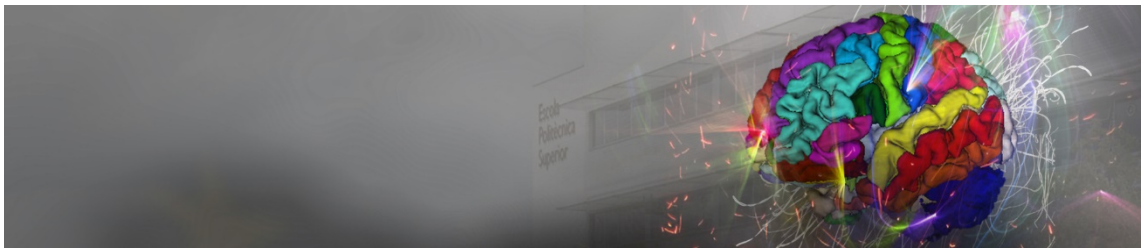
Computer Aided Diagnosis

The “Modern” December’s Project



Introduction

In this coursework, the goal is to develop a computer aided pipeline for diagnosis using a deep learning approach. We will provide you with a large dataset of images (the same you used in the previous project) and you can choose the strategy you want for solving the problem. This means, that you can test:

a) fine tuning strategies,
b) transfer learning strategies,
c) or / and design your own architecture.

This coursework is the continuation of the same project used in the classical approach, centred in the diagnosis of dermoscopic images.

Aims and Objectives

A **Information search**. It is important to know what other researchers do to solve this or similar challenges. Teamwork.

B **To design, analyse and implement approaches for automatic diagnosis**. Start with a simple approach (transfer learning, fine tuning with VGG19 or some other well-known models) and then improve the results. You can even design your own architecture.

C **To test the implementations with the provided images** (training and validation sets). For analysing and reporting the results of your approaches, you should use the validation set and show the confusion matrices. In this part, the validation images cannot be used for training.

D **To submit a final result for the testing set** (unknown ground-truth) that will be given during the last week of the coursework with the approach you consider the best one. We will use the results in this testing set to independently evaluate your algorithms. Notice that in this step, you can merge training and validation datasets to build a more robust training model.

E **Documentation**. Report all the trials and experiments, and analyse and explain the improvement on each step.

Coursework: on-site + discussion sessions

In this coursework we plan 2 on-site sessions per group. Additional discussion sessions can be arranged with your lab assistant. Attendance to the on-site sessions is compulsory (so, absence will be penalised).

The delivery of the work, will be done using the proper links of Moodle (la meva UdG):

A PowerPoint (8 min) with the following sections:
  1 Proposal analysis.
  2 Design and implementation of the proposed solutions.
  3 Experimental section and results analysis (qualitative/ quantitative analysis, speed, etc). Results should be provided for the validation set.
  4 Conclusions.

B Code with comments.

C The diagnosis of the images with unknown ground-truth.

Coursework evaluation:

The evaluation of the coursework is the mix of the following:

- **A** Work done during the labs sessions.
- **B** Presentation done after the coursework.
- **C** The results of the unknown dataset.

DEADLINE: It will be the one indicated in the Moodle submission link. Late submission will be penalised.