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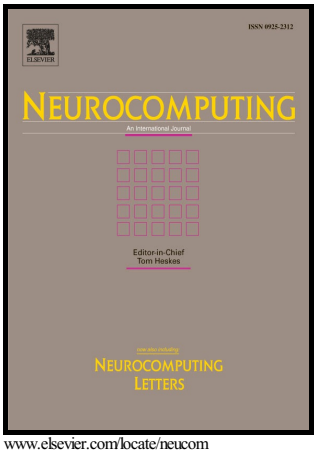

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An Improved Collaborative Representation based Classification with Regularized Least Square (CRC-RLS) Method for Robust Face Recognition

Yu Cheng[1, 2], Zhigang Jin[3], Tao Gao[14,5], Hongcai Chen[6,7], Nikola Kasabov[8]

[1]School of Computer, Science and Technology, Tianjin University, Tianjin, China

[2]Institute of Applied Mathematics, Hebei Academy of Sciences, Shijiazhuang, China,

[3]School of Electronic Information Engineering, Tianjin University, Tianjin, China,

[4]Department of Automation,North China Electric Power University, Baoding 071003, Hebei Province, China

[5]Knowledge Engineering and Discovery Research Institute, Auckland University of Technology, Auckland 1010, New Zealand

[6]Institute of Applied Mathematics, Hebei Academy of Sciences, Shijiazhuang, China

[7]Hebei Authentication Technology Engineering Research Center, Shijiazhuang, China

[8]Knowledge Engineering and Discovery Research Institute, Auckland University of Technology, Auckland 1010, New Zealand

chengyu@heb-math.org

zgjin@tju.edu.cn

Gaotao366@163.com

chenhongcai@heb-math.org

nkasabov@aut.ac.nz

Accepted manuscript

Abstract

Fast and robust face recognition is a challenging research topic in the field of computer vision. A recently proposed Collaborative Representation based Classification with Regularized Least Square（CRC-RLS） algorithm shows very lower computational cost but with poor robustness. In order to solve this problem, we propose an improved CRC-RLS method. Firstly, the image Gabor features were extracted and used to construct initial dictionary. Secondly, we learn a discriminative dictionary by a label consistent K-SVD (LC-KSVD) method which combines the sparse coding error with the reconstruction error and the classification error. Finally, l_2-norm of coding residual in CRC-RLS is computed and the classification problem is transformed into solving linear programing problem. Experiments on two benchmark face databases with variations of illumination, expression, occlusion show that the proposed method can achieve high classification accuracy and has a very low time-consuming.

Keywords- face recognition; Gabor wavelet; dictionary learning; K-SVD, collaborative representation

[1] Contact Author

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