Statistical Learning and Neural Networks

Transfer Learning

Lab duration: 3h

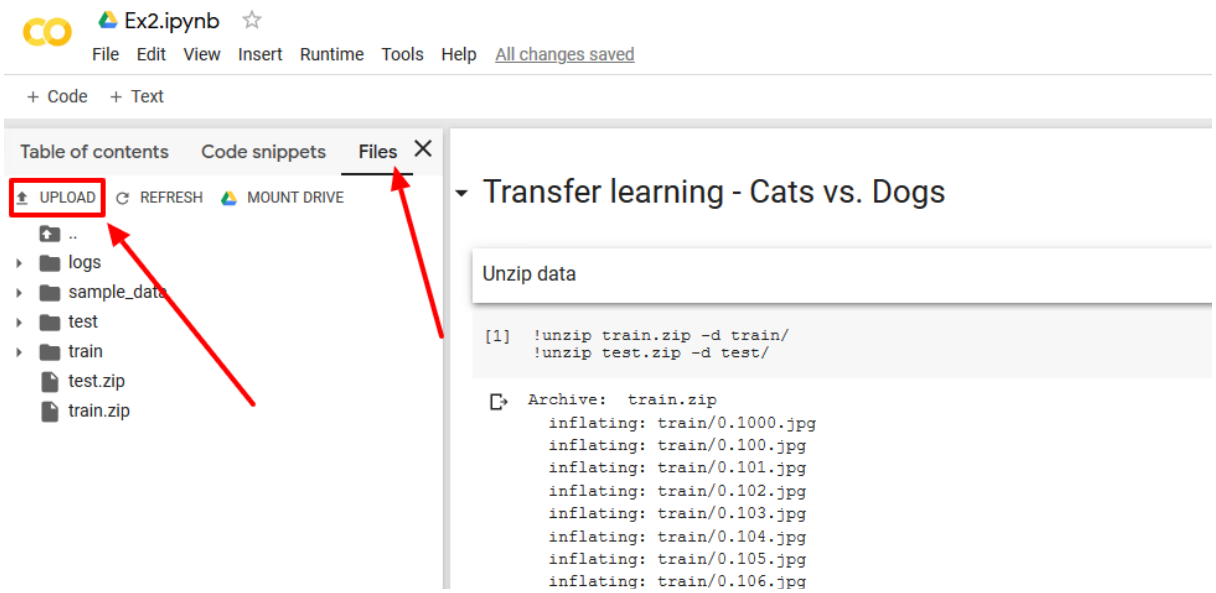
Download the starting notebook from Portale della didattica (lab2.ipynb) and upload it to Google Colab.

Exercise – Transfer learning

This lab will focus on using transfer learning to finetune an advanced CNN model trained on Imagenet to classify images of cats and dogs.

The “Cats vs. Dogs” dataset is provided as zip files for training (train.zip) and testing (test.zip). As first step you must upload these files to your Colab runtime.

1. Connect to the runtime following the procedure in the colab_instructions.pdf guide
2. Open the panel on the left side, go to *Files* and click *Upload*



3. Upload the train.zip and test.zip files (this may take some time)
4. You can now work on the notebook: the first cell will unzip the images into the train/ and test/ subdirectories

Fill the empty code cells of the notebook following the instructions. The final goal is to import the MobileNetV2 network pretrained on ImageNet and replace the last layer with a new one to be trained on the Cats vs. Dogs data. You will have to write a data loader that uses tf.data.Dataset and resizes all input images. The loss function is a softmax cross-entropy.

The target is to reach an accuracy >94% on the test set.