**CaoZeng: Dimension Reduction and Classification on Hand-written Digits**

Summary of the report:

The project aimed to perform dimensionality reduction and classification on a hand-written digits data set. PCA, MDS and t-SNE were applied to a data set and the results were visually compared. PCA with parallel analysis, PFA and 2D t-SNE were then used for feature selection and the reduced features of each method were passed to a random forest classifier.

Describe the strengths of the report:

Three different dimensionality reduction techniques were described in detailed and applied to the data set. The report provided an intuitive visual comparison of the methods.

Describe the weaknesses of the report:

There are some logical inconsistencies in the analysis (see “Evaluation on technical quality” below).

Evaluation on clarity and quality of writing: 4

Report is generally well-written and organized. It may be beneficial to elaborate more on the big picture of why dimensional reduction techniques are necessary (i.e. lower computational costs, selecting more representative features, what are the implications of this? etc.). Section titled Future Work does not suggest any future work.

Evaluation on technical quality: 3

PCA, MDS and t-SNE were used for visualization but not all techniques were used for the classification portion (RandomForest+MDS missing). The flow of the report may benefit if the same techniques were used.

Report mentions “PCA is very fast, while t-SNE would take a lot more time to compute” but does not provide quantitative values for comparison.

Report mentions “PCA as a feature selection tool is not promising”. This may be the case for qualitative visualization, but the reported classification metrics do not support this claim.

Overall rating: 3

Confidence on your assessment: 3