Multimedia Project SoSe 23

Assignment 1

Multimedia Computing Lab
Prof. Dr. Rainer Lienhart
Katja Ludwig
Julian Lorenz

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Please take a look at assignment 0 on how to submit your work.

Only students who submit their solution for this assignment will get access to our student server!

Exercise 1.1 Image Batch — 5 Points

(a) Write a function `def build_batch(paths)` that loads the specified image files from your drive and constructs one tensor from them.

(b) It is only possible to build a batch tensor from your images if they have the same dimensions. Modify your function such that it can handle image files with different aspect ratios and sizes.

(c) Make sure that the batch is prepared such that the pretrained network from exercise 1.2 can use it correctly.

Exercise 1.2 Neural Network — 2 Points

Write a function `def get_model()` that constructs and returns a new ResNet18 neural network. Inside the function, initialise the network with pretrained weights.

Exercise 1.3 Forward Pass — 8 Points

Use your two functions to perform a successful forward pass on the provided images on Digicampus. For every image, output and submit the score and the class name of the most confident prediction.

Add an optional `transform` argument to the `build_batch` function. If this argument is set, it should override the default transform from exercise 1.1.

Try different transforms:

(a) use the defaults from exercise 1.1

(b) resize your images to different sizes

(c) flip the images vertically (not horizontally)

For every experiment, what do you observe and why? Not only describe, but also interpret your results and submit them as a separate file.