Machine Learning: Assignment 2

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1 Introduction

In the world today there are many methods that fall under the category of "Machine Learning", some being very simular and some very different. All of them share in common that they use data to produce a model that can be used on unseen data. When sucessful this is very appeling in todays society when we got lots of data on situations where there is likely to be a underlying pattern, another requirement for learning. There is broad agreement that machine learning is a good way to make prediction and classification models, and often the only computational feasible way. This makes it a task to decide which method in machine learning to chose for a given problem. The answer is not always the same and several methods can be good, but for different reasons. In this task I will show several different machine learning algortihms and how they perform on classifying pictures of handwritten numbers.

2 Methods

2.1 Tree based methods

2.2 Neural Networks

For Neural Networks I have decided to use a convulutional neural network because of it great performance in problems that can be represented as an "image". This because it convolutional neural networks(CNN's) works by recognizing paterns in images or represented as a matrix or tensor(multidimension matrix) in the computer. It does so by using convolutional, pooling and voting layers. Multiple of these can be stacked to create a very a precise recongising images.
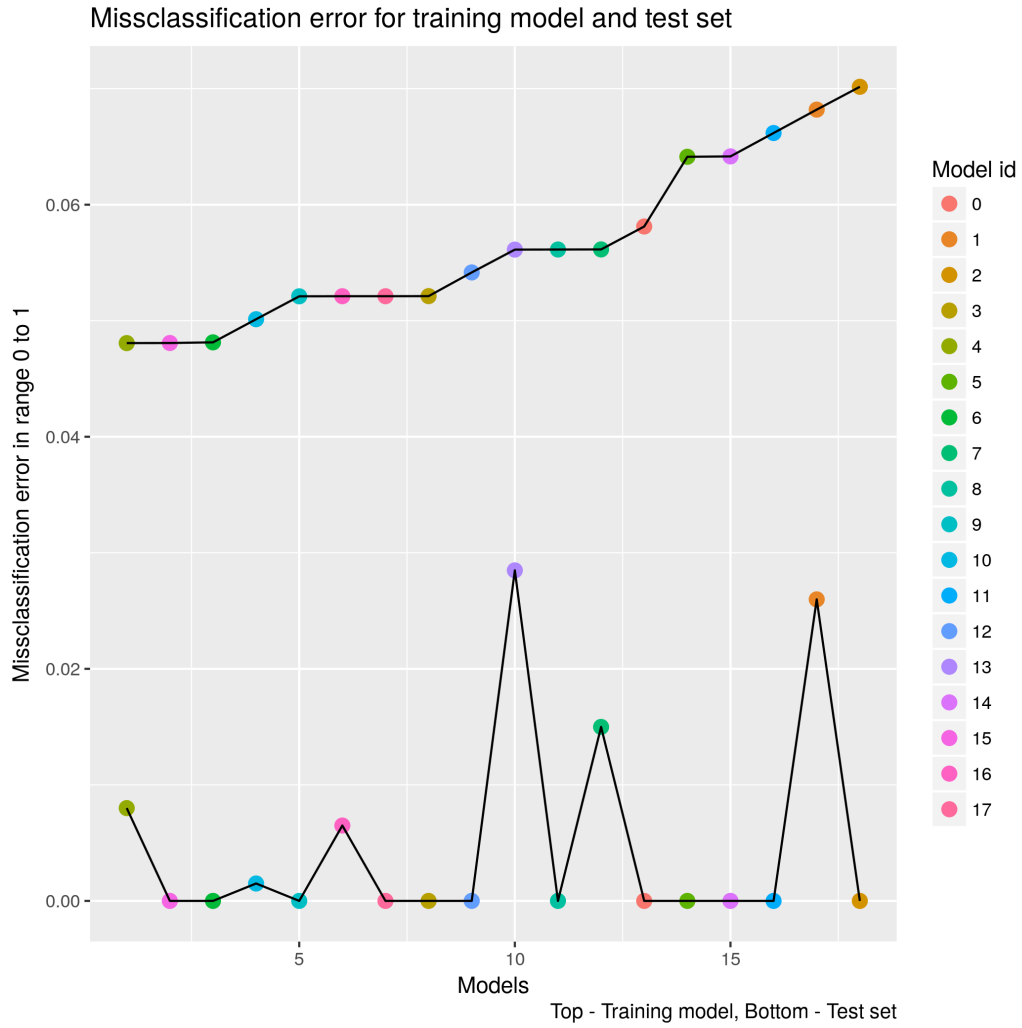
Figure 1: Error measures E_{out} and E_{val} are plotted for different sizes of training and validation sets.

2.3 Support vector machines

3 Results

4 Discussion

5 Acknowledgments

6 Appendices