Deep Learning on Images : Flower recognition

Nurlan, Zahara, Irina

The dataset = recognize flowers from pictures

- Kaggle Dataset
- 4242 labeled images of 5 different classes of flowers:
  - Daisy (764 photos)
  - Tulip (984 photos)
  - Rose (784 photos)
  - Sunflower (733 photos)
  - Dandelion (1052 photos)
- Images collected from *flicr, google images, yandex images*

The dataset = recognize flowers from pictures

- Photos:
  - not high resolution (about 320x240 pixels)
  - different proportions, no common size

Pictures of tulips from side, bottom, up, zoomed in and out, etc…



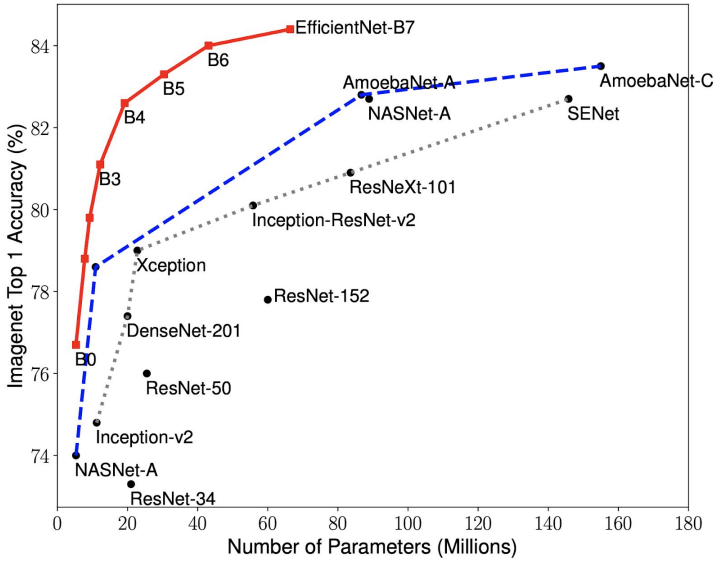

Not pictures of (real) Flowers

Pictures that doesn’t make sense, where are the flowers?

Q. What kind of flower is that?

We implemented **EfficientNet B0** object recognition system working on real images.

EfficientNet is a Convolutional Neural Networks that uses Model Scaling.



Application : identify the species of a flower based on a picture

EfficientNet

- Invented by Tan and Le in 2019
- Uniformly scales all dimensions of depth/width/resolution using a compound coefficient.
- Capable of a wide range of image classification tasks that makes it a good model for **transfer learning**.
- Pre-trained EfficientNet-B0 on **Stanford Dogs dataset** for dog breeds recognition.
- Perfect model for flower recognition

We followed this tutorial!!

Implement the processing chain

Import and library version control: !! REALLY IMPORTANT !!

- efficientnet
- Tensorflow version 2.1
- Keras version 2.3.1

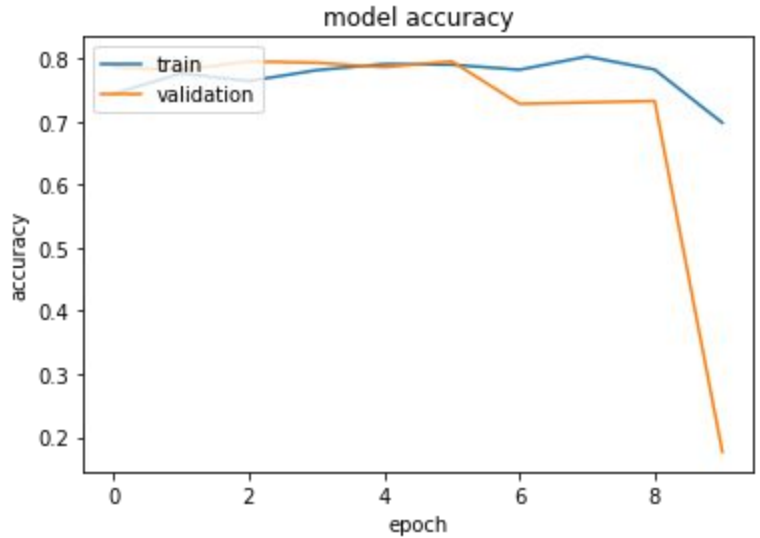
Data preparation:

- Split our dataset into train, test and validation

Implement the processing chain

Learning:

- For binary (sunflower & tulips) :
  - steps_per_epoch = 100, epochs = 5
    Train accuracy: 0.9281 val_accuracy: 0.9256
- For multiclass (5 species) :
  - steps_per_epoch = 50, epochs = 10
    Train accuracy: 0.7900 val_accuracy: 0.7953
  - steps_per_epoch = 100, epochs = 2
    Train accuracy: 0.7279 val_accuracy: 0.7209



Let’s test our AI!