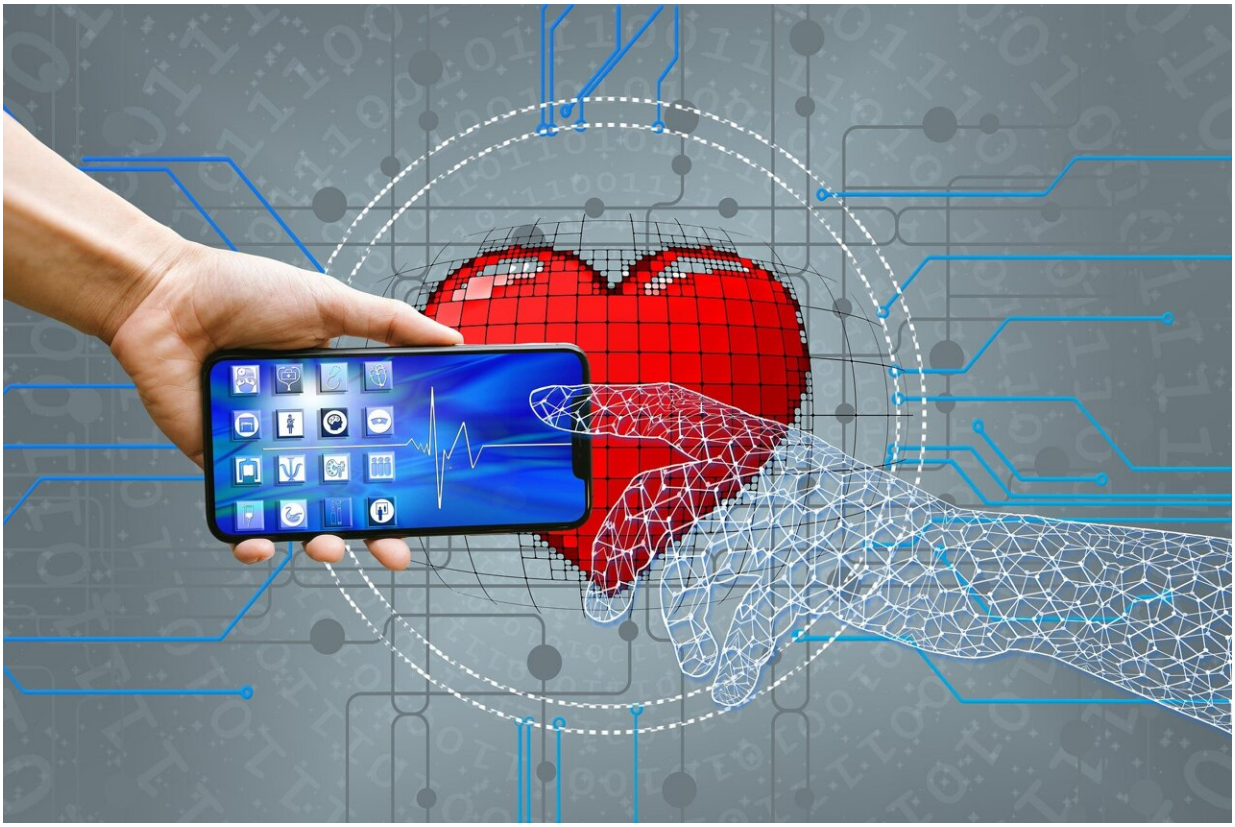
Q&A: How AI and machine learning can enhance social media as a public health tool

November 2 2023, by Erin Frick



Credit: Pixabay/CC0 Public Domain

Health organizations such as hospitals, medical clinics, pharmaceutical companies and community health centers are increasingly turning to social media to promote their brand and connect with patients by

delivering personally tailored content and expanded access to high-quality medical services. Embedding AI-driven tools such as telehealth services, chatbots and modes of remote diagnosis and patient monitoring into these platforms can allow health organizations to optimize their use of social media to improve patient care.

Ricky Leung, an associate professor of Health Policy, Management and Behavior at University at Albany's School of Public Health, studies health analytics, digital health and global health management. Leung recently published a paper in *Healthcare* that explores the ways artificial intelligence (AI) and machine learning (ML) capabilities can strengthen social media as public health tool.

The paper asks, "How can artificial intelligence and machine learning help health organizations make sense of large quantities of data collected through social media and put it to use to help patients, expand access to care, enhance equity in health care access and reduce health disparities?"

Here, Leung answers our questions about how applying AI-ML to health-related social media tools can improve content delivery, enhance patient privacy and data security, reduce misinformation spread and mitigate bias in AI-driven applications.

How is social media being used by health providers, doctors and patients?

Social media has transformed health care communication and information dissemination to the point where it is now integral in the field. Health providers use social media to share information, promote telehealth services and engage with patients for educational purposes. Doctors use it for professional development and networking, patient outreach and even monitoring the patient recovery process remotely.

Patients use social media to seek health advice and support through online communities. And now, AI is poised to bring new utility to these platforms.

For example, researchers are actively exploring the integration of ChatGPT and WhatsApp to provide mental health support. This could allow patients to get quick responses from an app that adopts such an integration. However, continuous evaluation is vital to maintain unbiased, updated information provided by the app.

How can AI-ML improve the ways health organizations and providers use social media to better serve patients?

While social media can host excellent resources and is easy to use, there are concerns about privacy, data security and misinformation. With enhanced capabilities to analyze vast amounts of data, AI-ML can more quickly identify and/or preempt data breaches to better protect patient data shared on social media. It can also help detect false information and get ahead of misinformation before it goes viral.

AI-ML can also be used to personalize health content for better patient engagement and education. This can support decision-making for patients and improve quality of care.

Additionally, giant tech companies such as Google and Amazon are developing AI systems designed to "learn" and offer empathy to patients. These developments hold promise in health care by providing personalized support, improving patient engagement and enhancing overall care experiences.

For health organizations looking to integrate AI-ML within their social

media platforms, it's important to start with a clear implementation plan, which I discuss in depth in my recent paper. This is vital to ensure smooth integration, maximize benefits and address potential challenges effectively.

How can AI reduce bias and improve equity within health technology systems?

A particular strength of AI-enabled health tools is the ability to personalize things like patient engagement and information delivery—which can support early disease detection and better care overall. However, it is important to ensure that AI algorithms are accurate and unbiased in order to promote health equity. This is something that I, along with other researchers in engineering and computing fields, are working on now.

Central to this work are what we call "composable systems." Most existing health technology systems are designed as a single unit and use "monolithic" architecture, which can be challenging to manipulate. Composable systems break down complex computational functions into smaller pieces, making it easier for health organizations to change discrete components within the system to tailor solutions for diverse user needs. This is particularly useful for low-resource settings where it simply isn't feasible to replace an entire system when new needs arise.

This is a promising research direction because composable systems can be developed to mitigate bias in the process of collecting the data used to train AI systems, and ultimately promote more equitable access to health care resources and services.

How can AI-ML help make social media platforms safer and more secure for patient use?

Online health care often involves the transfer of sensitive personal information, so data security is paramount. In order for AI-enabled social media tools to be effective, patients first need to feel comfortable providing private information within these platforms. This is where AI-ML can help, by strengthening privacy controls and assuring users that their health data is secure.

For example, composable systems and related technologies can be used to regulate the kind of information that is collected from users and how this information is applied. This can help prevent information overload (i.e., users getting spammed with too much or irrelevant content), and also tailor information collection levels according to users' comfort level. This combination can foster trust and encourage people to share health information online in a way that will better serve them.

Additional protective features enabled by AI-ML technologies involve advanced encryption and blockchain techniques that can detect and prevent data breaches—ensuring that patient information remains confidential while making social media a safer platform for sharing information that informs health care interactions.

What might you say to someone uncomfortable with the idea of AI 'robots' diagnosing humans or delivering care?

I am a tech enthusiast, and I have always been intrigued by the potential of technology to change health care for the better. AI sparked my interest as I saw accumulating evidence of its transformative potential in the field. There are many things that AI can do that humans cannot, such as analyzing vast amounts of data within seconds and doing repetitive and heavy-lifting tasks without ever being tired. Yet, I still think that human health care professionals are not replaceable (at least within the

foreseeable future). So, I am particularly interested in doing research to find out how humans and AI can collaborate to deliver more efficient, accessible and high-quality health services.

Importantly, we should remember that AI or robots are meant to work with human health care professionals—and augment their capabilities—not replace them entirely. These technologies are designed to assist with tasks that can be repetitive or data-intensive, allowing health care providers to focus more on patient care, empathy and complex decision-making.

Of course, as is the case with any new technology, concerns about misuse are real and valid. There will always be individuals who could abuse AI in any context. However, we are already seeing the implementation of applications similar to antivirus software, which are being developed to safeguard against such misuse.

For us as public health researchers, we can play a role in recommending regulatory and conceptual frameworks that promote responsible and beneficial AI usage, fostering its meaningful application in health care and beyond.

I am also pleased to see that scholars and academic institutions around the world are heavily investing in AI research and ethics education. At UAlbany, my courses this semester and in the Spring (HHPM 669 Topics in Health Policy & Management) focus on AI, machine learning, people analytics and ethics surrounding these topics. During my recent sabbatical, I taught classes and gave talks on AI and ethics at the National University of Singapore and the Chinese University of Hong Kong. These worldwide academic interests keep me optimistic about AI's future. I believe future generations will be well-informed about AI's capabilities and responsible use.

More information: Ricky Leung, Using AI–ML to Augment the Capabilities of Social Media for Telehealth and Remote Patient Monitoring, *Healthcare* (2023). DOI: 10.3390/healthcare11121704