobile health, causal models, multi-modal sensor data modeling.

Behavioral Economics: human behavior, behavioral bias, social disparities, and experimental economics.

WORKING PAPERS

2025   **Junjie Luo**, Ritu Agarwal, Guodong (Gordon) Gao. "From Testing to Learning: Transforming Experimental Data into Patient Messaging Design Using Agentic AI", working paper.

2025   **Junjie Luo**, Ritu Agarwal, Guodong (Gordon) Gao. "A Time-Event Foundation Model Integrating Sensors and Behaviors for Diabetes Management", working paper.

2025   **Junjie Luo**, Ritu Agarwal, Guodong (Gordon) Gao. "Physician Personality and Behavior: How LLM-Revealed Traits Shape Opioid Overprescriptions", working paper.

2025   **Junjie Luo**, Ritu Agarwal, Guodong (Gordon) Gao. "Masked Excellence: Rating Disparity Reversal Reveals Physician Evaluation Bias", working paper.

2025   **Junjie Luo**, Xuzhe Zhi, Rui Han, Abhimanyu Kumbara, Anand K. Iyer, Mansur E. Shomali, Ritu Agarwal, Guodong (Gordon) Gao. "FairGlucose: A Benchmark for Fair and Robust Forecasting of Continuous Glucose Monitoring Time-Series Data", under review at ***AAAI 2026***.

2025   Yihong Guo, **Junjie Luo**, Guodong (Gordon) Gao, Ritu Agarwal, Anqi Liu. "Group-Sensitive Offline Contextual Bandit", under review at ***AISTATS 2026***.

2025   **Junjie Luo**, Rui Han, Arshana Welivita, Zeleikun Di, Jingfu Wu, Xuzhe Zhi, Ritu Agarwal, Guodong (Gordon) Gao. "Mapping Patient-Perceived Physician Traits from Nationwide Online Reviews with LLMs", under review at ***NPJ Digital Medicine***, (2025).

2025   **Junjie Luo**, Di Hu, Rui Han, Diyang Lyu, Ritu Agarwal, Nestoras Mathioudakis, Jehan El-Bayoumi, Guodong (Gordon) Gao, Nawar Shara. "Risk Stratification at Prediabetes Onset and Association with Diabetes Outcomes Using EHR Data" minor revision at ***NPJ Metabolic Health and Disease***, (2025).

PUBLICATIONS

2025   **Junjie Luo**, Yihong Guo, Anqi Liu, Ritu Agarwal, Guodong (Gordon) Gao. "PAME-AI: Patient Messaging Creation and Optimization using Agentic AI" ***NeurIPS 2025 Workshop on GenAI for Health*** (2025).

2025   **Junjie Luo**, Abhimanyu Kumbara, Mansur Shomali, Rui Han, Anand Iyer, Grazia Aleppo, Ritu Agarwal, Guodong (Gordon) Gao. "A large sensor foundation model pretrained on continuous glucose monitor data for diabetes management" ***NPJ Health Systems***, 2(1):35 (2025).

2025   Mansur E. Shomali, **Junjie Luo**, Abhimanyu Kumbara, Anand K. Iyer, Guodong (Gordon) Gao. "Impact of Food on A Transformer Based Glucose Prediction Model to Predict Glucose Trajectories at Different Time Horizons" ***Machine Learning for Healthcare***. (2025).

2024   Mansur Shomali, **Junjie Luo**, Abhimanyu Kumbara, Anand Iyer, Guodong (Gordon) Gao. "CGM-GPT: A Transformer Based Glucose Prediction Model to Predict Glucose Trajectories at Different Time Horizons" ***Machine Learning for Healthcare***. (2024).

2022   Weiguang Wang, **Junjie Luo**, Michelle Dugas, Guodong (Gordon) Gao, Ritu Agarwal, Rachel Werner. "Recency in Online Physician Ratings" ***JAMA Internal Medicine***, 182(8):881-883 (2022).

2022   Jichao Sun, Yefeng Zheng, Wenhua Liang, Zifeng Yang, Zhiqi Zeng, Tiegang Li, **Junjie Luo,** Man Tat Alexander Ng, Jianxing He, Nanshan Zhong. "Quantifying the Effect of Public Activity Intervention Policies on COVID-19 Pandemic Containment Using Epidemiologic Data From 145 Countries" ***Value in Health***, 25(5):699-708 (2022).

2021   Ritu Agarwal, Michelle Dugas, Jui Ramaprasad, **Junjie Luo**, Gujie Li, and Guodong (Gordon) Gao. "Socioeconomic privilege and political ideology are associated with racial disparity in COVID-19 vaccination." ***Proceedings of the National Academy of Sciences*** 118, no. 33 (2021).

2021   **Junjie Luo**, Xi Chen, Jichao Sun, Yuejia Xiang, Ningyu Zhang and Xiang Wan. "Field Embedding: A Unified Grain Based Framework for Word Representation" ***North American Association for Computational Linguistics***, 1754-1762 (2021).

CONFERENCE PRESENTATIONS

2024.9   Mansur Shomali, **Junjie Luo**, Abhimanyu Kumbara, Anand Iyer, Guodong (Gordon) Gao. "Evaluating a state-of-the-art generative pre-trained transformer model to predict continuous glucose monitoring values at different time intervals". ***DIABETOLOGIA'2024***.

2024.5   **Junjie Luo**, Abhimanyu Kumbara, Anand Lyer, Mansur Shomali and Guodong (Gordon) Gao. "Using an Automated, Real-time Data Enabled Feature Engineering Process to Predict Future Weight Outcomes". ***Conference on Health IT and Analytics'2024***.

2023.7   **Junjie Luo**, Gordon Gao, Ritu Agarwal. "Assessing Dataset Quality to AI Bias and Healthcare

Disparity: A Study on EHR-Based Prediabetes to Diabetes Risk Prediction Models". ***INFORMS Healthcare'2023***.

2023.7 **Junjie Luo**, Mansur Shomali, Abhimanyu Kumbara, Anand Lyer, and Guodong (Gordon) Gao. "Using Early Engagement Data from a Digital Health to Predict Future Health Outcomes". ***INFORMS Healthcare'2023***.

2023.5 **Junjie Luo**, Aishwarya Shukla, Jie Mein Goh, Guodong (Gordon) Gao, Ritu Agarawl. "Relationships Between Patient Satisfaction and Physician Overprescription: Evidence from Online Reviews and CMS Claim Data". ***Production and Operations Management Society'2023***.

2023.5 **Junjie Luo**, Abhimanyu Kumbara, Anand Lyer, Mansur Shomali, and Guodong (Gordon) Gao. "Using Early Engagement and CGM Data from a Digital Health Solution to Predict Future Engagement Patterns". ***Conference on Health IT and Analytics'2023***.

2022.11 **Junjie Luo**, Casey Kindall, Sara-Laure Faraji, Guodong (Gordon) Gao, Ritu Agarawl, Sally Simpson. "Foretelling the Physician's Future: Healthcare Fraud Prediction with Behavioral Big Data". ***American Society of Criminology Annual Meeting'2022***.

2022.6 **Junjie Luo**, Guodong (Gordon) Gao, Ritu Agarwal, and Sally Simpson. ""Minority Report" Comes True: Using Behavioral Big Data to Predict Physician Fraud". ***Academy Health'2022***.

2022.4 **Junjie Luo**, Shiping Liu, Guodong (Gordon) Gao, Ritu Agarwal. "Racial Disparity in the Availability of Social Determinants of Health Information in EHR Data". ***Production and Operations Management Society'2022***.

2022.3 **Junjie Luo**, Guodong (Gordon) Gao, Ritu Agarwal, and Sally Simpson. ""Minority Report" Comes True: Using Behavioral Big Data to Predict Physician Fraud". ***Conference on Health IT and Analytics'2022***.

2021.6 **Junjie Luo**, Xi Chen, Jichao Sun, Yuejia Xiang, Ningyu Zhang and Xiang Wan. "Field Embedding: A Unified Grain Based Framework for Word Representation". ***North American Association for Computational Linguistics'2021***.

PATENTS

2025 **Junjie Luo**, Abhimanyu Kumbara, Anand Iyer, Mansur Shomali, Guodong (Gordon) Gao. "Systems and methods for metabolic outcome predictions" US Patent 12,293,841.

2025 Anand Iyer, Abhimanyu Kumbara, Mansur Shomali, **Junjie Luo**, Guodong (Gordon) Gao. "Systems and methods for continuous glucose monitoring outcome predictions" US Patent 12,283,381.

2023 Anand Iyer, Malinda Peeples, Mansur Shomali, Abhimanyu Kumbara, Michelle Dugas, Guodong (Gordon) Gao, **Junjie Luo**. "Systems and methods for score based clusters" US Patent App. 18/052,094.

GRANTS

2023-24 "A Double-Edged Sword? Examining the Relationship Between Patient Satisfaction and Physician Overprescription" PI: Gordon Gao, Co-PI: Ritu Agarwal, Research Lead: **Junjie Luo**. Hopkins Business of Health Initiative (HBHI) Grant, $25,000.

2025 "CGM- and Behavior-based Large Health Model for Just-in-Time Diabetes Management." PI:

TEACHING

Johns Hopkins University

2025 spring	AI Essentials for Business, **Lecturer & Content Co-designer**, 4.51/5, 47 students.
2024 fall	Clinical Data Analysis with Python, **Teaching Assistant**.
2024 fall	AI Essentials for Business, **AI tech lead**.
2024 spring	Big Data Machine Learning, **AI tech lead**.

University of Maryland, College Park

2021 summer	AI Leadership in Healthcare Exec Ed program, **Head of AI Specialists**.

The Chinese University of Hong Kong, Shenzhen

2017 spring	DMS2051: IT in Business Application, **Teaching Assistant**.

EMPLOYMENT EXPERIENCE

2020	Algorithm Engineer, Jarvis AI Lab, Healthcare Group, Tencent Ltd, Shenzhen, China
2017-20	Research Assistant, Shenzhen Research Institute of Big Data, Shenzhen, China
2017	Data Mining Engineer, Ping An of China, Ping An Technology Co. Ltd, Shenzhen, China
2016-17	Research Assistant, School of Management and Economics, CUHK, Shenzhen

INDUSTRY COLLABORATION

DrFirst Inc., WellDoc Inc., MedStar Health, Inovalon Inc., Johns Hopkins Hospital.

HONORS AND AWARDS

2020	R.H.Smith School Graduate Assistant Scholarship
2020	Academic Performance Scholarship
2018	Admission Scholarship for Masters Program
2015-18	Dean's List Honor
2016-17	Academic Performance Scholarship
2016-17	Undergraduate Research Award
2014	Admission Scholarship for Undergraduate Program

TOOLKITS DEVELOPED

health-ai-pipeline: The digital health AI pipeline toolkit. Conceptualizing human subjects as collections of time-stamped records with multi-modal values, this pipeline package transforms these records into AI datasets and trains various types of AI models. It is designed for both training and inference and used as the MLOps pipeline with our research partners for model deployments in real-world business platforms.

cctner: A model that automatically extracts body, symptom, disease, examination, and other clinical entities from Chinese clinical texts.

ATol: A website-based and AI-supported annotation tool for collaborative annotation.

nlptext: A toolkit for preprocessing large English and Chinese corpus data with annotation labels and linguistic field grain sequences.

SKILLS

Programming: Python, R, MATLAB, SQL, STATA, C/C++.

Analytics: PyTorch, Tensorflow, Speech Recognition, Natural Language Processing, Language Languge Model, Multi-Modal Sensor Modeling, Topic Modeling, Sentimental Analyisis, Stance Detection, Figma, Tableau, Web Scraping, Web Development.

MLOps: SageMaker, Databricks, Spark, Hive, Docker, Kubernetes, EC2.