Robust Face Detection using Convolutional Neural Network

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Abstract

Faces epitomize multifaceted dimensional meaningful visual stimuli which is a challenge for face detectors in detecting faces which is not in perfect conditions, a situation which happens often than not in real life, hence difficult developing a model for its recognition computationally. In this study, recognition rate, classification performance, estimation rate and preprocessing, and execution time of facial detection systems are improved. This is supported by the implementation of varied approaches. The face detection aspect is handled by the adaptation of Viola Jones descriptor and down-sampled by the Bessel transform which reduces feature extraction space to augment processing time. Gabor feature extractions were passed afterwards to extract thousands of facial features representing various facial deformation patterns. A deep convolutionary based Ada-boost hypothesis is carried out to select a few out of the many neurons features extracted to augment classification which are later fed into the classifier through a back-propagation algorithm. The convolutional neural network (CNN) make available for partial invariance to translation, rotation, scale, and deformation which extracts uninterruptedly larger features in a hierarchical set of layers. The results of the proposed
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approach were very encouraging and demonstrate superiority when compared with other state-of-the-art techniques.

References

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Index Terms

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Keywords

Deep learning, face detection, convolutional neural network, computer vision, Ada-boost.