„Is it Simba ?”

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Topic: Image Classification
Type: Bring your own data (but also a touch of “Bring your own method”)

Description
My project is inspired by my dog Simba, a three year old Golden Retriever. I will build a Convolutional Neural Network which should be able to identify if the dog on a given image is Simba or not (binary outcome).

I will collect around 300 pictures from Simba and mix it with pictures of other dog breeds from Stanford Dog Dataset. In addition I will add around 300 pictures from other Golden Retrievers including Simba’s family.

My expectation is that the CNN should be able to distinguish Simba from other Non-Golden dog breeds pretty well. When it comes to the pictures of Golden Retrievers from Stanford Dataset the task will be much more difficult and even more challenging when taking Simba’s family into account where some dogs look very similar as Simba. I will also experiment if the CNN recognizes specific personal belongings from Simba (leash, balls in his mouth, …).

From a technical point of view I plan to implement the CNN in Keras based on Tensorflow using Python. So far I basically worked with R but I think it is a good chance to get into Python.

Dataset

- 300 own pictures of Simba
- 1000 pictures of dogs from Stanford Dog Dataset which are not Golden Retrievers
- 150 pictures of other Golden Retrievers from Stanford Dog Dataset
- 300 own pictures of other Golden Retrievers

Project Plan & Milestones

- Exercise I – Initiate
    - Generate PDF Document with Project Description - done
    - Hand it in for approval – done
    - Adapt the document based on the feedback – 0.5 days

- Research & Knowledge build-up
    - Collect papers on the topic – 1 day
    - Learn more about CNNs – 2 days
    - Setup of infrastructure including Tensorflow and Keras – 1 day
    - Learn about handling of Keras and Tensorflow – 1 week

- Dataset collection
    - Collect pictures from Simba – 2 days
    - Collect pictures from other Golden Retrievers – 2 days
    - Get data from Stanford Dog Dataset – 0.5 days

- Building a prototype
    - Data preprocessing: 5 days
    - Designing and Training Network: 2 days

- Finetuning Network
    - Improving Data preprocessing: 5 days
    - Tuning Network: 10 days

- Building an application: 5 days

- Writing final report: 2 days

- Preparing Presentation: 2 days

References

Paper 1
Dog Breed Prediction using Convolutional Neural Network
Sneha I. Kadari, Shubhada S. Kulkarni, Sharada G. Kulkarni
International Journal of Engineering and Advanced Technology (IJEAT)
ISSN: 2249 – 8958, Volume-9 Issue-5, June 2020
https://www.ijeat.org/wp-content/uploads/papers/v9i5/D8058049420.pdf

Paper 2
Modified Deep Neural Networks for Dog Breeds Identification
Aydin Ayanzadeh, Sahand Vahidnia
Istanbul Technical University, 2019
https://www.researchgate.net/publication/325384896_Modified_Deep_Neural_Networks_for_Dog_Breeds_Identification

Dissertation

A Study on identification of dog breeds through multi-class classification using Deep Learning techniques
Mr. Renji Roy Isac
Dublin Business School, 2019
https://esource.dbs.ie/handle/10788/3720