Facial Emotion Recognition

Problem statement formation

Can a model be trained to effectively recognize emotion in facial expressions, while correctly inferring emotions from a new dataset, as a first step to detecting red flags for depression?

Context

Even before COVID-19, mental illness (such as depression) has been on the rise and there are many possible reasons. As a result, telemedicine has been on the rise exploring many different data sources (such as Fitbit, etc.) to get a more complete picture of mental health.

Specifically, there has been a lot of recent research on images and other data to infer whether or not someone's mental health is at risk, to be used by therapist and others (privacy of course is also a big issue when using such data).

Many studies have used image data from social media posts and using metrics like facial expression, lighting of the picture, number of people in the picture, etc. as an indicator for possible expression.

Criteria for success

The criterion for success is to build a model that predicts facial expressions while avoiding overfitting. The goal is to compare a few models made from scratch with pretrained models.

Scope of solution space

The scope is limited to fer2013 dataset. It is not certain yet how many males, females, nationalities, etc. there are in the dataset, but the more variety the better for generalizing to many different types of facial expressions.

Constraints

The constraints are being limited to this dataset, which seems to be lacking in data since it has about 30,000 samples and needs to be around 10^7 samples for 7 categories (as well as the categories being balanced). This can be remedied by randomly taking samples while transforming images (such as rotation, translation, zooming, etc.)

Stakeholders

- Kevin Ding
- General public

Data sources

Challenges in Representation Learning: Facial Expression Recognition Challenge - https://www.kaggle.com/competitions/challenges-in-representation-learning-facial-expression-recognition-challenge/data