

## Iris Recognition Based on the Low Order Norms of Gradient Components

**Authors :** Iman A. Saad, Loay E. George

**Abstract :** Iris pattern is an important biological feature of human body; it becomes very hot topic in both research and practical applications. In this paper, an algorithm is proposed for iris recognition and a simple, efficient and fast method is introduced to extract a set of discriminatory features using first order gradient operator applied on grayscale images. The gradient based features are robust, up to certain extents, against the variations may occur in contrast or brightness of iris image samples; the variations are mostly occur due lightening differences and camera changes. At first, the iris region is located, after that it is remapped to a rectangular area of size 360x60 pixels. Also, a new method is proposed for detecting eyelash and eyelid points; it depends on making image statistical analysis, to mark the eyelash and eyelid as a noise points. In order to cover the features localization (variation), the rectangular iris image is partitioned into N overlapped sub-images (blocks); then from each block a set of different average directional gradient densities values is calculated to be used as texture features vector. The applied gradient operators are taken along the horizontal, vertical and diagonal directions. The low order norms of gradient components were used to establish the feature vector. Euclidean distance based classifier was used as a matching metric for determining the degree of similarity between the features vector extracted from the tested iris image and template features vectors stored in the database. Experimental tests were performed using 2639 iris images from CASIA V4-Interval database, the attained recognition accuracy has reached up to 99.92%.

**Keywords :** iris recognition, contrast stretching, gradient features, texture features, Euclidean metric

**Conference Title :** ICSRD 2020 : International Conference on Scientific Research and Development

**Conference Location :** Chicago, United States

**Conference Dates :** December 12-13, 2020