The purpose of this project was to create a program which could determine the age, gender and race of a person from a static image of his or her face. To achieve this, three separate Convolutional -Neural Networks (CNNs) would have to be trained on large, publically available datasets. It is necessary to use convolutional layers when dealing with images, because in such high dimensions fully connected perceptrons will overfit and make the model useless.

The methods used for the three models are fortunately very similar, since they only differ in the number of categories. We used the Tensorflow Deep Learning Library to build the neural networks.

Unfortunately our hardware limitations unexpectedly severely impacted the project. Even the massively downscaled greyscale images take a very long time to train a model without a high-end graphics processing unit. This makes hyperparameter optimization slow and cumbersome, and thus only approximate numbers were used at this time. There is no obvious way around this problem without massively degrading the quality of the model.

Despite the difficulties encountered, we have a few ideas for additional features. It would be educational to compare the performance of models trained on different datasets and across different demographic categories. In a real-world application it would be useful to add a face classifier, i.e. a model that discards non-faces before proceeding to the other neural networks.