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Computer Science 4990 – 02

Spec Topics for UD Students

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**Project Assignment II – Task No. I (Age Estimation) Report**

The purpose of this assignment was the implement a machine learning technique that can estimate the age of a given dataset using the implementation of Keras. We were provided with a dataset of 28,360 train images with attached ages, and 7090 test images without attached ages as expected. This gave us a total dataset of 35,450 sample images. Some preliminary steps I first used before building my model were things like first resizing my images. An issue I came across was the fact that many of the images had a variation in shape. This would essentially create a flaw in my model as some images would be in shape (x, y) whilst others would be in shape (x, y, z). For example, looking at the skimage docs, you find that;

* img\_array : ndarray The different color bands/channels are stored in the third dimension, such that a gray-image is MxN, an RGB-image MxNx3 and an RGBA-image MxNx4.

For this reason, I upscaled all grayscale images to a 3D image. Upon doing this I then loaded all my new resized images into a single Numpy array of which called for easier data manipulation thus allowing for the capability to build a better model. In building the model, I then proceeded to have a look at my target variable and brought my target variable in shape. In doing this, I converted my target in dummy columns so that it would be easier for my model to ingest it. Finally came the actual building of the model. As the problem was related to image processing, personally felt it was wise to use neural networks to solve the problem. For this reason alone, I then built a simple feedforwarding neural network for this particular problem. First, I specified all the parameters I would be using in my neural network architecture. This of course included the number of neurons per each input, hidden, and output layer. Imported all the necessary Keras modules, and defined my network. I compiled my neural network and let it train for a while. Upon training, I then had to validate it as validation was necessary if I wanted to ensure that my model would perform well on both the data it was training and on any new testing data. Because this model seemed to perform good, I then opted to save the given predictions and summit via “.csv” as my final submission.