Proposed Threshold Algorithm for Accurate Segmentation for Skin Lesion

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ABSTRACT

Automated diagnosis of skin cancer can be easily achieved only by effective segmentation of skin lesion. But this is a highly challenging task due to the presence of intensity variations in the images of skin lesions. The authors here, have presented a histogram analysis based fuzzy C mean threshold technique to overcome the drawbacks. This not only reduces the computational complexity but also unifies advantages of soft and hard threshold algorithms. Calculation of threshold values even the presence of abrupt intensity variations is simplified. Segmentation of skin lesions is easily achieved, in a more efficient way in the following algorithm. The experimental verification here is done on a large set of skin lesion images containing every possible artifacts which highly contributes to reversed segmentation outputs. This algorithm efficiency was measured based on a comparison with other prominent threshold methods. This approach has performed reasonably well and can be implemented in the expert skin cancer diagnostic systems.

Keywords: Fuzzy C Mean, Histogram, Otsus, Segmentation, Threshold

1. INTRODUCTION

Image segmentation of an image is one of the most important and difficult task. The threshold is one of the most commonly used method for segmentation, it can also be used as the starting step for other segmentation methods. Classic segmentation algorithm class is a good time legible. However, in many real-life situations, such as image segmentation of skin cancer, which is very hard to partition. Maintaining structural details of the diagnosis of skin cancer is important, because the lesion boundary provides information about the degree of asymmetry and steep are the details of a melanoma and benign lesions is important to distinguish between the functions.

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Classic threshold scheme (Glasbey, 1993) distributes pixel clearly and in the region between the pixels may not be distinguished, even if their gray scale values are different in the original image. Therefore, the use of the structural details of the loss of a simple hard thresholding scheme, such as may result from such a simple hard threshold method does not seem to be good choice for lesion segmentation. Replace conventional deterministic samples assigned to a class, the fuzzy division strategy (Aja-Fernandez, Vegas-Sanchez-Ferrero, & Fernandez, 2010) classes provided, wherein each sample point is assigned a soft description in the algorithm, with a given members of each class. Such partitioning reflects the identity of the sample, and thereby retains the structural details of the original data set. Identity is stored in the pixel blur partition space, since the distribution to members of the pixel depends on the difference between its grayscale value and the average gradation value of an area between it belongs.

Natural extension of fuzzy clustering segmentation considered separately as gray value features, resulting in the development of the threshold (Cheng & Chen, 1999). FCM (Fuzzy C-means) currently exist in the literature implement threshold (Fuzzy C-means) are mainly two main ways. The first is an extreme search for all possible threshold, while the second is based on a recognition by iterative evaluation of the optimal combination of standard features, and updates the threshold value. Two iterative and non-iterative implementation on the prospects (Jawahar, Biswas, & Ray, 2000) proposed a look at support efficient execution iteration, as long as it converges.

Pixel classification problem is formulated as a very suitable clustering problem. Traditional valley search options threshold required to provide the optimal threshold on Pattern Recognition sense. Classical deterministic optimal partition does not reflect the geometry of the intensity distribution, but this limitation is to take care of a fuzzy environment. Experimental details are discussed and validated the importance of fuzzy threshold scheme based on fuzzy clustering. Generally, however, the benefit is limited to an image analysis method to extract an object from one scene to a set of features characterizing objects. Even a vague description of the threshold would be sufficient for this purpose, the traditional feature extraction and object recognition methods may not be applicable to this specification as an example. Thus, although based fuzzy threshold (or above) describe the development of elegant image analysis techniques exist, hardening schemes require description can be used to make a conventional object recognition program. Some details of the hardening process, can be found in Jawahar et al. (2000) and Sezgin and Sankur (2004) in the literature. Close attention to the soft and hard threshold scheme different strengths, we are here, we propose a method based on the integration of these two types of threshold algorithm.

The main objective of this paper is to provide the major difference between this algorithm is popular in its implementation and iterative formula. Many iterative optimization algorithm instead, to an extensive search to identify the global maximum or minimum value associated with the target. Function. The proposed algorithm reduces the computational burden threshold selection basis using the histogram analysis done by means clustering fuzzy C. Compared to the same as reported in the literature Otsu method (Jung & Jinglu, 2008), the minimum error threshold (Morii, 1991), the minimum cross-entropy algorithm as hard algorithm will be discussed in the next section provides a better segmentation of lesions (El-Zaart et al., 2008) and keep Tsai (1985) and Kapoor entropy-based (Kapur, Sahoo, & Wong, 1985) as well as conventional soft threshold based on fuzzy C-means clustering.

This paper is organized in the following format: Section 2 has the proposed algorithm and all details. Section 3 provides experimental results and discusses the performance and evaluation. The overall remarks are concluded at the end.
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