

## Homework #2

Traditional classifiers such as SVMs, Random Forests, Naïve Bayes, etc. will continue to be relevant despite deep neural networks making great strides and providing exceptional performance on a good number of problems. A few of the reasons behind this include:

**Interpretability:** Traditional classifiers tend to be more interpretable than deep neural networks. They allow us to understand the importance of different features and how they contribute to final predictions. This is crucial in many domains where interpretability and understanding of the decision-making process are important.

**Computational Efficiency:** These classifiers generally require less computational resources in terms of memory and processing power, making them suitable for systems with constrained resources. They also tend to train faster than deep neural networks, particularly on smaller datasets.

**Performance on Small Datasets:** Deep learning models often require large amounts of training data to achieve high performance, while traditional classifiers can perform well even on smaller datasets.

**Robustness to Overfitting:** Traditional machine learning models are typically less prone to overfitting compared to deep learning models, particularly when appropriately regularized or when the dataset size is small.

Taking the case of an SVM, your task is to pick up one or two of the above arguments and support them using experiments on a real dataset. For example, if you decide to make your case on computational efficiency, you will train a neuralnet and SVM and make some measurements on a computation resource of your choice on your computer. If you decide to tie your work to the dataset size argument, you will design some experiment looking into data size connections with classification performance. Finally you will use results from your experiment to support the argument.

Your experiment description and results/discussion should be about 1 page (maximum of 2 pages if you have too much to write). There are no restrictions on libraries or platforms you can use. Feel free to adapt any free code online for your experiment, except you must cite any sources accordingly and highlight whatever you modified. Submission: Your source code and report.