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Feedback Weight Convolutional Neural Network for Gait Recognition

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Abstract

Gait recognition is an important issue currently. In this paper, we propose to combine deep features and hand-crafted representations into a globally trainable deep model. Specifically, a set of deep feature vectors are firstly extracted by a pre-trained CNN model from the input sequences. Then, a kernel function with respect to the fully connected vector is trained as the guiding weight of the respective receptive fields of the input sequences. Therefore, the hand-crafted features are extracted based on the guiding weight. Finally, the hand-crafted features and the deep features are combined into a unified deep network to complete classification. The optimized gait descriptor, termed as deep convolutional location weight descriptor (DLWD), is capable of effectively revealing the importance of different body parts to gait recognition accuracy. Experiments on two gait data sets (i.e., CASIA-B, OU-ISIR) show that our method outperforms the other existing methods for gait recognition.

Keywords: gait recognition; deep learning; convolutional neural network; weighted receptive field

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