

AI for Health: Leveraging Artificial Intelligence to Revolutionize Healthcare

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1. Introduction to the Workshop

Artificial Intelligence (AI) is poised to transform healthcare, offering groundbreaking capabilities in disease diagnosis, treatment, drug discovery, and patient care. By improving access to health services, reducing costs, and addressing workforce shortages, AI can play a pivotal role in tackling global health challenges. However, successfully integrating AI into healthcare requires careful consideration of regulatory frameworks, governance structures, data equity, and privacy protections. As interest in applying AI to healthcare grows, close collaboration between academia, clinical practitioners, and the healthcare industry becomes increasingly crucial to ensure that AI technologies are inclusive, equitable, and ethical. This workshop will bring together AI researchers, clinicians, and industry experts to foster dialogues and insights that contribute to responsible AI development. Focus areas will include AI for medical data analysis, clinical decision support systems, drug discovery, personalized medicine, and digital health platforms, all of which promise to reshape the future of health services.

2. Session Scope

This workshop will address critical challenges and solutions for advancing AI in healthcare. Traditional AI models in healthcare often rely on limited, isolated datasets, facing challenges like

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missing values, data imbalance, and insufficient representation of diverse patient populations. These issues can introduce algorithmic biases, impact generalizability, and reduce the accuracy of AI-driven predictions, especially in clinical settings. Ensuring access to large, high-quality datasets is key to addressing these limitations, yet privacy and security constraints often restrict data sharing and collaboration across institutions. By exploring both current and forward-looking perspectives, this workshop aims to inspire solutions that enhance AI's reliability, inclusivity, and ethical impact in healthcare. Furthermore, to encourage people to actively participate in sharing their health-related data, we need more accessible and user-friendly data management systems. Such systems should enable individuals of all backgrounds and income levels to contribute health-related data, including metrics from wearable technologies, supporting the development of comprehensive, personalized healthcare solutions. These systems should also provide intuitive interfaces for both patients and clinicians, allowing for easy interpretation of AI-generated insights with confidence. This workshop unites diverse stakeholders to drive scientific advances through cross-disciplinary collaboration, fostering people-centered, AI-enabled healthcare. Attendees will explore cutting-edge AI developments while emphasizing fairness, privacy, and transparency in global health. The workshop will feature experts from computer science, medicine, statistics, and AI to balance methodology presentations with interactive discussions, encouraging idea exchange and meaningful dialogue.

3. Organizing Team

Ruowang Li, Ph.D. is an Assistant Professor in the Department of Computational Biomedicine at Cedars Sinai Medical Center. His lab focuses on developing computational methods to extract knowledge from large-scale population-level data, such as biobank-linked electronic health record data. His area of research includes multi-omics data integration, federated learning of patients' data, genetic risk prediction, and genome-phenome associations.

Tiffani Bright, Ph.D. is an Assistant Professor of Computational Biomedicine at Cedars- Sinai and Co-Director of the Center for AI Research and Education. Her lab works to reduce bias in machine learning, ensuring clinical AI models treat all patients fairly. They enhance AutoML tools like TPOT to automate bias detection and mitigation, making fair model development more scalable. Instead of traditional proxies like race, they design predictive models based on fairer metrics to promote equitable healthcare outcomes.

Brian D. Davison, Ph.D. is a Professor and Chair of the Department of Computer Science and Engineering at Lehigh University. He is a co-founder of Lehigh's Center for Catastrophe Modeling, a founding co-director of the interdisciplinary Master's Program in Data Science and the founding director of Lehigh's undergraduate minor in data science. He serves as senior associate editor of the Association for Computing Machinery (ACM) journal Transactions on Intelligent Systems and Technology and associate editor for Frontiers in Big Data, Data Mining and Management Section. His research focuses on search, mining, recommendation, and classification problems in text and on the Web, as well as catastrophe modeling for natural disasters and health-related threats. Davison is an NSF Faculty Early CAREER award winner and his research has been supported by NSF, NIH, DARPA, Microsoft, Amazon, and Sun Microsystems.

Lifang He, Ph.D. is an Associate Professor in the Department of Computer Science and Engineering at Lehigh University, and the Chair of IEEE Computer Society Chapter at Lehigh Valley Section. She received her PhD degree in Computer Science and Postdoc training at UPenn and Cornell's medical schools. Dr. He has extensive expertise in developing advanced computational methods for biomedical research such as on understanding disease mechanisms, diagnosis, prognosis, disease biomarkers, and disease pathways. Her research span machine learning, computational medical imaging, AI for health, tensor computing, and multimodal analysis. She has published over 200 papers in peer-reviewed journals and conferences. Her work has been supported by NIH, NSF, ONR and DOE.