4

To reduce the variance of our final neural network model we decided to ensemble multiple models and let the ensemble give the prediction. The way this has been done was dividing the already undersampled dataset in 5 different splits. In order to obtain the splits we used the sklearn class KFold. Each set has each class divided differently among the 5 datasets obtained in this way so that for each class the validation part does not overlap among the 5. The way the ensemble works is by summing for each image to predict the prediction of each model, passing from 5 arrays of shape (1,1,14) to one single array of this shape, the sum of the five. Then the argmax of this is taken to obtain the predicted class for the image.

4.1 Vgg ensemble

The results we obtained ensembling the vgg model ,on the hidden test set, in various numbers were superior to the ones obtained by one single model. The final ensemble consisting of 5 models scored 75% against the 63.77% of the single original model.

4.2 Inception ensemble

Starting from a model of 0.8943% we incrementally ensembled models in number obtaining an accuracy of 91% with an ensemble of 2 models and 93.0% with an ensemble of 3. Our final and best submitted model was at last obtained ensembling only the best 3 models in terms of validation accuracy among the five trained mentioned. This gave us a precision in the development phase of 93.58%.