

Low-Cost Embedded Biometric System Based on Fingervein Modality

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Abstract : Fingervein biometric authentication is one of the most popular and accurate technologies. However, low cost embedded solution is still an open problem. In this paper, a real-time implementation of fingervein recognition process embedded in Raspberry-Pi has been proposed. The use of Raspberry-Pi reduces overall system cost and size while allowing an easy user interface. Implementation of a target technology has guided to opt some specific parallel and simple processing algorithms. In the proposed system, we use four structural directional kernel elements for filtering finger vein images. Then, a Top-Hat and Bottom-Hat kernel filters are used to enhance the visibility and the appearance of venous images. For feature extraction step, a simple Local Directional Code (LDC) descriptor is applied. The proposed system presents an Error Equal Rate (EER) and Identification Rate (IR), respectively, equal to 0.02 and 98%. Furthermore, experimental results show that real-time operations have good performance.

Keywords : biometric, Bottom-Hat, Fingervein, LDC, Raspberry-Pi, ROI, Top-Hat

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