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Exploring Finger Vein Based Personal Authentication for Secure IoT

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Abstract: *Personal authentication is getting harder and harder in the internet of things (IoT). Existing methods used for personal authentication, such as passwords and the two-factor authentication (2FA), are inadequate and ineffective due to human error and other attacks. To support more secure IoT, this paper proposes a finger vein based personal authentication method by exploring competitive orientations and magnitudes from finger vein images. Finger vein recognition has been proven to be a reliable and promising solution for biometric-based personal authentication. The stable and rich piecewise line features in finger vein images can be used to clearly represent finger vein patterns for personal authentication. In this paper, we propose an efficient local descriptor for finger vein feature extraction, namely the histogram of competitive orientations and magnitudes (HCOM). For a finger vein image, two types of local histograms are extracted and fused together to efficiently and adequately represent the competitive information: the histogram of competitive orientations (HCO) and the local binary pattern histogram generated from the image of competitive magnitudes (named as HCMLBP). The extensive experimental results from the application of the proposed method to the public finger vein database MMCBNU_6000, demonstrate that the proposed method outperforms state-of-the-art orientation coding (OC)-based methods and other commonly used local descriptors. Additionally, the*

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