Article reviewed: Deep Learning – Meetu Malhotra

Reference: https://statics.teams.cdn.office.net/evergreen-assets/safelinks/1/atp-safelinks.html

Summary: This document offers comprehensive review of deep learning, encompassing its historical background, core principles, and its influential effects across different sectors. The authors have in depth understanding of the advancements made in NN DL area and also have complete understanding of the bright future of deep learning.

Five C's:

Category: The paper falls under the category of Nature, Review on Deep Learning

Context: The paper focuses on review of DL concepts such as back propagation, linear, non-linear classification, shallow and deep NN, history of NN showcasing the evolution of NN from 1960, challenges faced and the future scope of NN

Correctness: The paper presents accurate information on history and future of DL

Contributions: This paper provided in-depth review of deep learning, especially in computer vision and object detection, changes, or advancements overtime in neural networks from back propagation, to FFNN, to gradient descents, its applications in various sector not limited to healthcare, automotive, energy consumption etc. in the field of speech recognition and NLP. It covers the RNN concept also which are designed for sequences to save small "memory" of previous inputs. It further covers the challenges of limited memory in RNN, and adds LSTM concept, which retains longer information to learn from the training data. It also covered the future scope of NN.

Clarity: The paper is written in a clear and understandable manner.

Outline: The paper follows a logical structure, starting with an introduction of DL, multiple layers usage in deep learning, weights adjustments using back propagation, optimizers (SGD), evolution of NN, from ConvNet classifiers with multiple layers to image detection, use of GPUs for faster training, use of DL in language processing, using vector representation of text data, usage of RNN with limited memory to LSTM with better memory. The final section covers future scope, combining ConvNets with RNNs, in reinforcement learning space and in NLP area, it mentions about usage of large language vectors in DL space for better results and applications.

Discussion:

Innovations: Since it's a review paper, it does not provide any innovative ideas, rather it covers the advancements done in the evolution of NN specifically for deep learning NN.

Assumptions: The paper assumes that the readers have fundamental understanding of neural network concepts such as shallow neural networks and maths behind back propagation.

Faults: Since it's a review paper, there is no limitation as such

Terminology: Deep neural networks, Deep learning CNNs, activation functions, back propagation, speech recognition, object recognition, natural language processing, RNN