Editorial

Artificial Intelligence In Healthcare

Khaleda Parvin Rekha

DOI: https://doi.org/10.3329/kyamcj.v11i4.51989

Artificial intelligence(AI), in a practical sense, refers to computer systems that simulate or exhibit a specific aspect of human intelligence or intelligent behaviour, such as learning, reasoning, and problem solving.[1] As such, AI is not a single technology but a range of intelligent processes and behaviours generated by computational models and algorithms. Recently, refined computational models and algorithms, coupled with powerful computers and the availability of massive data, have accelerated the advancements of AI, particularly in Machine Learning (ML), Natural Language Processing (NLP), AI voice technology, AI assistants and robotics. New powerful solutions have been developed to solve complex real-world problems in image understanding, speech recognition, big data analytics and healthcare. Artificial Intelligence (AI) is evolving rapidly in healthcare due to its potential to unlock the power of big data and gain insight for supporting evidence-based clinical decision-making and achieving value-based care.

Humans and machines each have their unique strengths and weaknesses and they can complement each other in providing and optimizing healthcare. The American Medical Association recently defined the role of AI in healthcare as "augmented intelligence," stating that AI will be designed and used to enhance human intelligence rather than replace it.[2]

The AI technologies can be used as powerful tools and partners to enhance, extend, and expand human capabilities, delivering the types of care patient's need, at the time and place they need them. It is important to indicate that a human-machine partnership by no means implies that the machine cannot be used alone. For tasks where a machine has surpassed human performance (eg, screening cancer, diabetic retinopathy and certain heart conditions), tasks where mistakes do not lead to serious consequences (eg, flagging an at-risk population group for vaccination), or for situations where human doctors are unavailable but a machine can do a good job (eg, using a chatbot to show a patient how to give an insulin injection), complete AI automation is possible. The key in human machine partnership is to keep the delicate balance between the types of care we value and the levels of automation that AI technologies offer.

The success of AI in healthcare can be attributed to the fast growing accessibility of healthcare data, combined with the quick development of analytic methods in big data. AI is capable of "learning" features from very large quantum of healthcare data, which it then uses to glean insights to be implemented in clinical practice. AI has the capacity to improve its accuracy by using feedback to learn and self correct. AI can harvest the latest medical knowledge from literature, thereby assisting in the endeavor to provide optimal patient care by assisting physicians. AI can help significantly in the reduction of human diagnostic and therapeutic errors. More specifically, at the stage of diagnosis, a significant amount of AI literature analyses data from electro-diagnosis, genetic testing and diagnosis imaging. In the analysis of diagnostic images that have substantial data information, radiologists have been advised to use AI technologies.[3]

AI literature in healthcare is mostly focused on heart disease, cancer and nervous system disease. A double blinded validation study has shown that the IBM Watson for oncology, which is an AI system, is reliable in providing assistance in diagnosing cancer.[4] In quadriplegic patients, the control of movement has been restored through an AI system.[5] The Arterys Cardio DL application uses AI to provide automated, editable ventricle segmentations based on conventional cardiac MRI images.[6] The focus on these three medical areas is to be expected. They are leading causes of death. Early diagnoses are critical to preventing or delaying disease associated mortality and morbidity. These medical areas are more amenable to early diagnoses by improvements in imaging, genetics and EMR, which are the strengths of the AI system. AI has also been used in the diagnosis of congenital cataract disease and diabetic retinopathy.[7]

The deployment of AI in healthcare comes with a number of risks. While focused, AI may be blind to wider context cues and it may also struggle to deal with the 'intrinsic uncertainty' of medicine in the real world. Additionally, reliance on automation may ultimately diminish the skills of physicians. There are some potential pitfalls of utilizing AI in healthcare, such as lack of compulsory ethical standards across the whole

sector, rushing the deployment of AI missing possible downsides, insufficient training of medical professionals, poor patient education and communication on benefits and disadvantages, unaffordable solutions fail to turn AI into the stethoscope of the 21st century.

AI augments the skills and expertise of medical staff by automating repetitive tasks, ensuring they are completed quickly and consistently. This will leave doctors and nurses free to spend more time with patients and to do the things that AI may not yet be able to do, such as tackling unexpected real-world problems.

References

1. Mc Carthy J. The Dartmouth summer research project on artificial intelligence. Artificial intelligence: past, present, and future. Available at: http:// www. dartmouth. edu/*vox/0607/0724/ai50.html. Accessed June 6, 2019.

2. The American Medical Association. AMA passes first policy recommendations on augmented intelligence. 2018. Available at: https://www.ama-assn.org/press-center/pressreleases/ama-passes-first-policy-recommendations-augmented-intelligence.Accessed July 1, 2019.

3. Pranav Veepanttu. The impact of artificial intelligence on healthcare. Available at: https:// www. researchgate. net/ publication/335620728

4. Somashekhar S, Kumarc R, Rauthan A, Arun K, Patil P, Ramya Y. Abstract S6-07:Double blinded validation study to assess performance of IBM artificial intelligence platform, Watson for oncology in comparison with Manipal multidisciplinary tumour board-First study of 638 breast cancer cases. Cancer Research.2017;77(4 Supplement):S6-07-S6-07.

5. Bouton C, Shaikhouni A, Annetta N, Bockbrader M, Friedenberg D, Nielson D et al. Restoring cortical control of functional movement in a human with quadriplegia. Nature. 2016; 533(7602):247-250.

6. Marr B. First FDA approval for clinical Cloud-Based Deep Learning in Healthcare. 2017. Availableat: https:// www. forbes.com/sites/bernardmarr/2017/01/20/first-fda-approval-for-clinical-cloud-based-deep-learning-in healthcare/#7a0ed8dc161c .Accessed 1 Jun 2017.

7. Long E, Lin H, Liu Z, Wu X, Wang L, Jiang J et al. An artificial intelligence platform for the multihospital collaborative management of congenital cataracts. Nature Biomedical Engineering. 2017;1(2):0024.

Dr. Khaleda Parvin Rekha
Department of Radiology and Imaging
Member Editorial Board
KYAMCH Journal.