1. A dual-network micro-expression recognition model based on optical flow features

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Abstract: Human micro-expressions are difficult to detect, and their duration is approximately 1/25 to 1/5 s. Recognition and research on micro-expression can help determine the real psy-chological state of human beings, and the application scenarios are very wide. In this research, in addition to computer vision knowledge, a deep convolutional neural network for detecting facial key points and a deep learning method for extracting optical flow features were combined to construct a dual-network micro-expression recognition model based on optical flow features. The facial region of interest was divided in accordance with the key points of the face, and the optical flow features in the regions of interest were statistically analyzed. Because the original optical flow features contained in the micro-expression video clips have many dimension and high redundancy, an improved optical flow direction histogram was adopted. The histogram of oriented optical flow removed redundant features and enhanced the ability of optical flow features to describe micro-expression. Finally, the classification algorithm of the support vector machine was used to realize micro-expression recognition. The experimental results on the video-based facial micro-macro-expression database MMEW showed that the dual-network model constructed here improved the accuracy of micro-expression recognition and better completed the task of micro-expression recognition. © 2022 IEEE.

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