Machine Learning & Deep Learning in Health Care

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Introduction

The advancements of Machine Learning and Deep Learning has brought immense changes and advancements to the area of health care, marking the beginning of a new era of health and technology cooperation. These technologies have been through exponential changes and research spotlight, and its integration in the health field promises reliability, performance and innovation, including improvements in the diagnosis of diseases, prediction of patient outcomes, personalization of care (Assaad et al., 2019). This report aims to expand on Machine Learning and Deep Learning relationships with health care, including opportunities for Cotiviti.

Machine Learning & Deep Learning: Concept Definition

Machine Learning is a subset of Artificial Intelligence, defined as a science towards developing machines that learn and reason like humans, being a field that focuses on developing algorithms that can learn and make predictions or decisions without being explicitly programmed. It can be further divided into two categories, supervised and unsupervised learning. Deep Learning on the other hand, is a subset of machine learning, considered more advanced and focuses on independence of algorithms using neural networks with multiple layers to analyze complex patterns and relationships in data, inspired by neural network structures. These technologies allow algorithms to refine output based on the situation, learn from mistakes and accomplishments towards goals, and explore new paths towards a solution.

Trends in Health Care

The integration of Machine Learning and Deep Learning in Health Care is seen in a range of applications, given the biggest asset of healthcare being data, algorithms that can learn and adapt have been extremely powerful. Machine Learning is highlighted in image-detection, with

high accuracy predictions and classification, some of its uses in cancer detection provided high accuracy and performance. Deep Learning's impact on healthcare include personalization of medical treatment, chatbots, fraud detection, data analysis, and assistance in treatment strategies.

Opportunities and Threats

Recent advancements in Artificial Intelligence has brought up new opportunities in healthcare, generative AI developments, allow the analysis of immense data towards the creation of new content, and further the impacts, possibilities and adaptability of Machine Learning and Deep Learning in healthcare, allowing independence of technology and evolution without human supervision. Although the opportunities, these can also be seen as threats, as for data privacy concerns in the need for training of the datasets, biases of the algorithms that can produce unequal treatment and results based on imperfect or incomplete training.

Strategic Investments and Actions for Cotiviti

Given the discussed uses and impacts of Machine Learning and Deep Learning, a strategy for Cotiviti includes personalization of consumer engagement programs using data-driven healthcare recommendations. The use of generative AI allows for data augmentation for model training and simulation of real situations, improving already used AI models and providing planning in healthcare operations (Oakden-Rayner et al., 2020, Lu et al., 2016). Furthermore, the use of Machine Learning and Deep Learning provide personalized care plans and consumer based programs, for more adaptation to each consumer.

Conclusion

Machine Learning and Deep Learning are revolutionizing healthcare. By providing personalized, independent and accurate care, through AI models, it is possible to overcome challenges and adapt answers to new scenarios and find new ways of handling problems. These solutions are great investments for Cotiviti, being able to expand its already use of AI with newly developed areas, such as generative AI, and apply existing technologies towards its mission.

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