Group 10: 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 Logistic Regression, Support Vector Machines and Linear Discriminant Analysis with feature extraction using scattering nets and using the aforementioned models for hand written digit recognition (on the MNIST dataset). The run similar experiments to identify forgeries on a given dataset of Raphael's paintings.

2 Strengths

In general in the earlier sections of the report, there is a decent amount of thoroughness. t-SNE visualization of before and after effects of scattering transform definitely aids the reader in gaining an intuitive understanding of the transform. There is also a decent amount of rigour in analyzing features using PCA and manifold learning.

3 Weaknesses

After the initial sections that analyzes features in a good amount of detail, there is a general lack of thorough analysis. The grammatical errors that are pervasive in the report also hinder understanding of some points. These things are covered more thoroughly in the coming sections.

4 Evaluation on Clarity and quality of writing

Overall: 3/5 (average)

As generally stated before, the clarity of the report suffers sometimes with confusing use of grammar. A few examples could be noted as follows:

- In section 3.2.1, the authors write: "There is insignificant different from original feature and standardized feature data."

- Section 3.2, the authors write: "We compare the performance of original feature data and standardized feature data...", where they probably mean to convey that they are comparing the summary statistics/distribution of the data. No training/prediction has yet been done, so talking about "performance" might mislead the readers.

5 Evaluation on Technical Quality

Overall: 2.5/5 (poor)

I think the report overall lacks rigour in the right areas. The authors are very rigorous while describing PCA and t-SNE and what the input dataset looks like, but they are not nearly as rigorous while describing their experiments with the models. This leaves the reader with a lot of unanswered questions like what if we used a non-linear classifier instead of logistic regression? What if we extracted features using ResNet or any other pre-trained CNN, for that matter. What is a scattering transform and what does its performance in extracting features tell us about the pre-trained CNNs or the scattering transform itself?

Also the rigour in PCA does not quite align with the theme of the project: the report should just use PCA/t-SNE as tools while trying to argue what the extracted features look like from one model to the other. Arguing about how principal components explain the variance of the dataset, while important, does not explain why scattering net performs as well as other pre-trained networks.

There is no mention of a code repository anywhere, so none of the results can be verified and also it would be very hard to reproduce the results.

The footer on page 1 says "33rd Conference on Neural Information Processing Systems..." which is probably left there because the authors are using the template from NeurIPS, which is good but it is bad form to not proof-read and leave the footer there.

6 Overall rating

Overall: 2/5 (below average)

Overall, in my opinion, the report has a large list of improvements that the authors can embark upon. It would also be very important to see the code underlying the analysis

7 Confidence on assessment

Overall: 3

I have read the report carefully. There was no code, or link to a repository provided so I have not been able to verify the results.