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# Deep Learning in Healthcare



Deeksha Kaul, Harika Raju, and B. K. Tripathy

**Abstract** Machine learning is quickly becoming an important tool for diagnosis and prognosis of various medical conditions. Complex input output mappings are dealt in deep learning, which is developed based on machine learning approach. Due to its efficiency and similarity to the working of the human brain, deep neural networks are a preferred method of processing and analysing medical data. In addition to diagnosis, deep learning is used to study the progression of disease, develop a personalised treatment plan and for overall patient management. This chapter discusses the architecture and working of deep neural networks and focus on its application in the detection and treatment of various diseases like cancer, diabetes, Alzheimer's and Parkinson's disease.

## 1 Introduction

Machine learning (ML) means teaching a computer to make decisions based on previous facts. The learning process is known as training. New data can be given to a trained model to make informed decisions. The more data fed to the computer for training, the more complex and specific rules and more accurate the predictions. Deep learning (DL) is a special case of artificial neural networks—a machine learning algorithm inspired from human brain. A neural network processes information in a way similar to the working of human brain, with various neurons connected in various layers. Deep networks have the ability to process vast data and generate rules for processing new data. From saving money to saving lives, ML is a huge boon to

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than other systems. Its performance can further be analyzed using a more extensive dataset for training the model.

## 5 Conclusions

This chapter presents fundamental concept of deep learning, its different types. Besides, it discussed on the application of deep learning in healthcare with special use in the diseases like those of Parkinson's, Alzheimer's, diabetes and cancer. The applications highlighted the prevention and detection of these diseases.

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