Departamento de Electrónica, Telecomunicações e Informática

EXPLORAÇÂO de DADOS

**Homework IV: Model Evaluation**

# 1 Background

Evaluation of classification models are based on testing the trained models in a new data set, called the test set (often also called validation set). The performance scores are based on the confusion matrix estimated with this new data. Another aspect to take into account are the strategies to split the available data set into subsets in order to have an organized methodology to statistically validate the experimental studies. The following paper has a complete overview of these strategies

- `https://arxiv.org/pdf/1811.12808.pdf`

and the goal of this homework is to explore the ones related with comparison of models. The paper suggests several implementations which must be integrated into the programming tasks.

# 2 Homework

Choose one of the following tasks

- Programming task A. Read section 4.5 of the paper and implement/adapt the test to compare two models. The case studies can be the comparison of the following models
  - SVM (linear) versus SVM(RBF kernel)
  - perceptron versus multilayer feedforward neural network.
- Programming task B. Read section 4.7 of the paper and implement/adapt the test to compare more than two models. The group must include at least 4 classifiers of the list: SVM (linear), SVM (non-linear kernel), perceptron, logistic discriminant, multilayer feedforward network and KNN.

The data sets for the case studies are toy data sets ((*blobs, moons, circles*)

# 3 Useful Links

- Evaluation.
  `https://scikit-learn.org/stable/modules/model_evaluation.html`

- The package developed by the author of the publication `https://arxiv.org/pdf/1811.12808.pdf` `http://rasbt.github.io/mlxtend/`

REMARK: Whenever justified the group can consider to include the contribution of each group member to the homework.