Enhancement of Finger Print Image using Fuzzy Filter

Abstract

Fingerprint recognition is the most widely used biometric system for human identification. The noise is one kind of feature which disturbs the real finger print pattern and makes the identification process is not efficient. Therefore we need to eliminate the noise, and recover the original finger print from noises. In order to recover the original finger print, finger print image needs to be pre-processed. Pre-processing is a method of eliminating or reducing the noise presents in the finger prints. There are various techniques pre processing such as binarization, normalization, thinning. Another technique of pre-processing is the use of various filters. These filters are efficient and are also available to reduce noise. Enhancing Finger print is the method of improving the quality of the image by increasing contrast, brightness, sharpness etc. Finger Print Image is enhanced using various filters such as mean and median filters.
to avoid disadvantages of existing filters fuzzy filter is proposed in which the general idea behind the filter is to average a pixel using other pixel values from its neighbourhood, but simultaneously to take care of important image structures like edges. The key idea behind the proposed filter is to distinguish between local variations due to noise and due to image structure. To achieve this, derivative a value that expresses the degree in which the derivative in a certain direction is small is determined for each direction corresponding to the neighbouring pixels of the processed pixel by a fuzzy rule.

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