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Week project: Week 45, CNN

This week, we got introduced to Conventional neural networks. It is a network architecture for deep learning that learns directly from data.

Before beginning to do the homework, I tested Cats and Dogs algorithm, and the first problem I faced was the TensorFlow library. I was getting a mistake that my kernel could not identify NUMA node of platform GPU ID 0. It had taken me a couple of weeks before I found the solution.
`# pip uninstall tensorflow-metal` – this is the command that helped me, if I am correct, instead of using GPU, model starts to run on CPU.

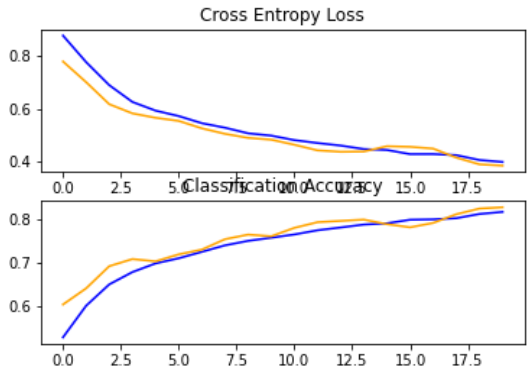
Thus, i got a chance to successfully train "cats and dogs " data. The result of accuracy that I got is 71% which is not a lot. I put some pictures of cats and dogs I took and the model predicted 3 of them wrongly out of 5. Besides, I also tried perfect photos from the internet and the output was that all of them got predicted correctly.

The results can be explained, the model was not trained that well.

Consequently, to make the homework algorithm more accurate, firstly, I followed the instruction the teacher wrote to make the program work for 3 classes, and then, I tried something new.

I added two more Conv2D layers with MaxPooling2D layers. The number of output filters in the convolution in both cases I set as 64. Moreover, for more precise training I changed the input_shape and target_size numbers to (300, 300, 3) and (300, 300) accordingly. The last thing, I implemented an augmentation structure.

Applied all these improvements give us an accuracy score of 82.73 and the plot looks accordingly:



This can be called successful training because looking at the graph the curves get closer to each other with crossing point.

Hence, we can see that the method I used in training the homework data is much better, more precise that the one in cats and dogs algorithm.

By the way, it took 3 hours for my laptop to train the data, I guess it is because I had an additional photo gallery with horces and I used more layers.

Summarization:

The more you train your data, the more accurate it will be, we can see this in the examples below. In addition, the images that are used to train the data also affect the final result, they should be more diverse so that the model has a better idea of what, for example, a cat looks like.