

Project Proposal

Group2

What problem did you select and why did you select it?

Facial expression recognition. The goal is to classify each facial image into one of the seven facial emotion categories.

It's a good topic for implementing convolutional network we learned in the class. Additionally, facial expressions convey nonverbal cues, and they play an important role in interpersonal relations. Automatic recognition of facial expressions can be an important component of natural human-machine interfaces; it may also be used in behavioral science and in clinical practice.

What database/dataset will you use? Is it large enough to train a deep network?

In this project, we used fer2013 as our dataset to train the model and also test with it. The dataset is FER2013, obtained from Kaggle. The data consists of 48x48 pixel grayscale images of faces. The faces have been automatically registered so that the face is more or less centered and occupies about the same amount of space in each image. The task is to categorize each face based on the emotion shown in the facial expression in to one of seven categories (0=Angry, 1=Disgust, 2=Fear, 3=Happy, 4=Sad, 5=Surprise, 6=Normal).

The training set consists of 28,709 examples. The public test set used for the leaderboard consists of 3,589 examples. The final test set, which which was used to determine the performance of the predicting, consists of another 3,589 examples.

What deep network will you use? Will it be a standard form of the network, or will you have to customize it?

We are considering LeNet, AlexNet, Googlenet and resnet. But we think we will decide one or two network mainly used based on the preliminary exploration. These are all standard classic networks and we will change some parameters of them.

What framework will you use to implement the network? Why?

We will use caffe to implement the network because it is easy to train a convolutional network with caffe and we can also implement bash file in terminal conveniently.

What reference materials will you use to obtain sufficient background on applying the chosen network to the specific problem that you selected?

Mostly from papers, websites, video. We will also ask some problems from forums. Like kaggle, github..

How will you judge the performance of the network? What metrics will you use?

We will judge the performance by the loss and accuracy basically. We may also use confusion matrix, ROC curve and calculate the AUC for analyzing the output.

Provide a rough schedule for completing the project.

April 01, 2018 - April 04, 2018	Decide the Dataset, Framework and Network
April 05, 2018 - April 06, 2018	Prepare the data, transform the data into the format that framework wants.
April 07, 2018 - April 09, 2018	preliminary experiment with some simple networks we used before
April 09, 2018 - April 15, 2018	Train different model with different network, parameters and compare their performance
April 16, 2018 - April 19, 2018	Summarize the best model we got
April 20, 2018 - April 24, 2018	Analyze the output of the network, visualize the performance; Write the report and prepare for the presentation