National University

of computer and emerging sciences

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Occluded facial expression detection

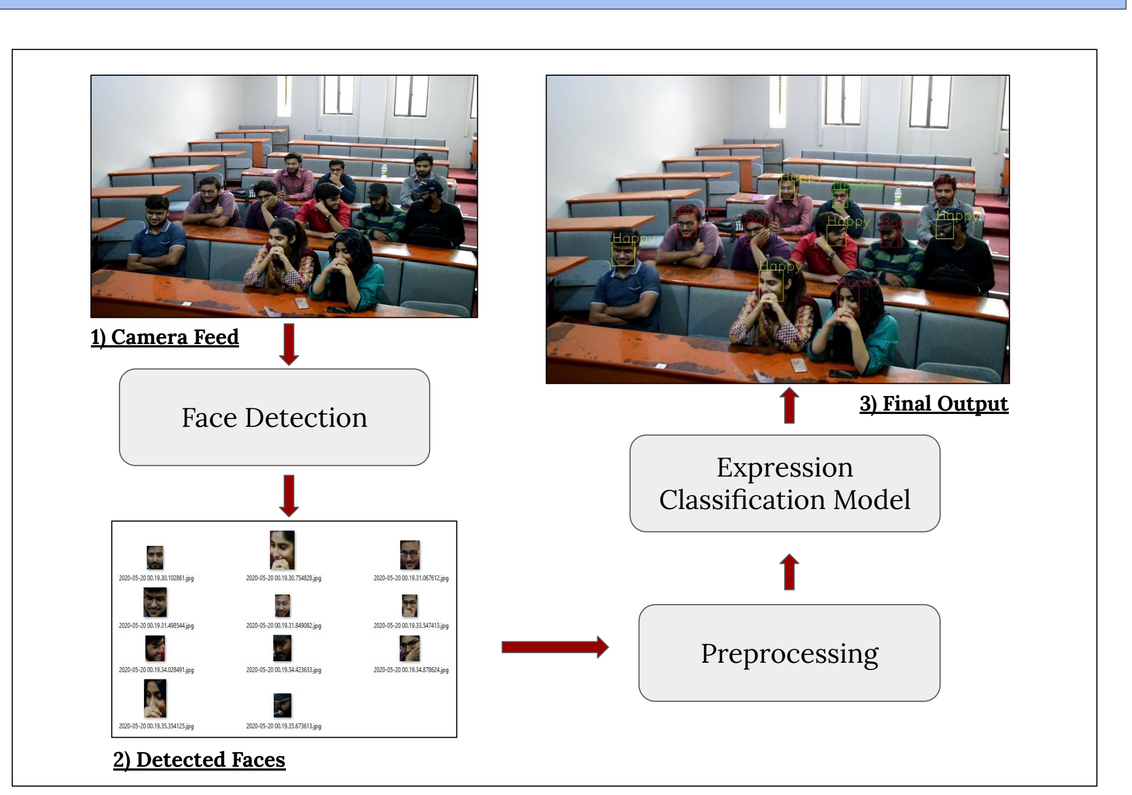
Introduction

Recognizing facial expressions is a challenging task and is a constant attraction for several researchers. Several researches have been performed in order to improve its accuracy. It has many applications and is being used in multiple fields nowadays such as from getting students feedback in classrooms to testing candidate's personality during an interview. The proposed research focuses on detection of occluded/non occluded facial expressions. The target of our research was to find out the best approach to detect and predict the occluded/non occluded facial expressions of multiple humans in sparse crowds.

Objective

1. To investigate a technique of facial expression detection in real time environment.
2. To develop and validate the proposed facial recognition approach on occluded and non occluded students in class rooms.

Proposed Method



The frames are obtained from a camera at an inclined angle. The frames are then fed to face detector which provides us with coordinates of faces. Each face is preprocessed and forwarded into the expression classification model which predicts the facial expressions. For training facial expression models we have used two approaches i.e. scratch and transfer learning approach.

Results

We achieved 66% and 71% accuracy using scratch and transfer learning approach respectively.

Dataset

Dataset used to train facial expression classification models is FER2013 which contains real world images. It was suitable to achieve our objectives.

Conclusion & Future Work

In our proposed approach, the primary objective was to detect occluded facial expression in sparse crowd video. For this purpose, we have selected MTCNN for detecting the occluded faces. It performs well on multiple faces in real time which was our primary objective. After conducting a detailed literature review and performing several experiments, we have concluded that the transfer learning approach is most suitable to achieve our goal. Our future work will be to improve the accuracy of expression classification model.

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