Assignment 3 – SVM Classification

Machine Learning @ Uni-Konstanz 2018

Idea

- Train and test SVMs with different datasets.

We focus on understanding and comparing the performance of the SVM classification methods seen in class. Depending on the dataset different kernels may suggest high performance. We study the influence of regularization and kernel hyper-parameters on SVM performance for the case of 2D Datasets.

Data

- Linearly separable dataset;
- Checkerboard dataset;
- 'Ripley' dataset;

For an example on how to load these datasets, please take a look at `examples\example_datasets.m`.

Tasks

See `assignment-3-task.pdf` (specifically, Task 1 on Page 9).

Notes ⚠

Write your assignment code following the same rules as for the previous assignments and use the assisting code from Tutorial 6.

Please avoid creating unnecessary scripts/function files, as this makes the code harder to grasp in its entirety.

Good programming rules apply: - Use meaningful variable names. - Use indentation. - Keep your code tidy. - Add a minimum of comments (if you deem then necessary).

Good work!

Acknowledgement

This code heavily borrows from the ML_toolbox repository: "a Machine learning toolbox containing algorithms for dimensionality reduction, clustering, classification and regression along with examples and tutorials which accompany the Master level course Advanced Machine Learning and Machine Learning Programming taught at EPFL by Prof. Aude Billard".

The main authors of the toolbox and accompanying tutorials were the TA's from Spring 2016/2017 semesters:
Guillaume de Chambrier, Nadia Figueroa and Denys Lamotte

3rd Party Software

This toolbox includes 3rd party software: - Matlab Toolbox for Dimensionality Reduction - LibSVM - Kernel Methods Toolbox - SparseBayes Software

You DO NOT need to install these, they are already pre-packaged in this toolbox.