**Abstract**

As Deep learning becoming more popular nowadays and are widely used in today’s technology and in almost every fields, where convolutional Neural network are found to give the most accurate results in solving the real world problems. Convolutional Neural Networks (CNN) have provided an alternative for automatically learning the domain specific features. This paper basically summarizes the use and applications of CNN in various fields such as in face recognitions, image classification, scene llabelling and document analysis etc., also this paper described about how we can use CNN in the field of natural language processing for the text classification and speech recognition so overall this paper is comparison of CNN with the other methods like Deep Neural networks (DNN) to describe why CNN is better than all other methods.

**Literature Review**

Bhandare, Ashwin, et al. (2016) focuses on the convolutional neural network architecture which divided in different layers such as convolutional layer, non-linearity layer, pooling layer, and fully-connected layer. It described the CNN architecture in different layers such as :

1. **Convolution Layer** which is the core building block of CNN. The layers parameters consist of learnable kernels or filters which extend through the full depth of the input and each unit of the layers receives input from the neighborhood of the previous layers.
2. **Non-linearity Layer** is a layer of neurons which apply various activation functions. These functions introduce nonlinearities which are desirable for multi-layer networks. (Nair et all 2010)
3. **Pooling Layer** which takes small rectangular blocks from the convolution layer and subsamples it to produce a single maximum output from the block. Pooling layer progressively reduces the spatial size of the representation. It also controls overfitting problems. (T. Wang et all 2012)
4. **Fully Connected Layer** which performs high level reasoning by taking all neurons in the previous layers and connect them to every single neuron in current layer to generate global semantic information.

It also summarizes Convolutional neural network architecture and its applications which is summarized on two perspectives which is Computer Vision and Natural Language Processing where Computer vison is described as the image which is broke down into overlapping image tiles that are each fed into small neural networks, CNN composed of three layer stages followed by different classification module such as face recognition, scene labelling, Image classification, action recognition, human pose estimation, Document analysis in which It described all the features separately

1. **Face recognition** have some problems in which it detects all the faces in the picture and despite of bad lighting it focuses each faces.
2. **Scene labelling** describes Each pixel is labelled with the category of the object it belongs to in scene labelling.
3. **Image Classification** which compared with other methods, CNNs achieve better classification accuracy on large scale datasets due to their capability of joint feature and classifier learning.
4. **Action recognition** describes the difficulties in developing an action recognition system are to solve the translations and distortions of features in different patterns which belong to the same action class.
5. **Human pose recognition** which is the long-standing problem in computer vision. This is primarily because high dimensionality and high variability of possible body poses. (Ferrari V et all 2008)
6. **Document Analysis** which tend to be sensitive to stroke order, writing speed and other irrelevant parameters. It introduces an AMAP model which uses combination of CNN architecture.

In the second category of applications of CNN It categorizes various features under the Natural Language Processing (NLP) which are speech recognition and text classification where CNN has been used in speech recognition and has given a better results over Deep neural networks (DNN) and It summarizes the different research done over the years to prove that CNN is better over Deep Neural networks(DNN). Some of the domains in which CNN gives better results than DNN are: noise robustness, distant speech recognition, channel mismatch training test condition (Huang et all 2015) and low footprint models. It summarized the text classification in which NLP tasks deal with sentences and documents which are represented as matrix in the input and each matrix categorized as tokens.

**Conclusion**

According to the comparative researched results of CNN where Convolutional neural networks gives better results and performance than other model in terms of better accuracy, better performance and It shows better than other deep learning methods and its applications.