An MrPPG Method for Face Anti-Spoofing

Authors : Lan Zhang, Cailing Zhang

Abstract : In recent years, many face anti-spoofing algorithms have high detection accuracy when detecting 2D face anti-spoofing or 3D mask face anti-spoofing alone in the field of face anti-spoofing, but their detection performance is greatly reduced in multidimensional and cross-datasets tests. The rPPG method used for face anti-spoofing uses the unique vital information of real face to judge real faces and face anti-spoofing, so rPPG method has strong stability compared with other methods, but its detection rate of 2D face anti-spoofing needs to be improved. Therefore, in this paper, we improve an rPPG(Remote Photoplethysmography) method(MrPPG) for face anti-spoofing which through color space fusion, using the correlation of pulse signals between real face regions and background regions, and introducing the cyclic neural network (LSTM) method to improve accuracy in 2D face anti-spoofing. Meanwhile, the MrPPG also has high accuracy and good stability in face anti-spoofing of multi-dimensional and cross-data datasets. The improved method was validated on Replay-Attack, CASIA-FASD, Siw and HKBU_MARs_V2 datasets, the experimental results show that the performance and stability of the improved algorithm proposed in this paper is superior to many advanced algorithms.

Keywords : face anti-spoofing, face presentation attack detection, remote photoplethysmography, MrPPG
Conference Title : ICDAR 2022 : International Conference on Document Analysis and Recognition
Conference Location : Bali, Indonesia
Conference Dates : January 14-15, 2022