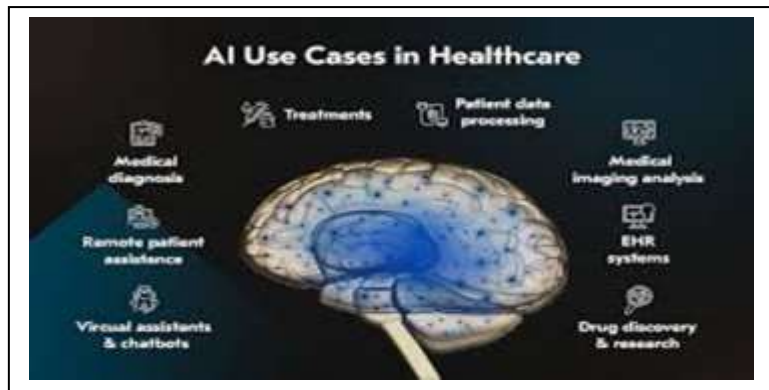


تطبيقات الذكاء الاصطناعي في مجال الطبي

يُستخدم الذكاء الاصطناعي مع أدوات التعلم الآلي للبحث عن البيانات الطبية وتخزينها وتحليلها لصالح الأطباء وصحة المرضى بطرق مختلفة. ومع التقدم في خوارزميات التعلم الآلي وتقنيات المعلومات الحيوية، أصبح الذكاء الاصطناعي جزءاً أساسياً من مجتمع الرعاية الصحية الحديث. تدعم خوارزميات الذكاء الاصطناعي وتطبيقات التعلم العميق الأطباء في إدارة السجلات الصحية، وتشخيص الأمراض واتخاذ القرارات السريرية، ووصف الأدوية، وتحديد الصحة العقلية، وتحليل التصوير. يحصل الأطباء على وصول سريع إلى المعلومات والأبحاث ذات الصلة باحتياجات المرضى. نظراً لأن بعض الخوارزميات تتنافس مع الأطباء وتتفوق عليهم أحياناً، فمن الضروري دمج هذه التكنولوجيا بالكامل في الممارسات الطبية اليومية. ومع ذلك، يجب أن ندرك نقاط القوة والضعف في الذكاء الاصطناعي، والحصول على وجهات نظر الخبراء خارج المجال الطبي لتمكين إدراج الجوانب الأخلاقية والفلسفية والاجتماعية والنفسية والسلوكية والاقتصادية لسلوك الآلة عند فهم التفاعل المتطور بين الآلات والبشر، بحيث يمكن استخدامها لأغراض مفيدة. لا يمكن اعتبار تقنية الذكاء الاصطناعي بديلاً للأطباء، بل يمكن أن تعمل كدعم للأجهزة متعددة المهام لتخفيف العبء على الأطباء حتى يتمكنوا من تقديم رعاية أفضل للمرضى على كل المستويات.

Artificial intelligence (AI) with machine learning tools are used to search, store, and analyze medical data to benefit both physicians and the health of patients in various ways. With the advancement in machine learning algorithms and bioinformatics techniques, AI has become an essential part of modern healthcare society. AI algorithms and deep learning applications support clinicians with managing health records, making diagnoses and clinical decisions, prescribing medication, determining mental health, and imaging analysis. Clinicians gain rapid access to information and research relevant to the needs of the patients. As some algorithms compete with and sometimes outperform clinicians, it is necessary to fully integrate this technology into daily medical practices. However, we must recognize the strengths and weaknesses of AI, and obtain the perspectives of experts outside the medical field to enable the inclusion of the ethical, philosophical, sociological, psychological, behavioral, and economical aspects of machine behavior when understanding the evolving interaction of machines with humans, so that it can be used for advantageous purposes. AI technology cannot be considered a replacement for physicians, rather it can act as multiple task-oriented device support to ease the burden on clinicians so that they can provide better care of life to patients at every level.



Artificially intelligent computer systems are used extensively in medical sciences. Common applications include diagnosing patients, end-to-end drug discovery and development, improving communication between physician and patient, transcribing medical documents, such as prescriptions, and remotely treating patients. While computer systems often execute tasks more efficiently than humans, more recently, state-of-the-art computer algorithms have achieved accuracies which are at par with human experts in the field of medical sciences. Some speculate that it is only a matter of time before humans are completely replaced in certain roles within the medical sciences. The motivation of this article is to discuss the ways in which artificial intelligence is changing the landscape of medical science and to separate hype from reality.

The capacity of AI in healthcare apps to swiftly analyze enormous quantities of patient records aids in identifying illness signs and patterns that might otherwise go unnoticed by medical experts. Medicine and artificial intelligence (AI) have many possible uses, from analyzing CT scans for early diagnosis to forecasting results from digital medical records.

Utilizing AI in hospitals and clinics may make medical facilities more sophisticated, quicker, and more effective in treating thousands of patients globally. Artificial Intelligence is undeniably powering the future of healthcare, revolutionizing the way patients receive high-quality treatment, reducing doctor expenses, and enhancing patient satisfaction.

AI in Healthcare Apps: Types

Artificial Intelligence is a general term that refers to several different yet connected activities. Some of the most prevalent uses of AI in healthcare include the following:

Machine Learning (ML)

Machine Learning includes training algorithms using big data sets, particularly those from health records, to create models that can classify data or predict results.

Robotic Process Automation (RPA)

RPA is the practice of automating administrative and clinical operations using AI in computer programs. Several healthcare organizations use RPA to enhance the quality of care and the regular operations of their services.

Neural Language Processing (NLP)

NLP is the application of ML to comprehend spoken or written human language. Medical field uses NLP to understand written materials, including reports, notes, and published research.

Deep Learning

Deep learning is a subtype of machine learning that uses more extensive data sets, extended training periods, and several layers of ML algorithms to create neural systems that can handle increasingly tricky tasks.

Application of AI in Healthcare Apps

AI is solid to implement accurate and effective technologies to provide better medical care, from utilizing it to find connections between genetic codes to

increasing hospital efficiency. Using AI in healthcare has several advantages over conventional data analysis and medical decision-making techniques.

Because AI algorithms can comprehend training information, the tools become increasingly precise, enabling people to get previously unattainable data on treatment fluctuations, diagnoses, and patient results.



1. Illness Forecast

Around the globe, the frequency and death rates of chronic illnesses are rising. Nevertheless, considering the patient's knowledge that is now accessible, artificial intelligence algorithms forecast such disorders.

These strategies and technologies can assist medical professionals in spotting these diseases considerably more quickly, encouraging early action and hastening the decision-making process.

Additionally, it may make it possible to analyze images faster and cheaper, allowing doctors to take more scans and provide better-focused therapy. Breast and skin malignancies, cardiac arrest, respiratory infections, and eye problems are successfully detected using this method.

Timely disease risk assessment hence aids patients in initiating therapy earlier and inspires them to alter their poor dietary, daily routine, and fitness practices.

2. Enhancing Chatbots-Based Primary Care

Driven by AI tools integrated with ML algorithms, patients can ask questions about their well-being using chatbots, and NLP to help them solve the issue. These chatbots are accessible around-the-clock and aid in the automation and seamless operation of primary care.

This medical solution helps lighten the pressure on medical professionals so they may concentrate on more urgent and severe patients. Additionally, it prevents needless hospitalizations and reduces time and money spent on unneeded doctor visits.

3. Health Tracking Using AI Wearables

AI-driven gadgets and innovative technology might provide healthcare facilities with a creative, competitive advantage. By 2025, the market for wearable AI health care will worth \$180 billion, according to GMI.

By providing patients with digital guidance and the option to reach out to actual medical personnel for support, it helps patients more effectively. Furthermore, they organize health records, protect confidential patient information, make doctor appointments, remind patients of follow-up visits, and perform other duties.

For example, portable cardiac monitors and mobile apps use machine learning algorithms to provide remote monitoring and guidance of heart issues by medical professionals. AI-driven wearables may be fantastic tools for healthcare professionals looking to enhance their clinical workflows and cut costs due to their portability, precision, and simplicity of use.

4. AI-Powered Robotic Procedures

Collaborative robotics and artificial intelligence have transformed surgery. Many healthcare professionals are using robots to help them during operations that call for quickness, accuracy, control, and adaptability.

This accuracy assists in preventing unwanted or accidental actions during operations, which reduces difficulties, lowers patient safety concerns, and speeds up recovery. AI-enabled robots use an illustration of a robotic process to effectively plug the abnormal voids connecting the uterus and the bladder.

5. Improved Medical Assessment

Doctors must consider every relevant detail when assessing patients, necessitating interacting with unorganized information in health records.

We may save and analyze massive amounts of data through different AI engines and Natural Language Processing, making it easier to evaluate and provide suggestions for each patient uniquely and enhancing medical decision-making.

It may also use transcription generation and text summarization algorithms to extract the key elements of the patient's dialogue with the doctor and summarize them into more precise and well-organized data points. This lessens the need for detailed records, reduces doctor exhaustion, and enhances the standard of treatment.

6. Streamlined Assessment of Radiographic Images

Medical professionals may glean significant details from complicated pictures, such as CT scans and MRIs, using big data and deep learning technology. The program can give extra measurements and findings to support the radiologist's

analysis by analyzing trends in the digital photograph, which can lead to a quicker diagnosis.

In addition to providing an optimum, timely examination, it may enhance radiation workflow by attaining quality assurance and effectiveness and simplifying risk assessment, a valuable method of identifying patients in greater danger.

AI-based healthcare diagnosis will not replace radiologists; instead, it will increase their involvement in diagnosing and deciding, which will help decrease medical mistakes and mishaps.

Challenges to AI Implementation in Healthcare Apps

Healthcare applications can significantly benefit from AI technology. However, several obstacles are to be successfully overcome.

Ethics

When integrating AI into healthcare apps, several ethical concerns are considered. For instance, there can be issues with algorithmic bias or the effect on patient autonomy.

Data Privacy & Confidentiality

The confidentiality of patients must be protected since healthcare data is crucial. Implementing AI technology in healthcare apps necessitates the inclusion of appropriate safety protocols to ensure the security of patient information.

Compatibility with Current Systems

It might not be easy to integrate AI with current healthcare systems. The requirement for additional resources and staff training in using the latest innovations may arise for healthcare providers.

Lack of Standardization

The need for more standardization in healthcare data might make integrating AI into various systems difficult. It is hard to compare data from multiple sources due to the need for more standardization.

These difficulties highlight the importance of careful preparation and thought when integrating AI technology into healthcare apps. Medical organizations must solve technical issues like standardization and system compatibility while ensuring patient data confidentiality is secured, and ethical concerns are considered.

Guidelines for AI Integration in Healthcare Apps

Healthcare organizations should adhere to several guidelines to enable the effective use of AI technology in healthcare apps. Essential best practices include the following:

Maintaining AI Clarity & Openness

Healthcare organizations should ensure that the AI they use in their apps is clear and understandable. As a result, trust between patients and medical providers will increase, and technologies are employed morally.

Defining Unique & Targeted Scenarios

Healthcare organizations should pinpoint specific situations where AI might be beneficial, such as enhancing diagnostics or forecasting illness risk. This helps

with task concentration and guarantees that the innovation will be utilized efficiently.

Partnering with Patients & Healthcare Workers

AI should be created in conjunction with patients and healthcare practitioners. This will guarantee that technology is used in a way that is both morally and productively connected with the demands of both patients and doctors.

Providing Quality Data with Accessibility

Reliable and dependable outcomes from AI algorithms depend on the availability of accurate information. Healthcare providers should guarantee that all information is available to the systems and of suitable quality.

These best practices highlight the value of careful preparation and teamwork when integrating AI into healthcare apps. Healthcare organizations ensure that AI successfully enhances patient care and develop the healthcare sector by adhering to these best practices.



Advantages of AI applications in medicine

AI can positively impact the practice of medicine in various manners, whether through speeding up the pace of research or helping clinicians make better decisions. A few examples of AI applications are given in the following subsections.

AI in disease detection and diagnosis

ML models are used to observe risk factors in patients by examining the vital signs of patients receiving critical care. AI models can alert clinicians in cases of emergency by assessing the input data. Even complex conditions such as sepsis can be detected by a predictive AI model for premature babies, which is 75% more accurate in detecting severe sepsis. For example, Innocens BV by IBM uses AI models to predict sepsis in endangered newborns