Schneider Electric Hackathon - Zero Deforestation Mission

Deforestation is the permanent removal of standing forests, which occurs for a variety of reasons and has many devastating consequences. It is important to stop deforestation, as soon as possible, before the damage is irreversible.

This challenge will consist of using the help of thousands of satellites in space to capture images of the earth's surface in order to detect, as soon as possible, areas in the midst of deforestation and prevent its expansion.

Exploring the data

First, and as a good practice in any data science project, a brief exploratory analysis of the data has been carried out. Each of the images is classified into one of three possible categories.

We have observed an imbalance in the data: for the categorical class with value 1 there is a smaller number of samples than for the classes with value 0 and 2. In order to try to reduce the effect of this imbalance in the training of the model, it has been decided to propose weights for each class that will be taken into account during the training of the model.

Each of the images has a size of (332, 332, 3), i.e. 332 pixels high, 332 pixels wide and 3 channels.

Models

In this project, two different models have been considered: on the one hand, a convolutional neural network. On the other hand, a pre-trained model such as *xception* has been used. This model has been trained on the huge *imagenet* dataset.

It has been observed that the second case has obtained a higher performance, this is due to taking advantage of the pre-trained model and all the information they have.

With the proposed hyper parameters we have not observed overfitting in the model. We consider the performance of each of the models to be good.

F1 score

The results obtained for each of the models are presented below (F1 metric):

	F1 score
CNN	0.55
Transfer learning + fine tune	**0.68**

Predictions

Our set of predictions presented in the repository correspond to the predictions made in the second model, i.e. the one in which we first performed the transfer learning technique and then a fine tuning.