


Mobile Net Convolutional Neural Networks (CNN) 

What is MobileNet?

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1 Answer




Abhishek R S, Research Associate [Deep Learning] @ Ati Motors

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MobileNet is an architecture which is more **suitable for mobile and embedded based vision applications** where there is lack of compute power. This architecture was proposed by Google.

- This architecture uses **depthwise separable convolutions** which significantly **reduces the number of parameters** when compared to the network with normal convolutions with the **same depth** in the networks. This results in light weight deep neural networks.
- The normal convolution is replaced by **depthwise convolution followed by pointwise convolution** which is called as **depthwise separable convolution**.
- In the normal convolution, if the input feature map is of H_i, W_i, C_i dimension and we want C_o feature maps with convolution kernel size K then there are C_o convolution kernels each with dimension K, K, C_i . This results in a feature map of H_o, W_o, C_o dimension after convolution operation.
- In the depthwise separable convolution, if the input feature map is of H_i, W_i, C_i dimension and we want C_o feature maps in the resulting feature map and the convolution kernel size is K then there are C_i convolution kernels, one for each input channel, with dimension $K, K, 1$. This results in a feature map of H_o, W_o, C_i after depthwise convolution. This is followed by pointwise convolution [1x1 convolution]. This convolution kernel is of dimension $1, 1, C_i$ and there are C_o different kernels which results in the feature map of H_o, W_o, C_o dimension.
- This results in the reduction of number of parameters significantly and thereby **reduces the total number of floating point multiplication operations** which is **favorable in mobile and embedded vision applications** with less compute power.
- By **using depthwise separable convolutions**, there is some **sacrifice of accuracy** for **low complexity deep neural network**. For better understanding and for the metrics, one can read the paper mentioned below.
- Link for the paper - [Efficient Convolutional Neural Networks for Mobile Vision Applications](#) 

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