Módulo 5: Prueba técnica B

Desarrollo en lenguaje Python

Año de realización: 2021

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Introduction

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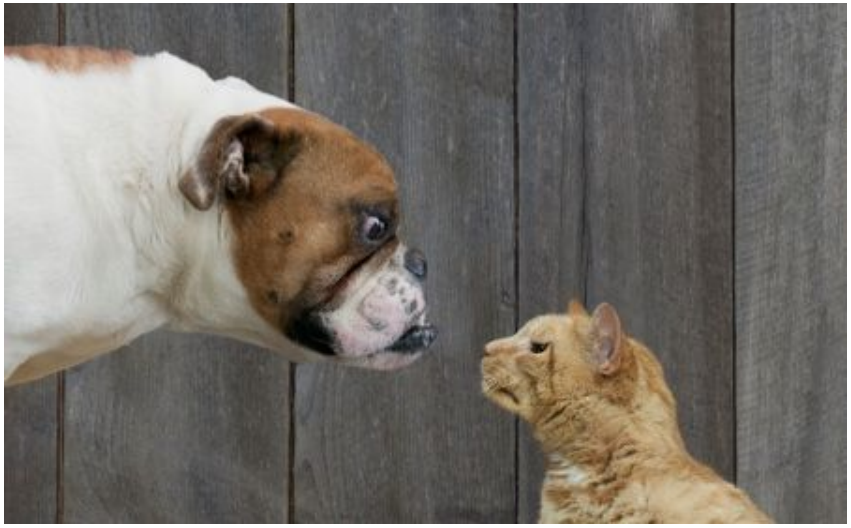
Introduction

The Dogs vs. Cats dataset that you'll use was made available by Kaggle as part of a computer-vision competition in late 2013. You'll use it to train a convnet for image classification, getting as much accuracy as possible.



Dataset

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Dataset

You can download the original dataset from here:

Dogs vs. Cats in Kaggle

This dataset has around 25000 images of dogs and cats (12500 for each class), tagged by user in captcha tests provided from Asirra.

We propose you to work only with 10% of the data. After downloading and uncompressing the data file, you'll create a new dataset containing three subsets: a training set with 1,000 samples of each class, a validation set with 500 samples of each class, and a test set with 500 samples of each class.

CNN Building

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Tasks

1. Explore the data and make the needed preprocessing the image dataset requires:
   a. Read the picture files.
   b. Decode the JPEG content to RGB grids of pixels.
   c. Convert these into floating-point tensors.
   d. Rescale the pixel values (between 0 and 255) to the [0, 1] interval

2. Build a convnet as a stack of alternated Conv2D (with relu activation) and MaxPooling2D layers. Use the amount of each one that give you the best accuracy without time and memory over-penalization. End up with feature maps of size 7 x 7 just before the Flatten layer.

3. Use the loss and optimizer you think better for image classification at the compiling step.
4. Train the model displaying loss and accuracy curves during it.
5. As you are working with few training samples, overfitting will be present. Use data augmentation (you can work with ImageDataGenerator instance in Keras) to avoid it.
6. To further fight overfitting, you'll also add a Dropout layer to your model, right before the densely connected classifier
7. Save your model.
8. To go further, we propose you to use a pre trained network: VGG16 model developed by Karen Simonyan and Andrew Zisserman in 2014

Extra

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To go further, we propose you to use a pre trained network: the VGG16 model developed by Karen Simonyan and Andrew Zisserman in 2014.

Try applying feature extraction, importing keras.applications module, importing VGG16, instantiating the VGG16 convolutional base and using ImageDataGenerator.

Submission

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Submission

Prepare a presentation with 4 or 5 slides explaining the process and conclusions.

Please, send files, graphs, images and everything you consider important to Carmen Bartolomé:

carmenbvg@gmail.com

If you prefer send the submission as a github link from your own repository, it's ok too.