ISSN 2515-8260 Volume 07, Issue 09, 2020

WATERSHED ALGORITHM IN MULTICHANNEL FOR SKIN LESION SEGMENTATION

V. Shanthi[1], G. Sridevi[2], R. Charanya[3], J. Josphin Mary[4]

[1]Professor, Faculties of Humanities Science, Meenakashi Academy of Higher Education Research Chennai, TamilNadu, India

[2,3,4]Assistant Professor, Faculties of Humanities Science, Meenakashi Academy of Higher Education Research Chennai, TamilNadu, India

E-mail: principal@maherfhs.ac.in[1], sridevig@maherfhs.ac.in[2], charanyar@maherfhs.ac.in[3], josphinmaryj@maherfhs.ac.in[4]

Abstract:

The abnormal growth of skin cells is skin cancer. Early skin cancer diagnosis is important. The dermoscopic images of the watershed algorithm are presented for the detection of skin cancer. The Gaussian philtre eliminates unnecessary areas of the skin. Then normal and abnormal pictures of the pre-processed skin cancer segment are provided to the water-shifting algorithm. The findings demonstrate the efficacy of a method for classifying skin cancer using a watershed algorithm.

Keywords: Skin cancer detection, Gaussian filter, Segmentation, Watershed algorithm

Introduction:

Detection of SVM and snake code for skin cancer [1]. Color variation and diameter are common techniques for the analysis of cancer characteristics, including asymmetry, border irregularity, compact index, fractal dimension, bordal abrasion, color variation and diameter.Geometric skin lesion study of the visual diagnosis of skin cancer [2]. The loaded parameters are in particular field, perimeter, index of circularity, larger and smallest diameter, index of irregularities and equivalent diameter.

The dermoscopic images are described by the Bayesian classifier. Entropy PAL MCET Skin Cancer Segmentation in Gaussian [3]. Detection and diagnosis of melanoma skin cancer with a vector enabling system [4]. The phases are the collection, pre-processing, segmentation of thresholds and statistical extraction of functions. NSCT features and Bayes classification Melanoma image rating system [5]. The approximation of the image in a smooth contour at different decomposition rates is possible.

Using multiwavelet transformation and vector support equipment, melanoma classification is done in [6-7]. MWT is decomposed of pre-processed melanoma images. Coefficients of MWT subband, normal differences and variance are derived.

Watershed algorithm in multichannel for skin lesion segmentation is presented in this study. The paper organisation is: Section 2 details the processes and materials used for the

framework proposed. The experimental results and discussion of the proposed method are discussed in section 3. The final segment ends with the method suggested.

Methods and Materials:

Initially, the skin images are given to Gaussian filter to remove hairs and unwanted areas. Then the pre-processed image is given to watershed algorithm for segmentation. Figure 1 shows the segmentation of skin cancer workflow.

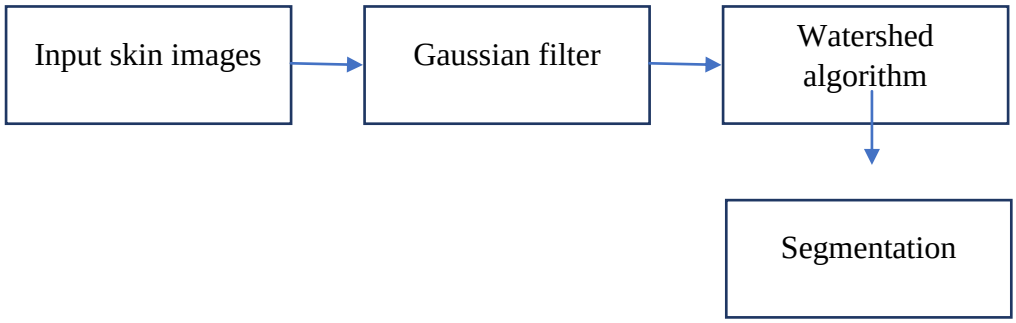


Figure 1 Skin lesion segmentation

Gaussian Filter:

The properties of gaussian filters are to not exceed one phase function input and to reduce the time of rise and fall. This behaviour is closely linked to the fact that the Gaussian filter has a potential group delay [8].A linear filter is a Gaussian filter. The image is normally broken or noise reduced. Only the Gaussian filter blurs edges and reduces contrast. Figure 2 shows the work flow of Gaussian filter.

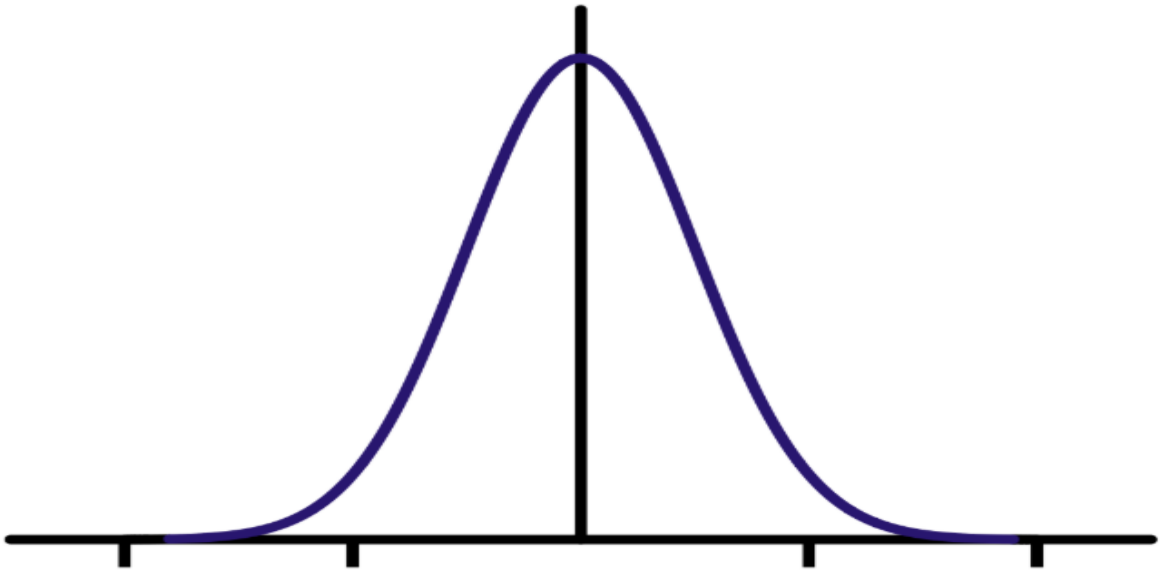


Figure 2 Gaussian filter workflow

The regular Gaussian time or space philtre is a low-pass philtre. The weighted average in its neighbourhood replaces any input signal element. This induces time-space blurring, as do high frequency components in the frequency field. This results in blurring.

Applying a Gaussian blur to an image mathematically means the image to be transformed into a Gaussian image. As Gaussian Fourier is another Gaussian transformer,

applying Gaussian blur eliminates high-frequency image components and thus renders a Gaussian blur a low-pass filter.

Watershed Segmentation:

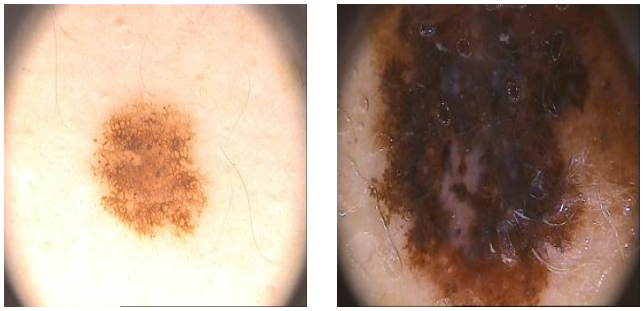
A transformation is defined on a gray image in the study of image processing. The name refers to a natural watershed or drainage separating adjacent drainage basins. He treats the picture on which it functions as a topographic map with the lights and the lines running along tops of the crises, as well as the lights of each watershed transformation. A river has numerous technical meanings. On the nodes, edges or hybrid lines on both nodes and borders watershed lines can be described in graphs. In the continuous domain, watersheds may also be defined. Watershed algorithm, a morphological mathematics tool for regionally-based image segmentation, has many advantages. The effect is regional segmentation, border closure and high precision. It can be connected, closed, and accurately designated for one pixel long. Figure 3 shows the watershed algorithm.

Figure 3Watershed algorithm

The algorithm functions on a grey image. Watersheds with adjacent catchment basins are established during a successive flood of the grey value relief. This flooding is done in the gradient image, the basins should appear along the edges. The basic concept was to minimise the amount of water available in each area to a minimum, to flood the entire landfill from sources and to create obstacles where various water sources met. The resulting collection of barriers is a flood-shift. Since then, this algorithm has been strengthened by a variety of items called Priority-Flood.

Results and Discussion:

The performance of skin lesion segmentation is evaluated by skin lesion images. The abnormal and normal skin image is shown in figure 4.



(a) Normal image **(b) Abnormal image**

Figure 4Sample images

The input skin images are given to Gaussian filter for noise removal. Then the pre-processed image is given to watershed algorithm for segmentation. Figure 4 shows the efficiency of the framework proposed.

Figure 5Performance of proposed system

Conclusion:

In this study, watershed algorithm Dermoscopic images for the classification of skin cancer are presented in section. The input skin images are given to Gaussian filter is used for noise reduction. Then the watershed algorithm is used for segmentation of skin images. Each image is segmented by the watershed algorithm in the segmented image. The experimental results show the performance of the skin cancer detection.

Reference:

[1] Bumrungkun, P., Chamnongthai, K., &Patchoo, W. (2018, January). Detection skin cancer using SVM and snake model. In 2018 International Workshop on Advanced Image Technology (IWAIT) (pp. 1-4). IEEE.

[2] Zreika, N. A., El Zaart, A., El Chakik, A., & El Arwadi, T. (2018, September). Skin Cancer Segmentation with Entropy PAL MCET using Gaussian Distribution. In 2018 4th International Conference on Applied and Theoretical Computing and Communication Technology (iCATccT) (pp. 315-320). IEEE.

[3] Sonia, R. (2016). Melanoma image classification system by NSCT features and Bayes classification. International Journal of Advances in Signal and Image Sciences, 2(2), 27-33.

[4] Kumarapandian, S. (2018). Melanoma Classification Using Multiwavelet Transform and Support Vector Machine. International Journal of MC Square Scientific Research, 10(3), 01-07.

[5] Ranganathan, S. (2019). Rain removal in the images using bilateral filter. International Journal of MC Square Scientific Research, 11(1), 9-14.

[6] Shekaina Justin, & Manjula Pattnaik. (2020). Skin Lesion Segmentation by Pixel by Pixel Approach Using Deep Learning. International Journal Of Advances In Signal And Image Sciences, 6(1), 12-20.

[7] R. Prasath & T. Kumanan (2019) , Department of CSE, Meenakshi Academic of Higher Education and Research, Chennai, India, Distance-Oriented Cuckoo Search

enabled optimal histogram for underwater image enhancement: a novel quality metric analysis, The Imaging Science Journal, 67:2, 76-89.

[8] Vijayabaskar, Kumanan T. (2020) Department of CSE, Meenakshi Academic of Higher Education and Research, Chennai, India, Link Quality and Energy-Aware Metric-Based Routing Strategy in WSNS. In: Solanki V., Hoang M., Lu Z., Pattnaik P. (eds) Intelligent Computing in Engineering. Advances in Intelligent Systems and Computing, vol 1125. Springer, Singapore.