Capstone Project

Facial Emotion Recognition

Context

Deep Learning has found applications in many predictive tasks relating to more unstructured forms of data over the last few years, such as images, text, audio and video. Many of these tasks seem to be in the vein of a larger direction of predictive modeling that aims to match human-level performance on such tasks, because humans have evolved to specialize in performing intelligent actions on such unstructured data. As a specific branch of AI (also called Affective Computing or Emotion AI) Artificial Emotional Intelligence stands for the study and development of technologies and computers that can read human emotions by means of analyzing body gestures, facial expressions, voice tone, etc. and react appropriately to them.

In the field of human-machine interaction, facial expression recognition is critical. From recent research, it has been found that as much as 55% of communication of sentiment takes place through facial expressions and other visual cues. Therefore, training a model to identify facial emotions accurately is an important step towards the development of emotionally intelligent behavior in machines with AI capabilities. Automatic facial expression recognition systems could have many applications, including but not limited to any use case that requires human behavior understanding, detection of mental disorders, and creating a higher quality of virtual assistant for customer-facing businesses.

Objective

The goal of this project is to use Deep Learning and Artificial Intelligence techniques to create a computer vision model that can accurately detect facial emotions. The model should be able to perform multi-class classification on images of facial expressions, to classify the expressions according to the associated emotion.

About the dataset

The data set consists of 3 folders, i.e., **'test'**, **'train'**, and **'validation'**.

Each of these folders has four subfolders:

- **‘happy’:** Images of people who have happy facial expressions.
- **‘sad’:** Images of people with sad or upset facial expressions.
- **‘surprise’:** Images of people who have shocked or surprised facial expressions.
- **‘neutral’**: Images of people showing no prominent emotion in their facial expression at all.