Applied Machine Learning

Project Proposal

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Project title

Face recognition and Gender classification

Motivation

Face recognition has been a hot application and research topic over the years. Recognizing faces with technical tools is important not only because it is useful to verify personal identity but also uncover criminals and deter crime. In this project, we would like to build a system to identify and verify a person and his/her gender from a digital image and test it on a large dataset of faces. After realizing these basic functions, ideally we would like to apply our system for a broader use such as classifying ages, automatically completing the missing parts of faces on images and so on.

Method

Nowadays, deep learning frameworks are popular among the world. Multitudes of data scientists begin to construct complex deep learning models such as GNMT, VGG and multi-layered CNN with the help of those deep learning frameworks.

Our task is to do face recognition and gender classification based on the ‘FaceScrub’ dataset. The field we are involved in is Computer Vision, which requires the command of the knowledge of convolutional neural networks. We decided to apply simple convolutional neural networks to the recognition and gender classification on face dataset, which might be the baseline of our project result, and then apply some relatively special structured convolutional neural networks such as LeNet, AlexNet, VGG and ResNet to the recognition and gender classification on face dataset.

We decided to implement our deep learning models with TensorFlow or PyTorch, which are the two most popular deep learning frameworks in the world currently.

Future of Work

Potentially, we aim to do more structured deep neural networks to improve the accuracy of facial recognition and gender classification or even age classification, and will try to do some experiments of face completion algorithms on the ‘FaceScrub’ dataset. Ideally, such algorithms will have some observed data as input and make predictions about the missing part of the image.