RESEARCH STUDY & ANALYSIS OF ARTIFICIAL INTELLIGENCE ON MEDICAL FIELD

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ABSTRACT

Artificial intelligence-enhanced computer systems are widely used in the medical sciences. Common applications include patient diagnosis, prescription transcribing, enhancing doctor-patient communication, remote patient treatment, and pharmaceutical discovery and development from start to finish. Even while computer systems usually complete tasks faster than people do, modern computer algorithms have recently reached accuracy levels in the field of medical sciences that are comparable to those of human experts. Others predict that it won't be long until humans are completely supplanted in some roles in the medical sciences. This paper's objectives are to analyze how artificial intelligence is changing medical science and to separate marketing hype from actual information.

Keyword : artificial intelligence, deep convolution, medical use, neural network.

INTRODUCTION

Artificial intelligence (AI) has significantly impacted various industries, including banking, education, supply chains, manufacturing, retail, and healthcare. AI has enabled innovative commercial breakthroughs in the technology sector, such as web search, content and product suggestions, targeted advertising, and driverless vehicles. AI systems benefit people daily, from spam-free emails to smart watches that differentiate between routine and aerobic activities.

These systems also influence our perception and interpretation of information. This article aims to present AI's applications in the medical sciences, focusing on past and present-day applications and showcasing companies currently using AI in the healthcare industry. The article emphasizes the importance of interdisciplinary collaboration in creating ethical, unbiased AI systems. The article highlights the critical importance of interdisciplinary collaboration in achieving ethical and unbiased AI solutions in various industries.

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WHAT IS AI?

Building intelligent machines that can carry out tasks that traditionally require human intelligence is the focus of the broad field of artificial intelligence (AI). Automated interfaces for speech recognition, decision-making, visual perception, and language translation are some applications of AI. AI is a multidisciplinary field of study.It is commonly acknowledged that American computer scientist John McCarthy ET AL. convened the Dartmouth Conference in 1956, which is when thephrase "artificial intelligence" was first used. Before then, Dietrich Prinz's chess-playing program and Alan Turing's Turing test, which served as a gaugeof machine intelligence, were examples of work in the field of artificial intelligence.The following pattern is characteristic of artificially intelligent medical systems. Such a system begins with a big amount of data and uses machine learning algorithms to analyze that data.
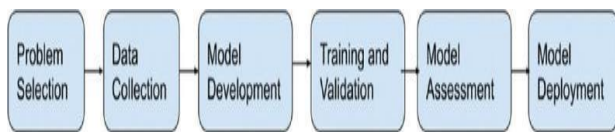
HISTORY OF AI IN MEDICAL FIELD

Artificially intelligent systems have made significant progress in patient diagnosis, particularly in visually oriented specialties like dermatology. Esteva *et al.*, (2017) developed a deep convolutional neural network (DCNN) model using 129,450 images to classify skin cancers into binary categories. The model achieved performance comparable to 21 board-certified dermatologists, and required less time to train than traditional medical school methods. Google also developed a DCNN for diabetic retinopathy and macular edema in adults.There areseveral advantages of the existence of such an artificially intelligent model, such as:

- ☐ Automated grading of diabetic retinopathy leading to increased efficiency indiagnosing many patients in shorter time;

- ☐ Serving as a second opinion opthalmologists;
- ☐ Detection of diabetic retinopathy in early stages due to capability of the model to study images at the granular level-something impossible for a human opthalmologist to do;
- ☐ Vast coverage of screening programs reducing barriers to access.

There have been significant advancements in the use of AI systems for medication discovery and offering individualized therapy alternatives. Companies like Verge Genomics concentrate on using machine-learning algorithms to evaluate human genomic data and find affordable treatments for neurological illnesses including Parkinson's, Alzheimer's, and amyotrophic lateral sclerosis (ALS).In the healthcare industry, artificial intelligence technologies are also being used to improve patient care, the patient experience, and offer assistance to doctors through the employment of AI assistants. Systems that can assist 24 hours a day with clinically relevant problems regarding:

- ➢ Instantly finding which physicians are on call and scheduling the next available appointment; the AI system can also search multiple scheduling systems across different hospitals
- ➢ Answering prescription related questions, like drug availability and cost-effective alternative drugs
- ➢ Assisting doctors search hospital protocol, list of available clinical tools, and available drugs all through the use of a mobile application, thus improving workflow in the hospit

PRESENT DAY USE OF AI

AI is being used in global healthcare to predict emerging hotspots during the COVID-19 pandemic. Google and Apple have partnered to create a contact tracing platform using AI systems on smartphones. The platform will allow users to report lab results and contact people near the infected person. Canadian company Blue Dot uses natural language processing, machine learning, and automated surveillance to predict future outbreaks. The company has published the first scientific paper on
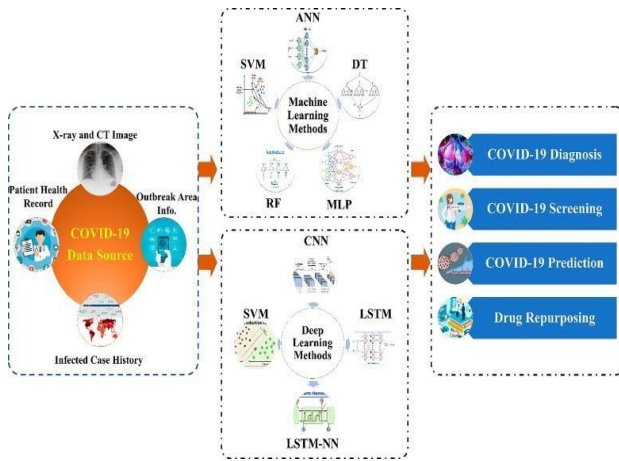
COVID-19.

MYTH VERSUS REALITY OF AI

AI has the potential to advance healthcare by improving patient diagnosis, prognosis, drug discovery, and providing personalized experiences. However, unrealistic expectations persist. Dr. Anthony Chang, a speaker at the Society for Artificial Intelligence in Medicine conference, discussed common misconceptions and future directions for AI in medicine, highlighting two common myths.

Clinicians will be replaced by AI:

While nobody can entirely predict the future, the fact is that physicians who understand the role of AI in healthcare will likely have an advantage in their career. For now, the need for human interaction in healthcare is likely to keep AI on the sidelines as a complement, rather than a substitute, for doctors. But perhaps in a few decades, patients will be comfortable interacting with computers and even trust them as their main source of medical guidance.

Programming knowledge is necessary to successfully use AI:

To create useful systems using AI in healthcare, doctors and data scientists must work together. While data scientists create AI systems, doctors must be aware of their capabilities and assess their significance. Collaboration also include identifying data sources for model training and performance evaluation. The procedure is made more challenging by the commoditization of AI tools, such as visual classifiers like Google's Teachable Machine.

Limitations and Challenges in Application of AI Systems in Medical Science

Artificially intelligent systems, particularly in healthcare, face limitations and challenges. Data collection is controversial due to patient privacy and data breaches. Advances in technology increase computational power, but data privacy concerns limit model potential. Biased models can be created, and understanding AI model construction is crucial. Fragmented data is another limitation, as models cannot be seamlessly transitioned between organizations. Privacy concerns and data sharing issues can also limit data sharing between healthcare organizations.


CONCLUSION

THE FUTURE OF AI IN MEDICAL SCIENCE

AI has the potential to revolutionize healthcare by freeing up doctors' time, organizing patient data, diagnosing patients, providing second opinions, and extending medical services to remote areas. However, its application in

general healthcare is relatively unexplored. The FDA approved AliveCor's Kardiaband and Apple's smartwatch series 4 for detecting atrial fibrillation, empowering people to collect personal health dataand enable rapid interventions. Research shows that people suffering from post-traumatic stress are more open to discussing concerns with virtual humans, potentially improving diagnosis and treatment. To make AI a reality, the healthcare industry needs to digitize medical records, standardize data infrastructure, and create an iron- clad system to protect confidentiality and patient consent.
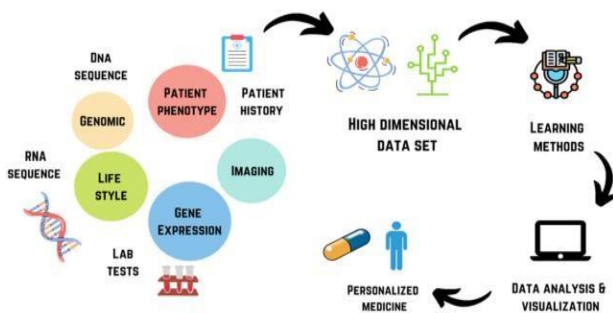
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