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## A REVIEW ON ARTIFICIAL INTELLIGENCE TECHNIQUES IN HEALTH CARE

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### Abstract:

*AI is rapidly transforming the healthcare industry through task automation, enhanced diagnostics, and better treatment planning. AI can scan vast amounts of patient data to identify patterns and predict outcomes, leading to more accurate diagnoses and customized treatment plans. AI is also being used in drug research, clinical trials, and even the automation of administrative tasks, which allows medical staff to focus on patient care. The majority of recent research has focused on the potential benefits and challenges of integrating AI in healthcare, with few studies outlining the rational decision-making process for using new technology in the healthcare system. Hospitals must alter their operations in order to benefit from technology as part of the healthcare integration process. Lastly, we arrive to the conclusion that hospitals cannot effectively become technologically and digitally advanced unless they possess a thorough understanding of technology.*

**Keywords:** Artificial intelligence, Machinelearning, Deep learning

### 1. INTRODUCTION:

Personalized health information distribution, remote monitoring, and virtual consultations are just a few of the ways artificial intelligence has been employed in recent years to enhance healthcare delivery. Information about individual health is one of the main advantages of AI in healthcare. AI systems are able to evaluate patient information, including medical records and lifestyle choices, to give patients personalized health recommendations. By using this information, patients can have a better understanding of their health and make more educated decisions about their care. Remote monitoring is a significant way that AI is being used in healthcare. Patients can view and track their vital signs using AI-powered remote monitoring devices, which also notify medical staff of any possible problems. By lowering the need for in-person visits to medical facilities, this can result in improved patient outcomes and quicker intervention.

Because of the complex integration of multimodal systems, the application of AI in healthcare systems requires substantial progress in areas including privacy, large-scale machine learning, optimization, and model performance (6). Two fundamental issues need to be fixed in order to successfully integrate AI into healthcare: data security and insights-based analytics. Complete openness and trust are necessary for a successful data and security integration. Likewise, data analytics and insight are essential.

## 2. LITERATURE REVIEW:

Litjens et al (3) proposed techniques for deep learning to improve the impartiality of histopathologic slide analysis. evaluating the ability of deep neural networks (DLN) to detect prostate cancer using digital histopathology slides that have been stained with H&E. The scientists used DLN to accurately digitize histopathology for the identification of prostate cancer in biopsy tissues. Using data from over 350,000 people with cardiovascular disease symptoms and the Framingham study's dataset of 5,209 patients with CVD, which tested and compared the Framingham risk score experimentally,

Weng et al. (4) proposed machine learning technique for CVD prediction. They put out a method for forecasting the risk of CVD that is incredibly accurate. It has been demonstrated that applying machine learning algorithms significantly improves the precision of assessing the risk of CVD. Consequently, the greatest number of patients is recognized.

Due to the increasing technological advancements in the healthcare industry, large amounts of data are also being generated in various health databases; yet, little effort is being made to use this data to prevent diseases [5]. Moving from manual to automated healthcare systems is necessary to improve patient care and the utilization of medical resources. To solve this problem, contemporary data processing technologies like artificial intelligence (AI) are required.

The healthcare business has been very interested in artificial intelligence (AI), and specifically machine learning, because it can detect and predict high-risk groups for adverse health outcomes and develop public health interventions that are used in the public health sector [6]. In the healthcare industry, artificial intelligence (AI) can be used to improve patient outcomes and experience, add value, improve quality and safety, support evidence-based decision-making, and maximize the efficiency of the healthcare system [7].

In human clinical practice, artificial intelligence (AI) can reduce diagnostic and treatment errors by utilizing machine learning to investigate computer algorithms that improve task performance based on prior experiences [8]. In many critical care units, for instance, adverse hemodynamic events and other post-operative patient crises may be expected [9].

The creation of intraoperative clinical decision support based on this prediction enabled the use of active systems in healthcare. Moreover, machine learning is utilized to detect drug-medication

interactions during pre- and post marketing surveillance due to the ease with which multidimensional drug characteristics may be obtained.

The term "HRO" highlights a Highly Reliable Organization (HRO) by having a "accountable care organization (ACO)" or "health maintenance organization (HMO)" oversee its services [10]. This is because evidence-based care methods and strict disease management pathways are what health systems rely on to address needs and regulate behaviors in accordance with industrial healthcare delivery services.

Despite the fact that 40% of Americans have more than two chronic conditions and 60% have at least one, the prevalence of chronic illnesses is steadily rising, resulting in USD 3.3 trillion in healthcare expenses each year [11]. Furthermore, the emergence of the infectious disease, which the WHO initially identified as COVID-19 on February 11, 2020, after it was first reported in Wuhan, China, in 2019 [12], fundamentally altered this perception..

### 3. CHALLENGES:

The healthcare sector can benefit greatly from the use of AI, but there are also significant challenges that need to be overcome. It is believed that the following difficulties are extremely important: The ethical concerns that accompany the application of AI technology, including possible violations of informed consent, patient autonomy, and data privacy and confidentiality, need to be addressed.

In the fields of PM, AI, ML, and BD analysis, strict data security laws are needed to adequately safeguard patient privacy, especially for individuals undergoing medical care. Additionally, access to vast quantities of high-quality data is necessary for AI systems to do accurate analysis. Healthcare data is frequently provided in a fragmented fashion with insufficient consistency and interoperability, which can lead to problems with accuracy and completeness. There are many challenges in maintaining data quality, accessibility, and standards.

AI's use in healthcare decision-making presents several ethical challenges. It is important to carefully examine who is responsible for AI results, potential biases in data and algorithms, and the responsibility and transparency of AI algorithms. Regulatory frameworks and suggestions are constantly emerging to address these challenges. It may also be difficult to integrate AI with the current processes and systems used in the healthcare sector.

For AI technology to be used effectively, obstacles such ensuring smooth integration and compatibility with old systems must be overcome. Understanding how to use AI knowledge most effectively and responsibly, as well as healthcare legislation that may limit the technology's full potential, are two other major hurdles to anticipate. Healthcare professionals will face significant challenges from a clinical standpoint because they are no longer the only ones with the authority to give medical therapy.



Patients, who in certain cases may be more knowledgeable about their conditions than the medical professionals, are also the people they must answer to. Medical personnel may also need to consider recommendations from an AI machine that may have superior knowledge on some subjects. However, in both situations, it is the responsibility of the medical experts to assess the information and provide the appropriate care, which may or may not mirror the recommendations of the AI technology.

#### **4 APPLICATION:**

##### **1. Data bias:**

To train the AI model, a lot of information is needed, including health data. AI models that are trained on insufficient or incomplete data may produce unrepresentative results because of social prejudice (such as limited access to health care) and small sample sizes (minority groups, for instance). When the target population is not adequately represented in the training data, bias like this can also occur.

##### **2. Personal:**

Data pertaining to health care is the most private information that one person can possess about another. Regarding patient autonomy or self-government, personal identity, and well-being, protecting an individual's privacy is an essential ethical principle in the healthcare industry.<sup>8</sup> As a result, it is morally necessary to protect patient privacy and make sure that the right procedures are followed in order to acquire informed consent.

##### **3. The principle of ethical double effects:**

In the end, some discoveries are harmful since science is a backword. This is perfect for the boundaries of AI. Therefore, it is important to carefully consider the twofold effect ethics principle when employing AI, such as in gene editing and stem cell research.

##### **4. Problem of ethic related to research and biomedical medicine:**

Any new scientific approach, AI in healthcare applications must follow biological ethical norms. They are autonomy, benefit, justice, and non-crime. These include consent, privacy and security, voluntary participation, autonomous decision-making, and so on, and should be considered and applied in each deployment.

##### **5. CONCLUSION:**

AI could improve healthcare services in areas including early detection, treatment, and illness prevention. The delivery of health care is already changing. AI applications can be divided into groups according to the particular tasks they carry out and the strategies they use to achieve these objectives. A wealth of useful data has been produced in the healthcare sector as a result of the integration of data from various sources, including wearable technologies, genetic information from genome sequencing, electronic health records, radiological imaging, and even hospital rooms. In

health services, particularly in health care management, artificial intelligence (AI) must be used to diagnose and treat patients. This includes making medical judgments, particularly in predictive analysis. Although integrating AI is crucial for the public health sector, the problems include promoting early acceptance, sustainable deployment in the health system, disregarding the user's perspective, and underutilizing technology.

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