Group 14: Review

October 19, 2019

1 Summary

In this report, the authors run experiments to compare the efficacy of feature extraction from deep CNNs and classification using Support Vector Machines and a custom classifier that chains Support Vector Machines with a shallow CNN. The report is a concise description of the experiments and results.

2 Strengths

The report is pleasingly concise. Purely from a writing standpoint, this is probably one of the best reports I have seen so far. The language is precise and the grammatical errors are reduced to the minimum.

3 Weaknesses

The report, as similar to other reports, also seems to rush past the conclusion – the conclusion section is almost a rehash of the Abstract.

As would be apparent from the section on technical quality that follows, it is possible that there is a bug in the implementation that could potentially completely change the conclusions made in the report.

4 Evaluation on Clarity and quality of writing

Overall: 4.5/5 (very good)

As mentioned before, the report clearly explains the models uses, methologies used, data used in clear language. The visualizations are appropriate and not overpowering. Grammatical errors, as stated before, are reduced to the minimum, thus denying misinterpretations of the content. There are occasional errors but they do not hamper understanding of the report.

5 Evaluation on Technical Quality

Overall: 3.5/5 (good but with a potential inaccuracy)

Overall, the report is technically quite precise and accurate. However, the results (test accuracies of the models) are significantly lower than what I observed in other reports. This indicated a possible implementation error. Upon perusing the code, in `ResNet_SVM.ipynb`, I do not see any normalization applied to the images in the MNIST dataset. As the author knows that it is important to normalize input images before using a pre-trained CNN to bring them to the same scale as the images in the dataset on which the model was originally trained. The normalization here would be dictated by summary statistics from ImageNet dataset upon which the CNN was pre-trained. Fascinatingly, this normalization has been applied in the implementation in `ScatNet_VGG.py` when the author is training a model that chains scattering net with either a shallow CNN, a multi-layer perceptron or a linear model – here the author uses the same sufficient statistics for normalization that should be used with a CNN pretrained on ImageNet, even though here we are not using a pre-trained CNN and neither is the training dataset ImageNet. I think these are bugs in the implementation which are resulting in erroneous values of classification metrics. I fully understand that I might have misread the implementation but if this is indeed a bug, then the conclusions in the report can potentially completely change.

6 Overall rating

Overall: 3.5/5 (good but with a potential inaccuracy)

Overall the report is well written with only essential information. There is a potential implementation error which could change the accuracy numbers which is also factored into the overall rating.

7 Confidence on assessment

Overall: 3

I have read the report in detail. I have read through the code in some detail and have attempted to point out a potential bug in the implementation.