Short Communication

Deep Learning Advancements in Healthcare

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Machine learning is a broad term, and deep learning is a type of machine learning. The deep learning name originated from the use of many layers in the algorithmic network. Deep learning architecture is applied to various areas such as computer vision, natural language processing, image processing, speech recognition. The industry and academia's interest in AI have propelled the advancements in the last decade. Silicon Valley industries such as Google, Facebook, IBM, and research institutions are spearheading most of these advancements. TensorFlow is one of the most popular AI projects from Google. It is an open-source platform that has APIs so that the solutions can be implemented across various platforms. Python's scikit-learn and torch are other open-source platforms that opened here. Several modern deep learning techniques also originated.

The adoption of electronic medical record systems has been increasing steadily in the united states. To deploy any deep learning model, the team needs to have robust data. EMR's are contributing heavily to building data lakes, databases, and data warehouses. Reputed institutions are providing large de-identified datasets and making them available on open source platforms. THE Google AI team has developed an image library [1] that helps diagnose diabetic retinopathy. They have tested the model in a large eye care hospital in India, and the success rate was high. Google is also building AI technology [2] that helps physicians perform their routine note writing and paperwork tasks. This technology aims to offset the paperwork and increases overall productivity. Google is also building a predictive model to predict patient outcomes based on length of stay and others.

Despite the advancements in the healthcare field, there are various challenges faced by the healthcare domain to deploy artificial intelligence and machine, learning models. Healthcare data poses a significant challenge in terms of diversity - some are lab, radiology data, devices, genomics data. Standardizing the data also poses a challenge to harmonize the data across many platforms and prepare a large dataset to deploy these deep learning models. In addition, there is a need for more robust algorithms since these models will give outputs about life and death situations. Often, you would find significantly less labeled data, which makes it challenging to deploy machine learning models like natural language processing. Missing data and dirty data also pose a significant challenge for these advancements. Challenges exist in every field, but the healthcare AI domain has grown leaps and bounds by the partnership between industry, academia, and the community. This partnership would unravel exciting discoveries in the future.

Bibliography

1. "Google works with Aravind Eye Hospital to deploy AI that can detect eye disease".

2. "3 Ways Google Is Taking Healthcare Tech to New Heights".