



2024 Election for Board Director

Candidate: Yuan Luo

Professional Title & Affiliation

Chief AI Officer and Professor, Northwestern University Feinberg School of Medicine

Personal Statement / Short Biography

My passion and affinity for informatics and specifically for AMIA is fully spoken of by my over 18 years, dedicated commitment to AMIA since 2006 when I helped organize i2b2 challenges as part of the AMIA Annual Symposium. My academic successes, professional experiences, strategic thinking and executive leadership carved out my qualifications to serve AMIA at the next level. AMIA Board of Directors embodies a cross-generational diversity that is a key element to its continued success and growth. As a representative of fast-rising, younger-generation biomedical informaticians at the crossroads of AI and medicine, I bring a unique vision to the AMIA Board of Directors and I am a vibrant addition to AMIA leadership. I am committed to build collaborative AI for healthcare to advance informatics both for local institutions and for the entire informatics community. My services to AMIA exemplifies my efforts towards this vision. For example, I initiated and have maintained the Healthcare AI and Data Science Year in Reviews, presented annually at the AMIA Informatics Summit. I established a tradition of collaborating with a different colleague each year to co-author the review to ensures diverse perspectives. I have served as Vice Chair and General Chair for the AMIA Informatics Summit in 2023 and 2024, respectively, and spearheaded the creation of the Data Science/Artificial Intelligence track to promote AMIA's integration of AI advancements and invite participation from societies like IEEE, ACM, and AAAI. Continuing advancing informatics and AI methodology, I will also leverage my board experiences (e.g., Governing Body of the Chicago Chief Data & Analytics Officers Community) and my advisory experiences to both public sector (e.g., National Quality Forum's AI in Quality Measures Technical Expert Panel) and private sector (e.g., Walmart) to lead strategy development for AMIA's branding and growth in the era of AI and put strategies into action if I am elected to the Board of Directors.

My qualifications can be summarized from my Biography as follows:

Dr. Luo is Chief AI Officer at Clinical and Translational Sciences Institute (NUCATS) and Institute for AI in Medicine, and have been awarded Full Professor with Tenure at the Feinberg School of Medicine, Northwestern University. Globally recognized for his leadership and significant contributions to biomedical AI, Dr. Luo has been elected as Fellow of the International Academy of Health Sciences Informatics (IAHSI), Fellow of the American College of Medical Informatics (ACMI) and Fellow of the American Medical Informatics Association (AMIA).

A visionary leader in the field, Dr. Luo is at the forefront of building next-generation biomedical informatics and collaborative AI for healthcare. His exemplary leadership shapes strategies across

various levels, ranging from university settings to entire health systems to national research consortia. With a commitment to democratizing AI literacy, Dr. Luo has been featured in eminent venues such as The Economist, JAMA Network and Becker's Hospital Review to share unique visions on delivering data and AI strategies that power Research & Development and drive business value.

As a pioneer in the development of multi-modal AI and data science frameworks, Dr. Luo's work focuses on understanding complex diseases and informing targeted therapies. His research has been featured in leading journals, including JAMA, Nature Medicine, Nature Biotechnology, JAMIA, JBI etc. Dr. Luo has given numerous keynotes to both academia and industry and has chaired multiple conferences and workshops. With a publication record of over 190 peer-reviewed papers, Dr. Luo's work has been cited over 11,000 times (h-index 52 and i10-index 130) by scientists across more than 30 different countries and 25 research areas.

Dr. Luo has served multiple board and advisory roles, including as a Governing Body Member of the Chicago Chief Data & Analytics Officers Community and as an AI advisor to Walmart and on National Quality Forum's AI in Quality Measures Technical Expert Panel.

Please describe your leadership skills and experience, inside and outside of AMIA

I have demonstrated exemplary leadership skills and experience through my efforts in combining medical informatics research, education, and practice while boosting community engagement.

Locally at Northwestern University Feinberg School of Medicine, I leveraged my strengths in basic methodology and translational science research to quickly establish myself as a go-to person for machine learning and artificial intelligence. I have become a hub of AI expertise, fostering cross-disciplinary research with around 40 PI-level collaborators across specialties such as cardiology, oncology, surgery, critical care, pediatrics, internal medicine, and transplantation. My leadership skills were recognized through my role as Chief AI Officer for the Northwestern CTSA, leading to the establishment of the new Institute for Augmented Intelligence in Medicine, where I also serve as Chief AI Officer.

Nationally, I have led the cross-CTSA CRITICAL consortium as PI, creating a shared data, research, and education platform. The CRITICAL dataset includes diverse racial, ethnic, and geographic profiles with practice variations that have clinical impact. Our research program develops novel, interoperable informatics algorithms for deep phenotyping using structured EHR data and clinical notes. Our education program offers open-source repositories, tutorials, and course modules compliant with FAIR principles to support the next-generation medical informatics workforce. I also lead the Data Translational Center of the national HeartShare consortium as MPI, combining omics, deep phenotyping, and electronic health records to identify heart failure subtypes and treatment targets. My role involves advancing HeartShares AI/ML development to promote precision medicine approaches, aiming to reduce morbidity and mortality in heart failure patients.

Internationally, I have organized multiple conferences, workshops, and journal special issues. In 2019, I organized the first international shared-task challenge on clinical missing data imputation, attracting participants from Asia, Europe, and North America across academia and the technology,

insurance, and pharmaceutical industries. In 2020, I co-chaired the Data Analytics track of the IEEE International Conference on Healthcare Informatics. From 2021 to 2022, I co-led the Drug Safety theme issue on Role of Artificial Intelligence and Machine Learning in Pharmacovigilance, providing comprehensive global coverage on how emerging technologies can enhance the field of pharmacovigilance. This year, I co-led the Nature Digital Medicine special issue on AI Governance in Healthcare, which addresses critical governance, regulation, and compliance challenges associated with AI in healthcare, particularly with the advancements in generative AI and large language models (LLMs).

For AMIA, serving as Vice Chair and General Chair for the 2023 and 2024 AMIA Informatics Summit, respectively, I spearheaded the creation of the Data Science/Artificial Intelligence track to promote AMIA's integration of AI advancements and invite participation from societies like IEEE, ACM, and AAAI. I initiated and have maintained the Healthcare AI and Data Science Year in Reviews, presented annually at the AMIA Informatics Summit. To document yearly progress effectively, I established a tradition of collaborating with a different colleague each year to co-author the review. This approach ensures diverse perspectives, highlighting technical advancements, challenges, ethical considerations, and the broader impact on healthcare and biomedical research. By inviting contributions from various experts, my initiative fosters collaboration within the informatics community, encouraging idea exchange and promoting a comprehensive understanding of AI and Data Science's evolving influence on healthcare.

Committed to growing the next generation of informaticists, I have mentored over 60 individuals, half of whom are female, ranging from junior faculty and fellows to postdocs and students. I have helped over 10 assistant professors secure multiple R and K grants on applying AI/ML to clinical specialties and developed innovative educational approaches such as AI4H Clinics to cross-pollinate clinicians and AI scientists, fostering effective collaborations from idea inception to model development, deployment, and continuous monitoring.

My thought leadership shapes strategies across multiple levels, from university settings and entire health systems to national research consortia. I advise both public and private sectors, including the National Quality Forum's AI in Quality Measures Technical Expert Panel and Walmart. My expertise is sought after by prominent venues such as The Economist, JAMA Network, Beckers Hospital Review, and premier meetings and institutions. My influence extends to the broader data science and analytics community, evidenced by my invitation to join the Governing Body of the Chicago Chief Data & Analytics Officers Community, where I help shape priorities and steer the agenda for community growth.

Please describe your experience and accomplishments in informatics

I serve as the Chief AI Officer at the Clinical and Translational Sciences Institute (NUCATS) and the Institute for AI in Medicine, and an Associate Professor in the Department of Preventive Medicine at the Feinberg School of Medicine at Northwestern University. Recognized for my leadership and significant contributions to biomedical AI, I have been elected as a Fellow of the International Academy of Health Sciences Informatics (IAHSI), a Fellow of the American College of Medical Informatics (ACMI), and a Fellow of the American Medical Informatics Association (AMIA).

I am at the forefront of building next-generation biomedical informatics and collaborative AI for healthcare. My work helps shape strategies across various levels, ranging from university settings to entire health systems to national research consortia. I advise both public and private sectors, including the National Quality Forum's AI in Quality Measures Technical Expert Panel and Walmart. My expertise is sought at prominent venues such as The Economist, JAMA Network, Beckers Hospital Review, and premier meetings and institutions. My influence disseminates to the broader data science and analytics community and I was invited to join the Governing Body of the Chicago Chief Data & Analytics Officers Community to shape priorities and steer the agenda for community growth.

Pioneering the development of multi-modal AI and data science frameworks, my work focuses on understanding complex diseases and informing targeted therapies. My research has been featured in leading journals, including JAMA, Nature Medicine, Nature Biotechnology, JAMIA and JBI etc. I have given numerous keynotes to both academia and industry and have chaired multiple conferences and workshops. With a publication record of over 190 peer-reviewed papers, my work has been cited over 11,000 times (h-index 52 and i10-index 130) by scientists across more than 30 different countries and 25 research areas.

My work has led to the development of a seminal suite of AI methods, including generative AI and large language models (LLMs). These methods leverage multi-modal data, including multi-omics (e.g., single cell and spatial), medical imaging, structured clinical data, and unstructured biomedical narratives to better understand complex diseases and inform targeted therapeutics. As a passionate proponent of a paradigm shift from reactive to proactive AI/ML, my vision extends to leveraging the new paradigm to automate AI/ML continuous improvement and drive the model-design-experiment bench-bedside feedback loop. This vision guides the evolution of AI/ML solutions in complex territories such as drug discovery and highly dynamic situations in healthcare.

Share any unique skills or perspective you bring to this role

As a representative of fast-rising, younger-generation biomedical informaticians at the crossroads of AI and medicine, I bring a unique vision to the AMIA Board of Directors and I am a vibrant addition to AMIA leadership. I am committed to build collaborative AI for healthcare to advance informatics both for local institutions and for the entire informatics community. My services to AMIA exemplify my efforts towards this vision. For example, I initiated and have maintained the Healthcare AI and Data Science Year in Reviews, presented annually at the AMIA Informatics Summit. I established a tradition of collaborating with a different colleague each year to co-author the review to ensures diverse perspectives. I have served as Vice Chair and General Chair for the AMIA Informatics Summit in 2023 and 2024, respectively, and spearheaded the creation of the Data Science/Artificial Intelligence track to promote AMIA's integration of AI advancements and invite participation from societies like IEEE, ACM, and AAAI.

In addition to my work with AMIA, I serve as an AI/ML advisor to both the public sector, including the National Quality Forum's AI in Quality Measures Technical Expert Panel, and the private sector, such as Walmart, contributing to innovation across diverse domains. In my collaboration with the

American Heart Association, I developed fair and ethical AI models for predicting cardiovascular disease outcomes using their registry datasets. Our Circulation: Heart Failure paper in 2022 showed that by integrating social determinants of health and optimizing for both utilitarian and egalitarian objectives, it is possible to simultaneously enhance AI performance and reduce disparities across different racial groups.

I bring a unique perspective to the AMIA Board of Directors, combining my expertise in AI and data science with a strong commitment to diversity and inclusion. My lived experiences as an immigrant and my academic background across multiple countries provide me with a diverse and global perspective. I have worked extensively on integrating social determinants of health into AI models, striving to reduce disparities and promote equity in healthcare. My efforts to foster collaborations between diverse scientific societies and industries underscore my commitment to bridging gaps and fostering inclusivity within the field. These experiences and perspectives will contribute to the AMIA Board by promoting a more diverse, inclusive, and innovative approach to informatics and AI.

Please describe your teamwork experience and skills

I strive to be an effective team player in collaborative settings at various scales locally, nationally, and internationally. At Northwestern University Feinberg School of Medicine, I leverage my expertise in basic methodology and translational science to build collaborative AI for healthcare and support colleagues, making me the go-to person for machine learning and artificial intelligence.

Collaborative AI for healthcare unlocked and shaped real-world healthcare data for interoperable and self-service access, crafted multi-modal AI/ML tools and tutorials to enhance capabilities in analyzing complex healthcare data, and cultivated environments where clinicians and AI scientists can collaborate and innovate together. Through this initiative, I have enabled cross-disciplinary research with around 40 PI-level collaborators across specialties such as cardiology, oncology, surgery, critical care, pediatrics, internal medicine, and transplantation. Beyond leading major research grants, I frequently play a supportive role in helping collaborators secure their research grants, contributing my AI/ML expertise to over a dozen major research projects as a co-investigator.

On a national and international level, I actively contribute to multiple consortia, including eMERGE and 4CE. In these consortia, where I do not hold a leadership role, I am committed to ensuring the smooth operation of consortium activities at the Northwestern site. For example, my team has been responsible for many phenotyping validations at Northwestern for the eMERGE consortium since 2018. In the international 4CE consortium, my team maintains high-quality data curation and harmonization and actively contributes to writing analytics scripts for consortium-wide federated analysis, generating up-to-date insights from international COVID-19 patient profiles.

I also strive to nurture the growth of team players to maximize the positive impact of AI on healthcare. I launched the AI for Health (AI4H) clinic at Northwestern University in 2019. The clinic strengthens collaborations between clinicians and AI scientists by guiding multidisciplinary teams through each step: idea inception, model development, validation, deployment, and ongoing governance. AI4H has led to multiple system deployments in cardiology and pediatric critical care,

numerous publications, and successful NIH-funded awards across Northwestern and collaborating universities.

The AI4H clinic democratizes practical AI knowledge by accelerating clinicians' learning processes through collaboration with AI scientists. Conversely, clinicians provide critical clinical insights to guide AI model design, avoiding the pitfalls of misapplied models. The clinic primarily engages junior or training clinicians and AI scientists, fostering early exposure to AI in healthcare and building mutual trust and teamwork. This early co-development lays the foundation for career-long collaboration and effective team play.

Understanding the fiduciary duties of loyalty, care, and obedience, I am committed to working well with others as a member of a collaborative group with group decision-making authority. My experience and skills in teamwork, both inside and outside of AMIA, equip me to contribute effectively as a board member, promoting a culture of collaboration and mutual respect.

AMIA Engagement and Participation

AMIA member – 10-20 years

My AMIA engagement and participation started from 2006. To date, I have successfully mentored over 60 informatics team members, ranging from junior faculty, fellows, postdocs, and students to hospital analytics team members. Specific engagement and participation activities are as follows.

- 2023-2024, Chair for AMIA 2024 Informatics Summits
- 2024, Health Care AI and Data Science Year In Reviews at AMIA 2024 Informatics Summits
- 2023, Elected as Fellow of ACMI and Fellow of IAHSI
- 2023, Health Care AI and Data Science Year In Reviews at AMIA 2023 Informatics Summits
- 2022-2023, Vice Chair for AMIA 2023 Informatics Summits (Data Science and Artificial Intelligence track)
- 2022-present, inaugural Social Media Editor, JBI
- 2021, panelists, addressing machine learning bias panel in AMIA Annual Symposium 2021
- 2021, panelists, multi-modal data science for healthcare panel in AMIA Annual Symposium 2021
- 2019-present, Elected as Fellow of AMIA
- 2019-present, JBI editorial board member
- 2019/4, AMIA KDDM working group webinar on Missing Data Imputation in Longitudinal Multi-variable Clinical Data
- 2018-present, Journal of Healthcare Informatics Research Associate Editor
- 2018-present, PLOS One editorial board member
- 2018-present, JAMIA Open editorial board member
- 2018-2020, AMIA Membership and Outreach Committee Member
- 2018/12, Face of AMIA: [https://www.amia.org/about-amia/leadership/faces-of-amia/yuan-
luo-phd](https://www.amia.org/about-amia/leadership/faces-of-amia/yuan-luo-phd)
- 2018/11, AMIA 2018 NLP Doctoral Consortium Judge

- 2018/2, JAMIA journal club on Missing Data Imputation in Clinical Data
- 2017/11, Plenary presentation to AMIA Annual Symposium as inaugural AMIA Doctoral Dissertation Award Honorable Mention
- 2016-2017, Co-developed an automated AMIA submission and presentation matching and assignment system with Neil Sarkar's team at Brown. The system was later used in production mode for AMIA 2019 review
- 2016/11, Tutorial to AMIA 2016 Annual Symposium on Computational Phenotyping Methods
- 2016/11, Co-Chair for China-America Biomedical Informatics Summit colocated with AMIA 2016 Annual Symposium
- 2015-present, SPC members for AMIA Annual Symposium 2018, 2019, AMIA Joint Summits 2017
- 2020, AAAI 2019, IJCAI 2018, 2019, ACM BCB 2017, CIKM 2015 etc. See CV for more
- 2015 -present, AMIA NLP working group, AMIA KDDM working group members
- 2015/11, Invited presentation at AMIA Imaging Informatics Working Group
- 2014-2015, JAMIA student editorial board member
- 2014-present, Session chairs for AMIA Annual Symposia and Joint Summits
- 2013-present, In-person presentations at AMIA Annual Symposia and Joint Summits
- 2013/11, Presented to Natural Language Processing Doctoral Consortium and won first prize
- 2011-present, Reviewer for AMIA endorsed journals including JAMIA, JBI etc.
- 2010-present, Reviewer for AMIA Annual Symposia and AMIA Joint Summits

2006 -2007, Organizing team member of i2b2 shared task de-identification and smoking challenges at AMIA Annual Symposium (data annotation, preparation, submission evaluation and review, manuscript preparation etc.)

Areas of Expertise

Analytics; Big Data; Bioinformatics; Biostatistics; Cancer Research; Clinical Care; Clinical Decision Support; Clinical Research; Computer Science; Data Analysis; Data Mining ;Data Science; Education; Electronic Health Records; Ethics; Genomics ;Health Equity; Health Information Exchange; Imaging; Information Retrieval; Intensive Care; Interoperability; Knowledge Discovery; Knowledge Representation; Natural Language Processing; Neuroscience; Oncology; Ontologies; Open Source; Outcomes Research; Patient Centered Care; Pattern Recognition; Precision Medicine; Preventative Medicine; Privacy; Public Policy; Public/Population Health; Research; Simulation and Modeling; Telehealth; Translational Bioinformatics