



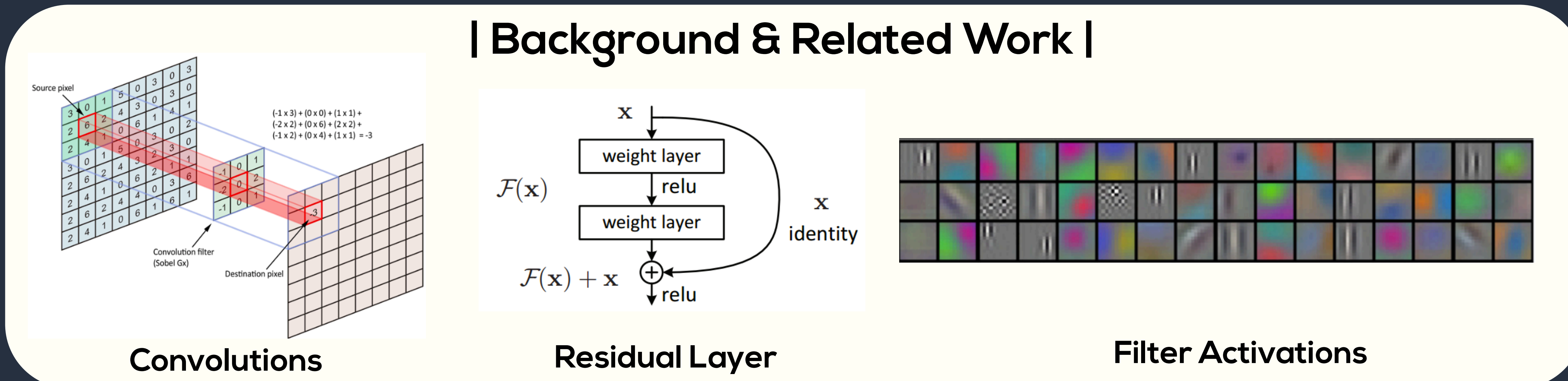
# Landmark Identification: Comparing CNN Architectures on a Practical Use-Case

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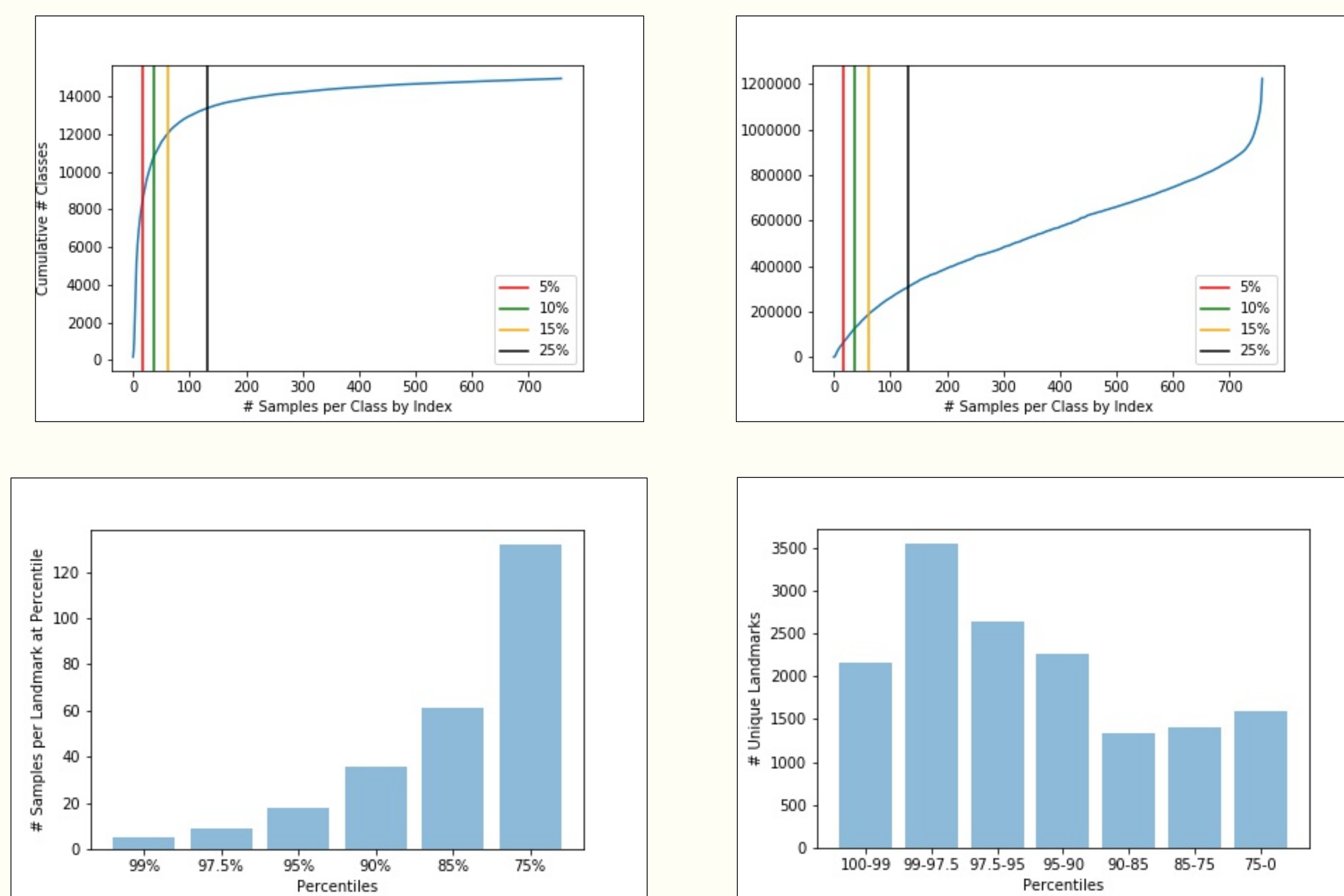
## | Abstract |

We find which one of three popular CNN models performs best on a series of sample size percentile intervals at classifying landmarks.

Our aim is to deduce which of our models will perform best on the overall landmark dataset by reducing the data into respective percentiles and training our models on proportional sized datasets.



## | Data Processing |

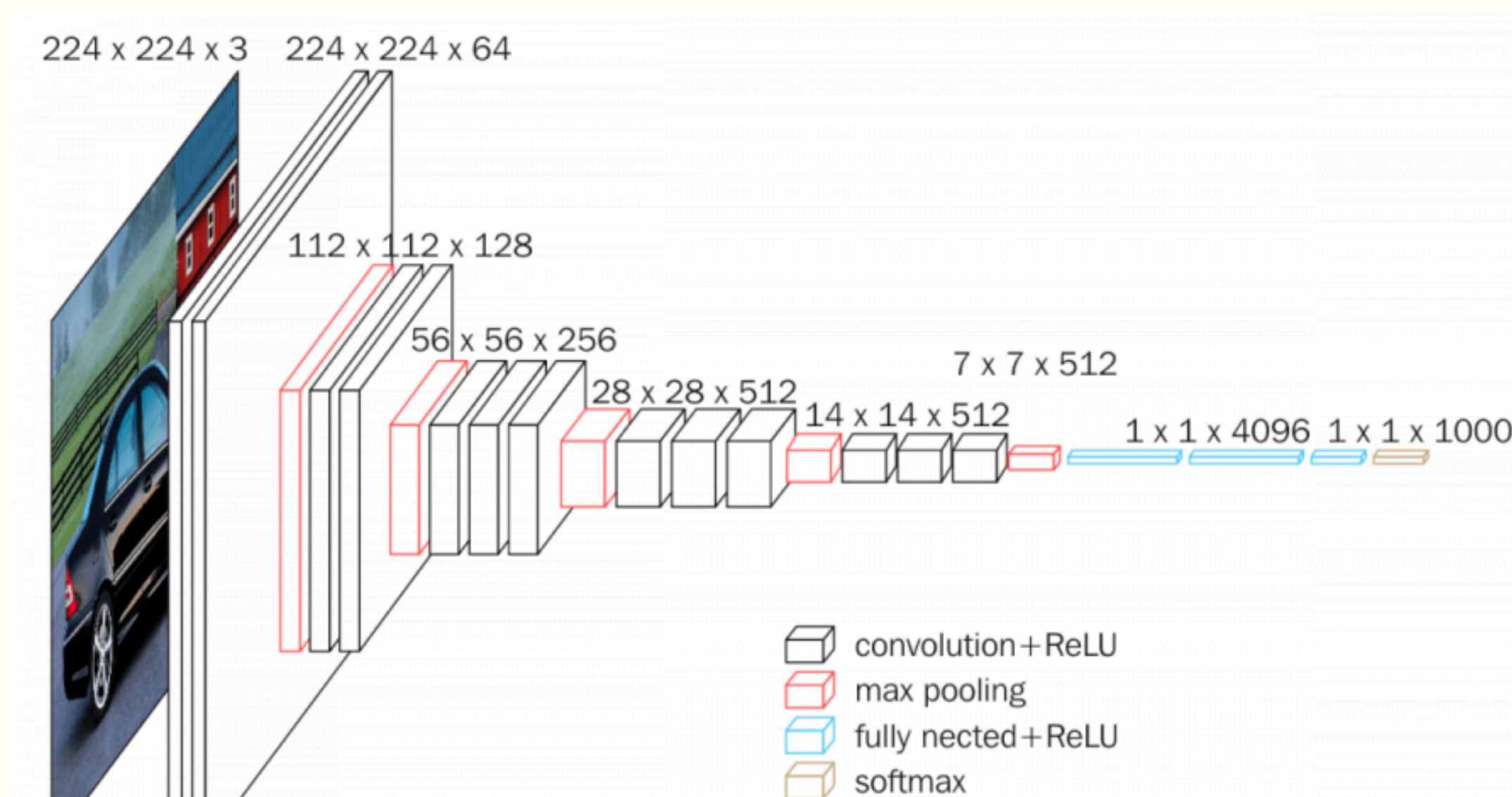


## | Results |

## | Model Architectures |

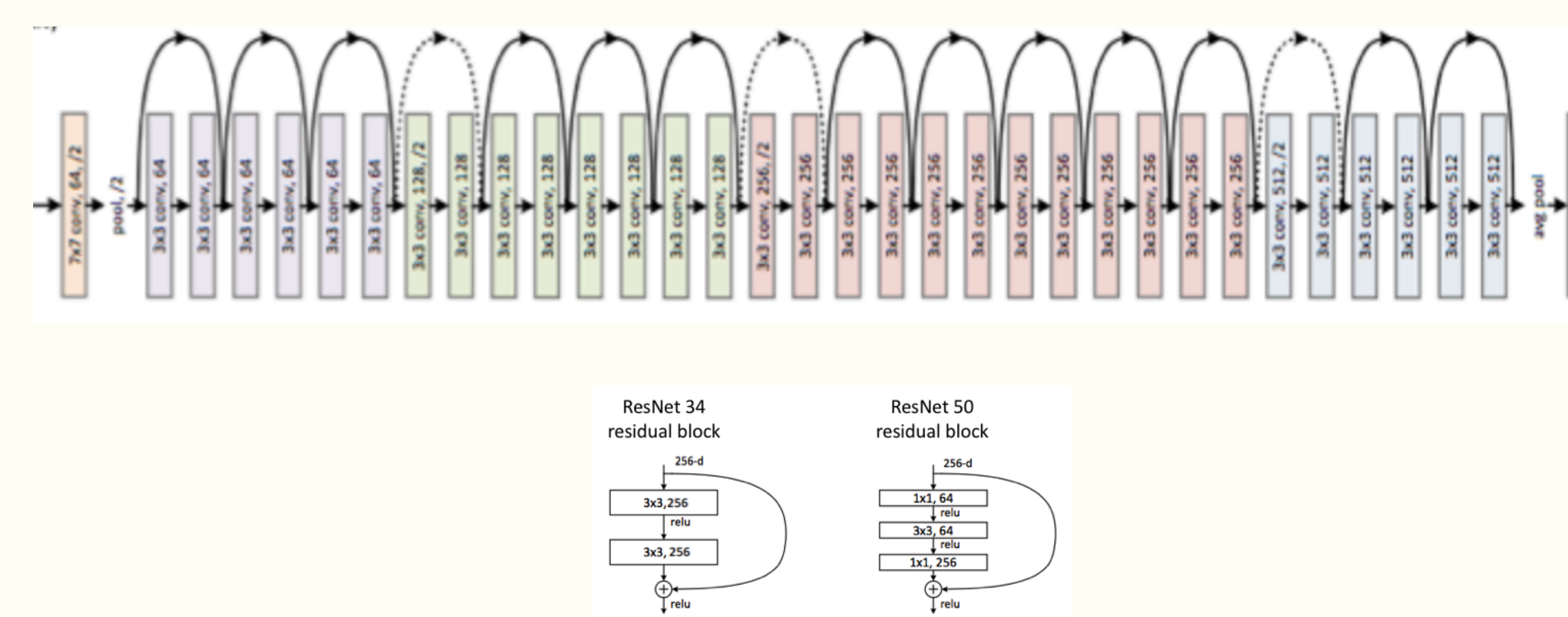
### VGG16

VGG16 (2014) employs only 3x3 convolutions, but leverages a large number of filters to achieve accurate results. With a total of 16 convolutional layers, the model has 138 million parameters



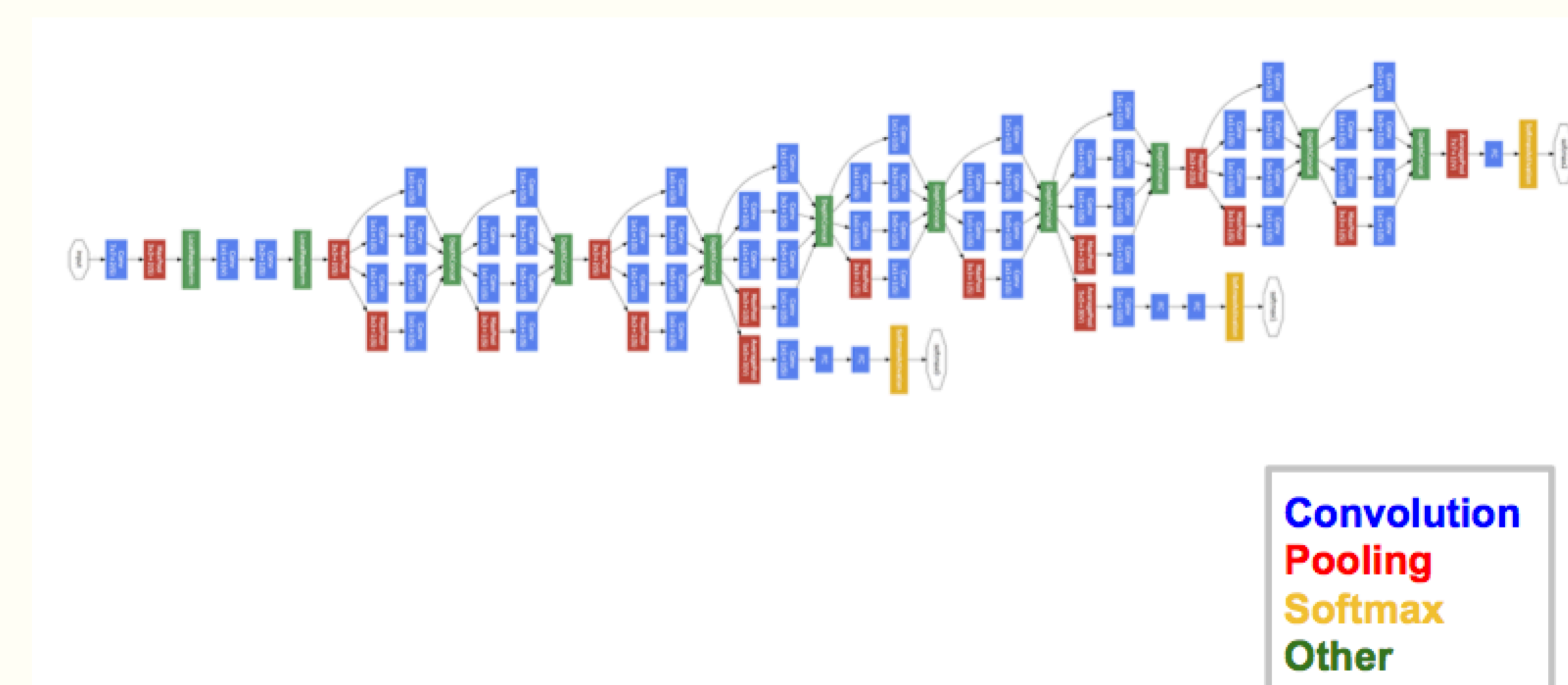
### ResNet 50

ResNet (2015) is popular in both 34 and 50-layer forms. After noticing that adding more layers eventually increased the error rate, residual networks were created to adjust the input feature map for higher quality features by creating residual blocks in which intermediate layers learn from the input.



### GoogLeNet

For GoogLeNet / Inception Net (2013) an inception cell is used as a basic unit on which several convolutions of different scales are run and results are then aggregated.



## | Conclusion & Discussion |

The CNN models that we used for our comparison were VGG, ResNet 50, and GoogLe Net. We found that for all percentile datasets our validation accuracies were highest using our GoogLe Net model, followed by ResNet 50, and VGG. The validation loss followed a similar pattern.

We found a strong correlation between the number of samples per classification, and the number of epochs required before overfitting the data / reaching a valid accuracy. Cross validating epoch-accuracy values across the percentiles could indicate which would perform best over the entire dataset.

Interestingly, we found that our accuracy values of the 95-90% sample size percentile range were comparable to that of the lower ranges for our given dataset sizes. We would be interested in seeing to what extent this changes as our dataset grows.

## | References |

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