

CSCI181Y: The Quest for Prof. Dodds' Age

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Given that I (Nick) plan to go into machine learning for my career, I wanted to do something with neural networks for this project, and Josh happily agreed. I began by searching Kaggle for fun datasets to use and I came across one full of photos of faces labeled by age, gender, and ethnicity. I thought this would be a perfect dataset to use to train an age-predicting model. Josh and I thought it would be funny to theme our project around trying to determine Prof. Dodds' age, and so we did. We have stayed true to this vision throughout the project, ultimately having produced a model that is decent at predicting ages of people in photos.

We had to spend some time at the beginning of the project manipulating the image data from the Kaggle dataset into a usable form. For some reason, the creator of that dataset thought it was a good idea to store image data as strings of pixel values separated by spaces, with nothing to denote where one row and ends the next begins. I noticed that the number of pixels in each image was exactly 48^2 , and figured the images were all 48×48 pixels in size, which ended up being correct. We saved these images to a Google Drive. We could not have gotten through this part without Josh's wicked debugging skills.

Our model is overall pretty good at predicting age but is not perfect. It has a root-mean-square error of 8 years, which is better than we were expecting. There are, of course, limitations. For one, all the training images were 48×48 grayscale, meaning that the model only works on square (or cropped-to-square)

images, and color and fine details that cannot be represented in a small 48×48 image will not be considered by the model.

We had time to test two different pre-trained generalized computer vision models (ResNet and DenseNet) at varying network depths as the starting point for our local training. If we had more time, we would try even more pre-trained models and possibly even start from scratch with a CNN with randomized weights and biases. We also considered developing a web app for our model so non-coders can easily play around with it, but we unfortunately did not have time for that.

Looking back on the whole project, there is not much we would have done differently. The only thing we can think of is using a different dataset with images that are both larger and in color. I am sure such datasets exist, but they would come with the tradeoff that processing and training would take notably longer.

The best part of the project, undoubtedly, was the satisfaction that came when I ran our model on a picture I took of Prof. Dodds a few weeks ago and it predicted he was 42 years old!