High-Tech Medicine

Artificial intelligence can improve medical care, but can the health care industry guard against machines that may one day outsmart us?

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It's been almost 50 years since computers began being widely used as an administrative tool in health care, but it's only relatively recently that their artificial intelligence (AI) has been applied to patient care. How might this affect medical assistance for individuals?

Computer scientist Zeeshan Syed, PhD, the director of the clinical inference and algorithms program at Stanford Health Care defines artificial intelligence as, basically, getting computers to behave in smart ways by programming existing data into their systems. Ideally, AI could use this information to predict, prevent and treat disease. Innovative efforts to perfect these AI functions could help resolve current problems in medicine and help individuals reap huge benefits for better health and medical care overall.

"Algorithms and artificial intelligence are making it possible for doctors to rapidly apply relevant medical literature to their patients' cases, while 'natural language processing' (that is, talking to computers) holds the promise of liberating them from keyboards during office visits," writes cardiologist Eric Topol, MD, a professor of molecular medicine at The Scripps Research Institute, in an article for The Wall Street Journal.

Topol, a thought leader in individualized medicine, believes that AI will play an important role in keeping people healthy and out of hospitals. He sees a future in which sensors hooked up to smartphones and other wireless devices will allow people to track their vital signs and collect and transfer information to their doctors. This would permit physicians to diagnose and treat rapid-onset illnesses, injuries or chronic diseases that require constant monitoring.

In order to render computers capable of making such diagnoses, scientists employ a type of AI called "deep learning" that trains computers to evaluate information from medical records, sensors, images and language and make recommendations based on those evaluations. Experts believe artificial intelligence will enable machines to deliver more accurate disease diagnoses and develop better, more effective treatment plans for patients.

But some view the future of AI in digital medicine—and elsewhere—with fear. A key goal in the evolution of artificial intelligence is the development of programs that can resolve complex issues without human input. The ability of AI to think for itself in this manner is called "the singularity,"

the point when machines become smarter than humans. This situation worries British physicist Stephen Hawking and other experts on the technology.

Prime among the many causes for alarm is that AI could create a new, more dominant form of life that threatens humans. Artificial intelligence could become “extremely good at accomplishing its goals, and if those goals aren’t aligned with ours, we’re in trouble,” Hawking says.

To address possible problems ASAP, seven high-tech companies—Microsoft, Amazon, Apple, IBM, Google, DeepMind and Facebook—teamed up to form an oversight organization called the Partnership on AI to Benefit People and Society. Their stated goal is to promote ethical and technical standards for the development of artificial intelligence and to minimize any potential adverse consequences of the technology.

In medicine, poor decisions can lead to patients dying. This is why some experts say that human and artificial intelligence must be merged in a mindful and balanced way.
