

KDD Health Day 2025

Harnessing AI Opportunities in Biomedicine and Healthcare

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Abstract

The ACM KDD 2025 Health Day theme, “Harnessing AI Opportunities in Biomedicine and Healthcare” highlights the transformative potential of AI-driven applications in healthcare, translational biomedical research, and basic biological research. This extended abstract discusses recent advancements, challenges, and future directions, focusing on integrating AI-ready data sets, interdisciplinary collaborations, and ethical AI practices. It aims to catalyze discussions on the potential of AI ecosystems in revolutionizing healthcare and related fields.

CCS Concepts

• **Information systems** → **Data mining**; • **Applied computing** → **Life and medical sciences**.

Keywords

AI Ecosystems, Data Harmonization, Knowledge Discovery, Healthcare Innovation, Ethical AI, Interdisciplinary Collaboration

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1 Introduction

Since 1995, the Association for Computing Machinery’s Knowledge Discovery and Data Mining (KDD) conference has been one of the foremost forums to highlight technological innovations and applications in knowledge discovery and data mining. In recent years, it has showcased artificial intelligence (AI) transformations across multiple sectors and domains in our society. This venue integrates the rapid developments in technological advancement with their applications in real-world settings and has been instrumental in the pioneering and implementation of AI-empowered technologies. As AI continues to drive transformation across industries, its role in biomedicine and healthcare has become increasingly critical. KDD Health Day serves as a dedicated forum to explore how AI-driven knowledge discovery can address some of the most pressing

challenges in medicine, from personalized treatment strategies to large-scale public health initiatives.

Global leaders from multiple disciplines, including government, industry, and academia, gather to address and learn about contemporary opportunities and challenges in the development of AI applications in the field of health; the dialogues are candid, and discussions vibrant. Over the years, KDD Health Day has explored various themes:

- 2018: Focus on the synergy between AI/ML communities and healthcare experts to foster innovations in bioinformatics and epidemiology.
- 2019: Discussion on how to extend healthcare beyond conventional settings, emphasizing telemedicine and precision health.
- 2020: Concentration on AI’s role in understanding and combating the COVID-19 pandemic.
- 2021: Highlighting the importance of explainability and trustworthiness in AI healthcare applications.
- 2022: Exploration of AI in disease diagnosis, vaccine distribution, and mobile health solutions.
- 2023: Examination of AI’s applications in clinical trials and the development of robust healthcare models.
- 2024: Building Health AI Ecosystem: “From Data Harmonization to Knowledge Discovery”.

2 Program Highlights

This year, the KDD Health Day will take place in Toronto, Canada, on Tuesday August 5th, 2025. The three co-chairs have carefully evaluated the landscape with respect to the state-of-the-art development in the fields; and have proposed a scientific program to facilitate the accomplishment of three scientific goals: **Goal 1**, supporting an AI-ready biomedical data ecosystem; **Goal 2**, engaging AI engineers and healthcare professionals to jointly develop domain-specific AI applications; in particular in the health-care domain, our program speakers are to address the challenges of accuracy, trustworthiness, and generalizability in AI model construction; and **Goal 3**, building computational infrastructure that enables rapid AI technology innovations and implementations for biomedicine and clinical applications. This year’s Health Day also aims to catalyze bold, forward-looking ideas that reimagine how AI can transform healthcare. We welcome provocative questions, interdisciplinary exploration, and paradigm-shifting perspectives that challenge the status quo.

To this end, we have invited government leaders, technology innovators, key project investigators, and committed AI educators to contribute to this program; we are proposing scientific sessions and panel discussions to highlight opportunities and brainstorm

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solutions to the challenges we face in biomedical AI. The organizers believe that open interdisciplinary dialogues among data science experts, AI engineers from computer science, and biomedical investigators will lead to robust partnerships between academia and industry. These alliances are essential for translating AI research into practical healthcare solutions. A healthy ecosystem of the major stakeholders and their cooperative relationships can help navigate challenges related to data privacy, model interpretability,

and the scalability of AI technologies, ensuring that AI innovations are effectively implemented in real world settings.

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