Chapter 6
Application of Artificial Intelligence in Healthcare Sector: A Multidimensional Perspective

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ABSTRACT

In this paper, we emphasize the recent innovations made in biomedicine and healthcare by applying AI. To better understand real-world applications of AI in the field, we have also included a case study that uses a convolution neural network to detect the presence of malaria in human cells. Numerous types of AI are already being applied in various fields such as cardiology and neurology for detecting cysts and tumors through digital image processing and dermatology for detecting and treating lesions and psoriasis. Moreover, significant evidence indicates its use in genomics and 3D bioprinting, which are both expected to revolutionize treatment. AI has increased the efficiency and reduced the workload of health professionals. There are unquestionably application instances in which AI performs healthcare activities as well as or better than humans. Our studies show that AI is largely restructuring the constitution of human well-being as a whole and is predicted to progress in leaps and bounds.

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1. INTRODUCTION

Radiology and other fields dealing with chronic disorders like cancer are using AI to create more precise and useful breakthroughs that will help treat patients and, eventually, find a solution. Artificial intelligence (AI) has many advantages over more traditional methods of analysis and clinical decision-making. It's no secret that AI systems improve their accuracy as they learn from new training data (Kirola et al., 2022; Johri et al., 2024). Insight into pharmaceutical variation, patient care, diagnosis, and results were never before possible thanks to this development. AI basically trains the computer or a device and allows machines to work basing the previous data and the given data, and use of it, and this information is used in various tasks like Patient data records, disease analysis, Previous medical history, etc. (*Artificial Intelligence in Healthcare…*, 2022).

Artificial Intelligence has proved to be a boon for the advancement of healthcare in the recent years (Jha et al.; 2023). Virology to neuroscience, cardiovascular surgery to generating sustainable organs, AI can assist with all. Also there has been a vast use of AI in cryogenics that has helped preserve important donor organs throughout all these years. Robotic surgeries and image processing has increased the survival rate of patients undergoing major and complicated operations. Even in optometry, AI controlled robotic surgeries have made LASIK surgery a big success. It is also being used in the field of psychology to generate predictive charts of human behavior, sentimental analysis and more.

AI has not only benefited medicine but also the doctors and users. It has reduced the workload of medical immensely. It also provides more precision in operations than before through the imaging and monitoring. Development of AI sustained healthcare apps has helped people through methods of telehealth, medication tracking, heart monitoring etc. It also helps users save the cost of tedious hospital visits and more. Thought it has a lot advantages, AI comes with its discrepancies. There are several privacy and security risks involved in the use of AI (Singh et al., 2020; Gupta et al.; 2022). Further, the personal touch of doctors has been absent since the rise of AI. It can also often give a false sense of security to patients and lead to fatal harm when malfunctioning.

In this paper, we will further discuss on AI being applied in healthcare and its benefits and losses.

2. APPLICATIONS

AI is being used in almost all sectors in healthcare. It has various applications ranging from chatbots, image processing, 3D bioprinting, precision medicine, treatment of rare diseases, robotic surgeries, emergency care, fraud detection etc.