Palm vein pattern visual interpretation using laplacian and frangi-based filter

ABSTRACT

Detection of palm vein pattern through image processing techniques is an open problem as performance of each technique is closely related to the sample image gathered for the processing. The detected palm vein pattern is useful for further analysis in biometrics application and medical purpose. This paper aims to investigate the application of Laplacian filter and Frangi-based filter in detecting vein pattern contained in a near infrared illuminated palm image. Both filtering techniques are applied independently to two palm image databases to compare their performance in translating vein pattern in the image visually. Through empirical study, it is observed that Laplacian filter can translate the vein pattern in the image effectively. But pre-processings involved before the application of Laplacian filter need to be performed to accurately translate the vein pattern. The implementation of Frangi-based filter, while simplifying the detection process without the need of extra pre-processing, resulted in only certain vein pattern detected. Using pixel-by-pixel objective assessment, the rate for Laplacian filter in detecting vein pattern are generally more than 85% compared to Frangi-based filter; where it ranges from 60% to 100%.