

Project Title

“Age Estimation From Facial Parts Using Compact Multi-Stream Convolutional Neural Networks”

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Introduction

Age is a useful property for classify individuals and it is an biological property that play a key factor in many real world applications like in preventing purchase of alcohol and drug products by minors , human computer interaction, soft biometrics and age synthesis in Forensic Art to find lost people.

Age is related to shape of facial features like eyes, nose, mouth, etc. and their skin pigmentation and wrinkles this aging process influenced by many internal and external factors because of these factors age estimation is very hard for machines.

So in this project we will work on the approach which uses deep learning for age estimation by adopting facial parts as input and compact multi stream CNN as architecture. Here we will use facial landmark coordinates extracted by open source tool boxes to crop and align the images and after this we will resize each part in a way that they have a similar area in pixels and use them to feed our CNN.

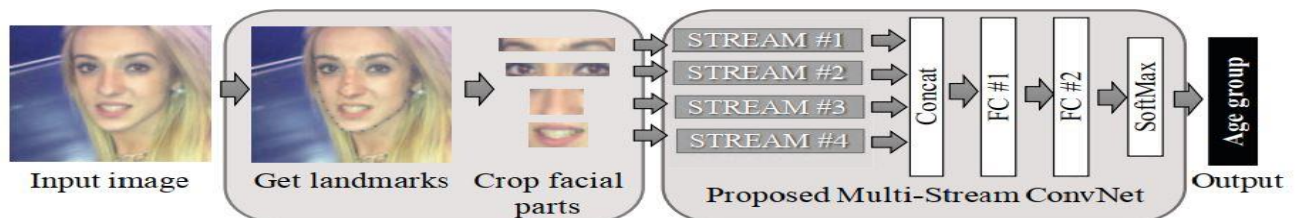
Method

In this approach we will First give a single RGB image as input to the system and a face detector is applied followed by a 2d facial landmarks estimator and then based on landmark coordinates the facial parts are preprocessed and cropped. Each facial part feeds a specific stream of CNN, whose outputs are concatenated and processed by a sequence of fully connected layers. Finally a softmax function returns the probabilities of the person belonging to each age group, so in result person will belongs to highest probability age group.

Preprocessing , Multi-stream CNN and Dataset

Face detection is first step which returns bounding boxes which will used as 2D landmark location for align, crop and resize each facial part and these each part will processed by an independent compact CNN stream prior to concatenation with other parts with dense layers, that means feature learning is done before concatenating each facial part information.

We will work on ADIANCE Dataset which was designed for age gender classification for face images captured in challenging real world conditions. This dataset consists of images automatically uploaded to flicker from smartphones so preprocessing is very important here.



Expected Result and Future work

In above figure is the pipeline of the proposed method for age estimation, which we will present and we are hoping that our work will also achieves slightly better accuracy as mentioned in referred research paper. After completion of this work we can also thing about gender classification by this method.

Reference

1. Marcus de Assis Angeloni, Rodrigo de Freitas Pereira¹, Helio Pedrini, "Age Estimation From Facial Parts Using Compact Multi-Stream Convolutional Neural Networks", In IEEE/CVF International conference on Computer Vision Workshop, Oct 2019.