Discriminative Center Loss for Face Photo-Sketch Recognition

lin cao

Beijing Information Science and Technology University

xibao huo

Beijing Information Science and Technology University

yanan guo (✉ yananguo@bistu.edu.cn)

Beijing Information Science and Technology University

yuying shao

Beijing Information and Technology University

kangning du

Beijing Information Science and Technology University

Research

Keywords: face photo-sketch recognition, convolutional neural network, Mahalanobis distances

Posted Date: October 13th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-89691/v1>

License: This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Face photo-sketch recognition refers to the process of matching sketches to photos. Recently, there has been a growing interest in using a convolutional neural network to learn discriminatively deep features. However, due to the large domain discrepancy and the high cost of acquiring sketches, the discriminative power of the deeply learned features will be inevitably reduced. In this paper, we propose a discriminative center loss to learn domain invariant features for face photo-sketch recognition. Specifically, two Mahalanobis distance matrices are proposed to enhance the intra-class compactness during inter-class separability. Moreover, a regularization technique is adopted on the Mahalanobis matrices to alleviate the small sample problem. Extensive experimental results on the e-PRIP dataset verified the effectiveness of the proposed discriminative center loss.

Full Text

This preprint is available for [download as a PDF](#).

Figures

Figure 1

Different sketch-photo pairs from (a) the CUHK [12], (b) the PRIP-HDC [8], and (c) the e-PRIP [13] datasets.

Figure 2

Resnet module

Figure 3

Figure 4

CMC curves of the three different loss functions on the S1 setup

Figure 5

The effect of different loss functions on the S2 setup. The first two lines show the results of ours, the second two lines depicts the result of center loss, and the third two lines depicts the result of softmax loss.