

Facial Pose Classification Using Hilbert Space Filling Curve and Multidimensional Scaling

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Abstract : Pose estimation is an important task in computer vision. Though the majority of the existing solutions provide good accuracy results, they are often overly complex and computationally expensive. In this perspective, we propose the use of dimensionality reduction techniques to address the problem of facial pose estimation. Firstly, a face image is converted into one-dimensional time series using Hilbert space filling curve, then the approach converts these time series data to a symbolic representation. Furthermore, a distance matrix is calculated between symbolic series of an input learning dataset of images, to generate classifiers of frontal vs. profile face pose. The proposed method is evaluated with three public datasets. Experimental results have shown that our approach is able to achieve a correct classification rate exceeding 97% with K-NN algorithm.

Keywords : machine learning, pattern recognition, facial pose classification, time series

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020