

Accepted Manuscript

Expression-Targeted Feature Learning for Effective Facial Expression Recognition

Ying Huang, Yan Yan, Si Chen, Hanzi Wang

PII: S1047-3203(18)30189-5

DOI: <https://doi.org/10.1016/j.jvcir.2018.08.002>

Reference: YJVC I 2251

To appear in: *J. Vis. Commun. Image R.*



Please cite this article as: Y. Huang, Y. Yan, S. Chen, H. Wang, Expression-Targeted Feature Learning for Effective Facial Expression Recognition, *J. Vis. Commun. Image R.* (2018), doi: <https://doi.org/10.1016/j.jvcir.2018.08.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Expression-Targeted Feature Learning for Effective Facial Expression Recognition

Ying Huang ^a, Yan Yan ^{a*}, Si Chen ^b, Hanzi Wang ^a

^a Fujian Key Laboratory of Sensing and Computing for Smart City, School of Information Science and Engineering, Xiamen University, Fujian, China

^b School of Computer and Information Engineering, Xiamen University of Technology, Fujian, China

Abstract

In this paper, we propose a novel expression-targeted feature learning (ETFL) method for effective facial expression recognition, which takes advantage of multi-task learning for discriminative feature learning. Specifically, the common features are firstly extracted from the lower layers of CNN. Then, based on the common features, the expression-specific features (ESF) are respectively learned for each facial expression via multi-task learning. In order to enhance the discriminability of ESF, we develop a joint loss (the combination of the center loss and a novel inter-class loss) to explicitly reduce intra-class variations while enlarging inter-class differences. Furthermore, we introduce the sample-sensitive weights and the soft-expression weights to balance the joint loss for better performance. Finally, all ESFs are combined for final classification. ETFL effectively exploits the relationship among all facial expressions, which leads to superiority feature discriminability. Experiments on public facial expression databases demonstrate the effectiveness of ETFL compared with several state-of-the-art methods.

Keywords: Facial expression recognition, Multi-task learning, Feature learning, Convolutional neural network

EDICS Category: 5.6: expression, age and gender expression

*Corresponding author. Tel.: +86-592-2580063; fax: +86-592-2580063.
E-mail addresses: yanyan@xmu.edu.cn

Download English Version:

<https://daneshyari.com/en/article/6938180>

Download Persian Version:

<https://daneshyari.com/article/6938180>

[Daneshyari.com](https://daneshyari.com)