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Feature-point geometrical face recognition with local invariant features

Yea-Shuan Huang
Huang-Hua University, Taiwan

Face recognition is essential for human to communicate with each other, and due to its importance and applicability, many methods have been proposed in the last three decades. Among various research directions, feature extraction plays an important role because it correlates to the recognition accuracy considerably. However, only a few efforts were devoted to extract the personalized land-mark facial points and further use the geometrical information of them to perform recognition. In this paper, a novel feature-point bilateral recognition (FPBR) method for recognizing human faces is proposed. At first, a set of distinct feature points is extracted from a test image. Then, from every training face image each detected feature point finds its best matched position through a block matching operation. Further, from the detected feature points and their matched ones, two geometrical models for describing their structure relationships are constructed respectively. With a geometrical model comparison design, the difference of the two geometric models is computed. Then, by associating the average matching strength and the difference of geometric models, the score of forward recognition is produced. Similarly, the score of backward recognition can be also produced by just detecting feature points from a training image and locating their individual matched ones from the test image. By summing up the scores of both forward and backward recognition, a bilateral recognition score is obtained and is used to produce the final recognition result. Beside the bilateral recognition, the used feature, called local vector pattern (LVP), will also be introduced which encodes various pairwise directions of vector as a facial descriptor to strengthen the structure of micro patterns. Experiments on the famous FERET face databases show that the proposed algorithm produce an excellent recognition result and performs much better than two other well-known face recognition methods.

Biography

Yea-Shuan Huang completed his Graduation in Computer Science department at Concordia University, Canada, in 1994. He retired from Industrial Technology Research Institute, Taiwan in 2006 and became an Associate Professor of Computer Science and Information Engineering department at Chung-Hua University. His research interests are in the areas of “Face recognition, gesture analysis, biometrics authentication, OCR, image analysis, computer vision, and pattern recognition”.

yeashuan@chu.edu.tw.com

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