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APPLICATIONS OF CONVOLUTIONAL NEURAL NETWORKS

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A DRAFT REPORT ON THE APPLICATIONS OF CONVOLUTIONAL NEURAL NETWORKS

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0.1 Draft Summary

This literature on the "Applications of Convolutional Neural Networks" looked at how CNNs evolved, how the CNN architecture differs from the Traditional Multilayer Perceptrons (MLP) and also the use of CNNs in face recognition, scene labeling, image classification, action recognition, human pose estimation, document analysis and Natural Language Processing (NLP). CNN is also compared with other deep learning architectures.

The applications of CNNs looked at in this article fell into two broad categories: Computer Vision and Natural Language Processing.

Computer Vision: The areas of computer vision included Face Recognition (with its associated problems such as the problem of identifying all faces in a picture, the problem of identification of unique features etc), Scene Labelling (where each pixel is labelled with the category of object it belongs to in scene labelling), Image Classification, Action Recognition, Document Analysis and Human Pose Estimation (where pose recognition and body part detection were considered as the two main parts of interest).

Natural Language Processing: CNNs have in recent times been used to solve NLP problems due to its competitive results (the ares of interest in this article being Speech Recognition and Text Classification). CNNs when used to solve Speech Recognition problems have been found to give better outcomes over Deep Neural Networks (DNN) in the areas of noise robustness, distant speech recognition, low-footprint models and channel-mismatched training-test conditions. In the area of Text Classification also, CNNs have been applied generally to classification tasks like topic categorization/ sentiment analysis where they also performed better in comparison with other methods.

In conclusion, CNNs performed better in comparison with other traditional methods in terms of accuracy and the boost CNNs give the system due to its unique features.