USING ARTIFICIAL INTELLIGENCE IN PUBLIC HEALTH

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https://doi.org/10.5281/zenodo.14756661

Abstract. Today, the introduction of artificial intelligence (AI) systems in medicine is one of the most important modern trends in global healthcare. AI technologies are fundamentally changing the global healthcare system, allowing for a complete redesign of the medical diagnostic system, the creation of new drugs, and a simultaneous reduction in costs for medical clinics. Equipped AI devices can extract valuable information from large volumes of data, offering ideas for use in various fields. Providing valuable information about treatment options: With the help of AI technologies, doctors can find information in the medical literature to support medical decision-making. Supporting user needs: thereby helping to increase user awareness by providing access to comprehensive information about the state of health. *Keywords:* Artificial intelligence, genomics, biotechnology, telemedicine, robotics, automation, nanotechnology, the future of AI in medical sciences.

ИСПОЛЬЗОВАНИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ОБЩЕСТВЕННОМ ЗДРАВООХРАНЕНИИ

Аннотация. Внедрение системы искусственного интеллекта (ИИ) в медицине сегодня является одним из важных современных трендов мирового здравоохранения.

Технологии СИ коренным образом изменят мировую систему здравоохранения, позволив полностью перестроить систему медицинской диагностики, создать новые лекарства и одновременно снизить затраты медицинских клиник. Оборудованные инструменты SI могут извлекать ценную информацию из больших объемов данных, предлагая идеи, которые можно применить в различных областях. Предоставление ценной информации о вариантах лечения. Благодаря технологиям SI врачи могут найти в медицинской литературе информацию, необходимую для принятия медицинских решений.

Поддержка потребностей пользователей: SI обеспечивает поиск и предоставление информации, тем самым помогая повысить осведомленность пользователей за счет доступа к комплексной медицинской информации.

Ключевые слова: Искусственный интеллект, геномика, биотехнологии, телемедицина, робототехника, автоматизация, нанотехнологии, будущее ИИ в медицине.

Introduction

Artificial intelligence computer systems are widely used in the medical sciences. Common applications include diagnosing patients, discovering and developing drugs, improving communication between doctors and patients, transcribing medical documents such as prescriptions, and treating patients remotely. While computer systems often perform tasks more efficiently than humans, recently state-of-the-art computer algorithms have achieved accuracy comparable to human experts in the medical sciences. Some believe that it is only a matter of time before humans are completely replaced in certain roles in the medical sciences. The purpose of this article is to discuss how artificial intelligence is changing the landscape of medical science and to separate the hype from the reality. These technologies help improve processes and reduce errors. All of these areas form the basis of modern medicine and aim to provide highly effective, integrative approaches to healthcare.

Literature Review and Method

AI is a broad branch of computer science that deals with the creation of intelligent machines capable of performing tasks that would normally require human intelligence. Some applications of AI include automated interfaces for visual perception, speech recognition, decision-making, and language translation. AI is an interdisciplinary field. The term AI was first coined in 1956 by American computer scientist John McCarthy et al. at the Dartmouth Conference. Prior to this, work in the field of artificial intelligence included the Turing test, proposed by Alan Turing as a measure of machine intelligence, and the chess-playing program written by Dietrich Prinz. Artificial intelligence systems in healthcare follow a typical pattern. Such a system starts with a large amount of data, uses machine learning algorithms to extract information from this data, and then uses this data to generate useful results to solve a well-defined problem in the healthcare system. Figure 1 illustrates a typical workflow of an AI solution. Applications of AI in the field of medical sciences include matching patient symptoms to the appropriate doctor, patient diagnosis, patient prognosis, drug discovery, bot assistants that can translate languages, transcribe notes, and organize images and files.

The use of AI can open up the following ways to bring additional innovations to medicine.

Creation of new and high-quality AI applications and platforms. These applications help provide highly efficient technologies for clinical diagnosis, treatment planning, and data analysis.

AI is used in all areas of medicine, such as radiology, pathology, cardiology, etc. New AI applications and applications are designed to be used in these areas, improving it technologically.

AI improves interactive communication with users and helps provide personalized training.

This makes it easier for medical professionals to learn and update the database. Artificial intelligence helps to continue the development of medicine and find solutions to problems in the field of medicine. This ensures more effective and better results in clinical diagnosis and treatment.

Biomedicine is a field that is associated with the application of biological tools and biotechnology to medicine to develop scientific, clinical and industry indicators. The first issues of biomedicine are genomics and genetics. In this field, it is important to support genetic data and genomic models, create personalized treatment plans, and create new therapeutic approaches based on genetic models.

Biomedicine deals with improving clinical diagnosis and prognostic plans based on biomarkers and biological signs in diagnostic processes.

This allows you to prevent the development of the disease, evaluate the results of treatment, and create personalized treatment plans.

Despite the above limitations, AI is well-positioned to revolutionize the healthcare industry. AI systems can help free up time for busy doctors by transcribing notes, entering and organizing patient information, and diagnosing patients, while also serving as a means of providing second opinions to doctors. Artificial intelligence systems can also help patients with follow-up care and the availability of alternative prescription drugs. AI also has the ability to diagnose patients remotely, thereby expanding healthcare services beyond the world's major urban centers.

The future of AI in healthcare is bright and promising, but much remains to be done. The negative impact of modern technology on mental health is numerous. However, researchers at the University of Southern California (USC), in collaboration with the Defense Advanced Research Projects Agency and the US Army, have found that people suffering from post-traumatic stress disorder and other forms of mental distress are more open about discussing their concerns with virtual people than with virtual people. Real people for fear of judgment. This study has promising results for the role of virtual assistants, which ultimately collect accurate responses from patients, which will help doctors diagnose and treat their patients correctly and be better informed. Given the impact that AI and machine learning will have on our wider world, it is crucial that AI is part of the curriculum for a range of domain experts. This is especially true for the medical profession, where the cost of a wrong decision can be fatal. As we will see here, there is a lot of nuance in how an AI system is built. Understanding this process and the choices that go along with it are important for the proper use of this automated system. The data used for learning and the optimization strategy will have a profound impact on the application of the AI system to a particular problem. Understanding and evaluating these design decisions is important for the medical profession. Artificial intelligence can help solve many of the biggest challenges in healthcare, but we are still a long way from making it a reality. The big challenge and obstacle to making it a reality is data. We can invent all the promising technologies and machine learning algorithms, but without sufficient and well-presented data, we will not be able to realize the full potential of AI in healthcare. The healthcare industry needs to digitize medical records, it needs to come together to agree on standardization of data infrastructure, it needs to create an iron-clad system to protect privacy and obtain informed consent from patients. Without this fundamental change and collaboration in healthcare, it is difficult to achieve the true promise of AI to help people's health.

Discussion

The main directions of modern medicine are currently the development of artificial intelligence and data analysis, which provide highly effective diagnosis and treatment in medicine.

Artificial intelligence algorithms help in reading clinical data, making diagnoses, and planning treatment.

• Clinical diagnosis and diagnostic assistance. Artificial intelligence makes diagnoses based on clinical images and data. For example, radiological images, tomography results, and MRI scans are analyzed by algorithms based on the data provided.

• Data analytics: Artificial intelligence performs data analysis in medicine based on clinical information, laboratory results, unchanging historical data, and other sources. This improves the analysis, prognosis, and treatment plans of diseases.

• Personalization and prognostics: Artificial intelligence helps in creating personalized treatment plans for each individual. Based on genomics and clinical data, artificial intelligence collects information that is tailored to the individual and shapes the treatment.

• Robotics and automation: In medicine, robots and automated devices are used in clinical operations and treatment processes. Artificial intelligence also plays an important role in optimizing clinical processes for robots.

Artificial intelligence improves consultations in telemedicine. It enables sharing and displaying information with experts in other regions or remote locations. The application of artificial intelligence in medicine makes medicine more efficient, better results are obtained, and helps create breakthrough technologies in the fight against diseases. Clinical imaging and diagnostics helps in analyzing radiological images (such as X-rays, MRIs, and CT scans) and identifying diseases. This speeds up radiological diagnosis in medicine and allows for more accurate diagnosis.

Artificial intelligence helps in medical analysis of genomic data and creating personalized treatment plans. This allows for the creation of individual therapy plans based on the genetic characteristics of each individual. Artificial intelligence helps in improving treatment plans based on clinical data and results. This is used to improve dosing plans and treatment protocols. Clinical latency optimization: Artificial intelligence helps in improving clinical processes and optimizing treatment processes. This helps in the best use of medical services and resources and improving clinical performance. Artificial intelligence is used to study the prognosis of diseases based on clinical data, laboratory results, unchanging historical data and other sources.

This helps to prevent the development of diseases and create personalized treatment plans.

The application of artificial intelligence in clinical practices, in creating treatment plans and in other areas of medicine, provides highly effective technologies for improving health and combating diseases.

Although artificial intelligence is important and useful in medicine, it also has several disadvantages. One of the most important disadvantages of artificial intelligence in medicine is the need for an accurate and complete data set. Sometimes the medical data set is not accurate and of high quality, which can affect the ability of artificial intelligence to obtain accurate and effective results. The provision of diagnostics and recommendations by artificial intelligence is of high importance in terms of privacy and information security. The protection and confidentiality of personal data are increasing. Artificial intelligence algorithms can be subject to change and errors.

Sometimes it is found that they can lead to misdiagnosis or errors in the creation of correct treatment plans. Artificial intelligence is used in medicine for consultations and diagnostic assistance, but this does not include management and understanding in communication with people, and it cannot express opinions freely like humans. The use of artificial intelligence in medicine raises legal and ethical issues. Along with these shortcomings, legal, information security, and anti-human concerns must be addressed for artificial intelligence to be integrated and used in medicine.

Results

The use of artificial intelligence (AI) technologies in medicine has grown significantly in recent years, leading to revolutionary changes in diagnostics, treatment and optimization of healthcare.

Diagnostics

• Medical image analysis: AI is used to analyze images such as X-rays, CT (computed tomography), MRI (magnetic resonance imaging) and ultrasound. This technology provides accurate and fast results in the detection of tumors, cardiovascular diseases and lung problems.

• Early disease detection: AI algorithms can help detect diseases at an early stage by studying symptoms, such as diabetes, cancer and Alzheimer's disease.

Personalized medicine

• AI helps develop individual treatment plans based on each patient's genetic information, medical history and lifestyle.

• In the process of drug synthesis, AI allows for the optimal dosage and drug selection for patients.

AI-powered assistants

• Virtual assistants and chatbots: Used to answer patients' simple questions, provide information about medications, and monitor their health. For example, virtual assistants can remind them to take their medications on time.

• Telemedicine: AI is essential for improving remote consultations.

Surgery and robotics

• AI-equipped surgical robots help surgeons perform delicate operations. For example, the da Vinci Surgical System performs minimally invasive surgeries with precision.

• AI is used to assess conditions in real time during surgery.

Healthcare management

• Analyzing large amounts of data to predict disease spread and manage epidemics.

• Automating patient monitoring and treatment processes.

Clinical trials and drug development

• AI helps speed up and reduce the cost of drug trials. AI is an effective tool in the process from preliminary tests to clinical trials.

• Analyzes all available research and data to develop new therapeutic methods.

Data Analytics

- Increases efficiency in the healthcare system by working with Big Data.
- Helps in making healthcare policies and decisions based on statistical data and analysis.

Benefits:

- Early detection and treatment of diseases.
- Improving the quality of medical services.
- Acceleration of diagnostic and treatment processes.
- Reducing the workload of medical personnel.

Risks and limitations:

- Data confidentiality and security.
- Possible errors due to incorrect operation of SI algorithms.
- Cost of technology and difficulties in its implementation.

Conclusion

Artificial intelligence (AI) technologies are revolutionizing modern medicine and playing an important role in maintaining and improving public health. This technology creates great opportunities for early detection of diseases, developing personalized treatment plans, automating medical processes, and effectively managing healthcare services. With the help of AI, the diagnostic process is accelerated and more accurate, as well as facilitating remote monitoring of patients and epidemic control. At the same time, AI allows reducing the workload of medical personnel and increasing the overall efficiency of the healthcare system. However, in order to fully utilize the technology, it is necessary to ensure data confidentiality, increase the reliability of AI algorithms, and solve the economic problems associated with its implementation. In the future, further development of AI technologies will undoubtedly bring public health and the quality of medical services to a new level. This opens up great opportunities for building a healthy society and ensuring global progress in healthcare.

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