MLND intro projects rubric

Project Rubric

Students: this short document describes what we hope - at a high level - you get out of the introductory Jupyter project notebooks contained in this directory. For more granular instructions please see the individual notebooks themselves.

Learning objectives:

Students following the instructions in each notebook will tinker with parameters and settings of various machine learning algorithms to get an intuitive feel for how these settings affect the learning process, as well as final results. By playing around students can see immediately the results of these changes (on both a toy and real face-detection dataset), and in particular how a poor choice of model parameter leads to poor quality predictions.

Data exploration and Algorithms:

Students will explore (currently) three datasets: two toy 2-dimensional datasets and a face detection dataset consisting of images of people in natural environments. More specifically they will tune the parameters of various popular machine learning algorithms to perform classification on each dataset as follows.

1. For the face detection notebook: students play with the SVM parameter 'C' in order to determine better / worse values in terms of final detection accuracy on a test image. Poor detection accuracy occurs when a) all faces in the image are not found b) falsely detected faces are found in the image or c) both of these occur

2. For the nonlinear slider demo: students tinker with the parameter settings for a kernelized SVM ('C' and 'gamma' for the nonlinear version), decision trees ('max_depth'), and neural network (hidden_layer_sizes') to find good fitting values, as well as for values that underfit or overfit the data. In each case a poor choice of parameter leads to either underfitting or overfitting of the given model (see this notebook for further explanation of these two terms).