A Convolutional Neural Network Cascade for Face Detection

The face detection system may have some errors for different types of pose, expression, lighting and different types of background. We can overcome this error with the expense of more computational time complexity. Many research occurs in this area focus on uncontrolled face detection like the change of pose, exaggerated expression, and extreme illuminations. But for this factor, the system may robustness but this takes more computational time complexity. This is research the author try to decrease the time complexity by proposing a method.

In this research, the authors propose a CNN based cascade for detecting the face. In this method, they use a multilayer CNN-based cascade. The method has 12-net,12-calibration-net, 24-net, 24-calibration-net, 48-net, and finally 48-calibration-net. After completing 48-calibration-net the final output comes out.

In 12-net the CNN densely scanning the whole with 4-pixel spacing. In this stage, they use 12x12 pixel box size for detecting a face. In this stage, the number of the box is less than the number of boxes of the whole image.

In the 12-calibration-net stage's input is come from 12-net stage boxes. In this stage, they compare the boxes' confidence score with predefined some confidence that comes from predefined some patterns. In this method, they use 45 patterns. In reduce, some boxes come from the 12-net stage. After this stage output is some 24x24 boxes.

In the 24-net stage, input comes from 12-calibration-net with 24x24 pixel box size. It works the same thing occurs in 12-net but it works with 24x24 pixel box size.

In the 24-calibration-net stage, It compares boxes' confidence with confidence calculate from some predefined patterns.

In 48-net and 48-calibration-net work similarly of 12-net and 12-calibration-net. For this stage, output comes from the 24-calibration-net with 48x48 pixel box size.

Our project is emojify. In this project, we need to first detect the faces this paper might be helpful for detecting faces.

Face Recognition: A Convolutional Neural-Network Approach

This research paper is about detecting a face and verify faces whose face is that from a face database where one person has different kinds of the face like wearing glass, facial expression, etc. This is one kind of identity prove system. The identity proving system is a highly demandable system in our society. The authors try to make a system where this system can identify particular people for a security system. Many systems were available this time like graph matching. But this system needs to define a specific graph like noose, eye, mouth. But the authors provide two methods where they do not need to define any graph for this system. For this, they use Self-organizing-map introduced by Kohonen.

In this paper, they first make a local sample from the dataset. For this, a fixed size window step over the whole of the images and this make local sample for the next step. Then they run Self-organizing-map to find out the patterns from the training dataset. They also try the KL method for feature extraction from images. For applying CNN they need to store those data generating from SOM (self-organizing map) and KL method. So they store the output of these two-steps and apply CNN for detecting the face.

In this research method, they use SOM and KL methods. The KL method is based on distance measure so I think this may not give accurate results all time. Again for this, they need a face database where one person needs to have all possible face expressions and facial details. Otherwise, they can not give accurate results.

In our project, this paper may not helpful for us but I think this is helpful only for face detection.