Archetype Expo 2019
Project Report

Project No:- **1**   Title:- **Real-time Emotion Detection using Facial Expressions**

Abstract:

Emotion is a subjective thing, leveraging knowledge and science behind labeled data and extracting the components that constitute it, has been a challenging problem in the industry for many years. With the evolution of deep learning in computer vision, emotion recognition has become a widely-tackled research problem. In this work, we propose an independent method for this very task. This method is an 8-layer convolutional neural network (CNN) and the results show that with more fine-tuning and depth, our DL model can perform with the state-of-the-art methods for emotion recognition. We also propose some exciting ideas for expanding the concept of hybrid convolutions to improve their performance.

Implementation Details:

Programming Language: Python3.7
Dataset Used: FER2013

A face emotion recognition system comprises of two-step process i.e. face detection (bounded face) in image followed by emotion detection on the detected bounded face. The following two techniques are used for respective mentioned tasks in the face recognition system.

1. **Haar feature-based cascade classifiers**: It detects the frontal face in an image well. It is real-time and faster in comparison to other face detectors. This uses an implementation from Open-CV.
2. **DL Model:** A DL(Deep Learning) classification model architecture which takes bounded face (48*48 pixels) as input and predicts probabilities of 7 emotions in the output layer is trained with the dataset available.

In Real-time, the webcam recorded the video and detected the faces in the yellow box and extracted the facial landmarks with red dots. Then the vectors were calculated with red lines.

Student Details

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Education:
M.Tech, University of Hyderabad
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B.Tech, Jawaharlal Nehru Technological University, Hyderabad
71.1%
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Fields of Interest:
Machine Learning
Deep Learning
Computer Vision

Skills:
Languages: C, C#, Java, Python, HTML, JavaScript, SQL
Operating Systems: Windows, Linux
Tools: MS Office, Microsoft Visual Studio, Jupyter Notebook, Pycharm
Master's Thesis(Tentative):
Text-to-Image synthesis using Generative Adversarial Networks.
Currently working on GANs and would further formulate the same as a kind of Reinforcement Learning problem as well.

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Fields of Interest:
Network Security
Cryptanalysis

Skills:
Languages: C, Java, HTML, JavaScript, SQL
Operating Systems: Windows, Linux
Tools: MS Office
Master's Thesis(Tentative):
Light-weight cryptography for the Internet of Things.
Currently working on Simon and Speck Algorithm and to enhance the performance using PERMS bit permutations.