# MobileNet Summary

- New Type of Convolution block was introduced in this Paper which called "Depth wise separable convolutions"
  - It is basically Convolution along the depth/channels of the output feature map from a convolution operation
  - These operations consist of 2 steps one is Depth wise convolution which only approximately contains $5\%$ of the parameter corresponding to that convolution block and the next step is point-wise convolution that is a basic 1x1 convolution that is applied on the feature map obtained from the Depth wise convolution which contains approximately $95\%$ of the parameters corresponding to that convolution block
  - Using this, we can drastically decrease the number of parameters in the model with very less compromise in accuracy
- There are 2 more hyperparameters that are introduced in this paper that are Width and Resolution Multiplier
  - Width Multiplier: This hyperparameter is helpful to how much the width/number of channels in the output feature maps are to be reduces according to the user's requirement
  - It is denoted by the symbol $alpha$
  - It is multiplied to the number of channels of each layer in the network architecture to tune the width of the model
  - As a trade-off to the ability to extract high level details
  - The computation is promotional to $alpha^2$
  - Resolution Multiplier: This hyperparameter is helpful to tune the resolution of the input image
  - It is denoted by the symbol $rho$
  - As a trade-off it decreases the amount of detail inputted into the image
  - The computation is promotional to $rho^2$
- These set of MobileNets are mostly used in applications were there is a strict limitation to hardware capabilities