**Hands on #2**

**Classification** **(using Keras)**

**Problem #1:**

There are different methods of monitoring the ionosphere, one of the most used is with radar systems that take advantage of the reflective characteristics of the ionosphere and the properties of the propagation of electromagnetic waves. A problem that can be applied to different radar systems has to do with the ability to classify the echoes received at the radar antenna. In this exercise it is proposed to analyze a set of data corresponding to received echoes. When they are the result of a reflection in the ionosphere, they should be classified as a valid echo. The “ionosphere.data” file is available with recorded echoes that are already classified (positive return or not) manually by experts.

For this problem:

1. You need to build a classifier that allows to determine, based on the echoes (features) available from the radar, whether it is a positive echo or not (target).
2. During the data engineering stage:
   1. Determine if the data is balanced.
   2. Propose some technique for its balancing in case there is a significant imbalance.
3. Analyze the results from several generated models.
4. Show plots of loss function and accuracy of each of the models generated.