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Editorial

Modern applications of artificial intelligence to health care: An editorial review

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1. Introduction

Advances in artificial intelligence permit enhancements in several industries (AI). Due to significant advancements in high-performance computing, Computer-assisted drug design technology's efficiency, speed, and cheap cost are vital to drug development. The healthcare industry increasingly utilises in drug discovery due to the rapid development of machine learning (ML) algorithms. Drug development recently adopted big data. Current machine learning (ML) algorithms have evolved into a deep learning technique with high generalisation potential and more efficient huge data handling, encouraging the integration of AI and computer-assisted drug discovery technology and expediting drug design and discovery. This article's primary purpose is to provide an overview of how AI technology has been applied to the drug development process as well as a comparison of its advantages to those of conventional methodologies. A schematic diagram elucidating A. I in various domains have been elucidated in Figure 1.

In addition, the limitations and challenges associated with the employment of AI in the pharmaceutical industries have been highlighted.

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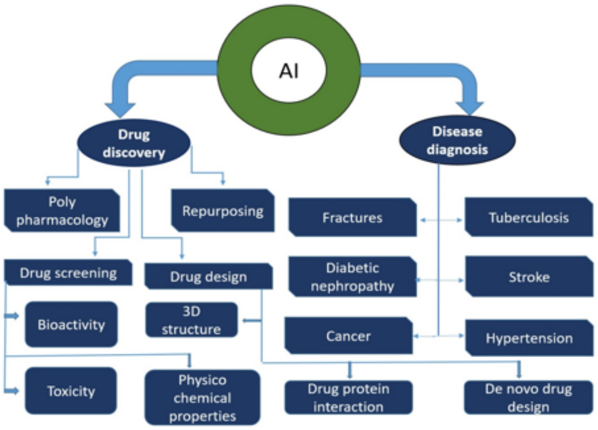

Fig. 1:

1.1. Deep learning to artificial intelligence: A machine intelligence approach to drug discovery

Making new medicines is a very important area of research for both healthcare industries and chemical experts. Still, there are obstacles and problems that make it hard to design and make new medicines. They include not working well, not getting to the right place, taking too long, and being too expensive. The process of finding new drugs is also made harder by the amount and complexity of data from clinical trials, genomics, proteomics, and microarrays. AI

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and machine learning are very important when it comes to researching and making new medicines. In other words, the field has progressed thanks to the introduction of deep learning algorithms and artificial neural networks. Peptide synthesis, structure-based virtual screening, ligand-based virtual screening, toxicity prediction, drug monitoring and release, pharmacophore modelling, quantitative structure-activity relationship, drug repositioning, polypharmacy, and physiochemical activity are just some of the drug discovery processes that have benefited from machine and deep learning algorithms. Deep learning and AI have a proven track record of success and should be applied in this industry. In addition, state-of-the-art modelling algorithms benefited greatly from state-of-the-art data mining, curation, and management practises. In conclusion, the recent developments in artificial intelligence (AI) and deep learning (DL) present a significant opportunity for rational medication discovery and design. Finding the resources, both financial and time-based, to develop new medications is a major challenge. The drug administration and development processes are problematic because of inefficiency, incorrect dosage, and incorrect target delivery. Artificial intelligence (AI) methods used in computer-aided medication design make it possible to circumvent the difficulties inherent in producing new treatments. As a subset of computer science, "artificial intelligence" encompasses a wide range of machine learning methods. The pharmaceutical business has made extensive use of deep learning, a sort of machine learning. Several types of algorithms, such as artificial neural networks, deep neural networks, support vector machines, classification and regression, generative adversarial networks, symbolic learning, and meta-learning, are employed in the search for and development of new pharmaceuticals. AI has been used in the design and development of drugs to solve a number of problems, drugs repositioning, QSAR modelling, protein misfolding, interactions of proteins binding, poly pharmacology, and synthesis of peptide are all examples of such arenas. Artificial intelligence has assisted with both initial and subsequent drug screening, biomarker creation, biopharmaceutical production, bioactivity and physiochemical characteristics, toxicity prediction, and pharmacological mechanism of action.

1.2. Significance of artificial neural network (ANN): Current scope and future implications

Artificial intelligence is influencing nearly every sector of the economy, and thus the future of human life. For the foreseeable future, it will continue to serve as the primary impetus for innovation in fields like big data, robots, and the internet of things. Chronic interstitial lung illness characterised by unusually high levels of extracellular matrix (ECM) deposition and remodelling of the lung parenchyma; also known as idiopathic pulmonary fibrosis (IPF). As a result, this causes permanent damage to lung tissue. While diagnosing idiopathic pulmonary fibrosis (IPF) might be challenging at present, it is typically done by a team consisting of medical professionals such as doctors, radiologists, and pathologists. As a result, developing new and practical techniques of detecting IPF is essential. This study's primary objective was to develop a novel idiopathic pulmonary fibrosis diagnostic model using machine learning. Genes that were shown to be differently expressed between IPF patients and healthy people were found by using a arbitrary forest classifier to prevailing genetic factor expression databases. These findings led to the identification of six genes, including CDH3, DIO2, ADAMTS14, HS6ST2, IL13RA2, and IGFL2. With these genes in hand, an ANN model was constructed to diagnose IPF, and its diagnostic accuracy was verified using many publically available data sets. All six of these genes were found to have a significant correlate with lung function, and two of them, CDH3 and DIO2, were also found to have a relevant correlation with survival. Researchers combined these results using an ANN model, pinpointing the main genes that distinguish IPF patients from healthy controls and paving the way for genetic diagnoses.

2. Roadmap for Pharmaceutical Companies and Research Fraternities

New chemical entities (NCEs) and research will drive medication development into a new era made possible by AI. As AI-driven technologies are demonstrating remarkable results, established pharmaceutical businesses still have several advantages. Funding, scientific knowledge, development know-how and experience, knowledge of regulatory requirements, and pre-existing branding and marketing teams that can construct a clear strategic aim and ambition all fall under this heading.

3. Conflict of Interest

None.

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