Face Recognition Using Sparse Fingerprint Classification Algorithm

Abstract

Unconstrained face recognition is still an open problem as the state-of-the-art algorithms have not yet reached high recognition performance in real-world environments. This paper addresses this problem by proposing a new approach called sparse fingerprint classification algorithm (SFCA). In the training phase, for each enrolled subject, a grid of patches is extracted from each subject's face images in order to construct representative dictionaries. In the testing phase, a grid is extracted from the query image and every patch is transformed into a binary sparse representation using the dictionary, creating a fingerprint of the face. The binary coefficients vote for their corresponding classes and the maximum-vote class decides the identity of the query image. Experiments were carried out on seven widely-used face databases. The results demonstrate that when the size of the data set is small or medium (e.g., the number of subjects is not greater than one hundred), SFCA is able to deal with a larger degree of variability in ambient lighting, pose, expression, occlusion, face size, and distance from the camera than other current state-of-the-art algorithms..

Keywords

Dictionaries, Face, Face recognition, Feature extraction, Fingerprint recognition, Training, Lighting.