Data Analysis & Pattern Recognition

Neural Networks & Deep Learning

Laboratory exercise

Gerard Escudero & Samir Kanaan

Lab: overview

You have several exercises to choose from, according to your interests and preferences.

- Work in groups of 2
- Choose **one** of the taks
- One delivery per group (on Atenea). Remember to include both names
- Deliver executed Jupyter notebook
- Explain why you do what you do; analyze the results you obtain
- Explore different options, compare them.

Lab: guidelines

1. Download and examine the data (attributes, classes, balances)
2. Prepare the data: missing, errors, encodings, normalization
3. Choose an evaluation protocol
4. Design, train and evaluate a neural network (or more)
5. Analyze the results obtained, propose improvements

Play and explore: reports with just the basics will not have max grade, you are expected to try different things, see what happens and compare the results.

Connectionist Bench (Sonar, Mines vs. Rocks) Data Set

Abstract: The following dataset includes data from underwater sonar readings. Its goal is to tell if a given reading is from a rock or from a metal cylinder (possibly an explosive mine).

- source / names / data

Avila Data Set

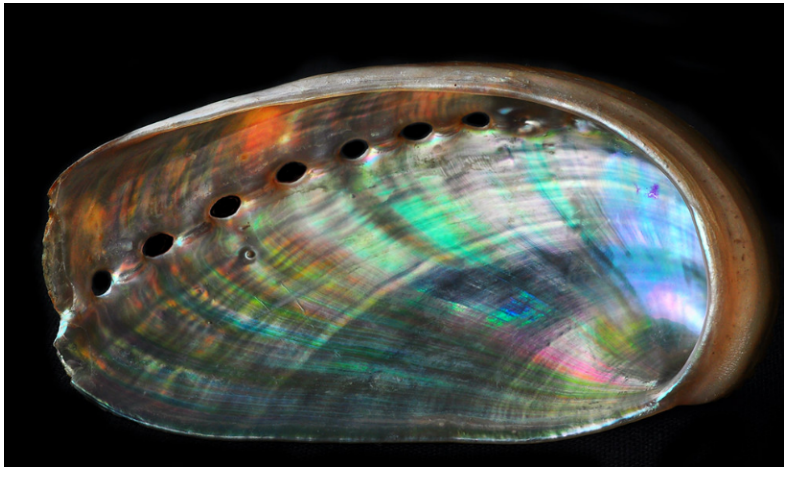
Abstract: This dataset is taken from a XII century handwritten Bible. There where several writers and the goal is to decide which one wrote each page given a set of features.

- source / names / training / test

Abalone Data Set

Abstract: The age of abalone clams (haliotis) can be determined by cutting their shell and counting the rings (as with trees). However this is a costly process, and the goal of this dataset is to infer the age from other physical properties.

- source / names / data



The CIFAR-10 dataset

Abstract: In this exercise you are going to build, train and evaluate a multiclass CNN classifier on the CIFAR-10 image dataset.

- source