

Binary Image Processing for Computation of Connected Components, Image Holes, Euler Number Using Graph Theory



Prasuna Reddy Salepela, Sravya Sabbu, Sruthi Vaidyula and Yamini Hanisha Talluri
1100 South Marietta Pkwy SE, Marietta Campus, Marietta, GA - 30060

Abstract Introduction

A binary image is important for recognizing patterns in image processing. Segmentation permits label that each pixel is "surrounding item" that is assigned as black and white shades. Binary image processing is merged with artificial intelligence to get a "computer-aided diagnosis, handwriting and image recognition". A binary image is consisting of two pixels mainly black and white, colour pixel is called monochromatic a "threshold from a grey level". Thresholding is a method by which one can get a binary image. Euler number is defined as the total number of objects in an image subtracted by the total number of holes in that image know as "topology of an image".

Introduction

A binary image is important for recognizing patterns in image processing. It consisting of two pixels mainly black and white.

Euler number is defined as the total number of objects in an image subtracted by the total number of holes in that image.

Research Question(s)

1. Enhancing images aims to give a better quality of image that is generally not given by any imaging system.
2. Main aim is to find the frequencies of all the given keywords
3. Recommended the ML algorithm to improve accuracy in pixels recognition.

Research Question(s)

• Performing task is by linear quad-trees, wide application in pattern recognition on various levels for implementing technique. The number of holes can be determined by "using polygon sets of digitalization". This transforms a string of character, symbols into image processing methods.

•Example

Converts the original image as binary image using edges, pixels upon recognition every vertices clearly.



Results

• A binary image is analyzed by using typically taking 0 and 1. 0 represent background and 1 represent foreground. This can be manufactured for three dimensional. This processing technique can make many changes in binary processing. There is three level in the fitting model of analyzing technique that is low-level, intermediate-level and high-level processing.

• This can also have capacity to capture higher dimensions in their property. This has a wide application in "CT scanning, astronomy, and radar imaging". Image transformation is another name for intermediate level. This method is used to transform mapping images into Wavelet transform. This cannot be accessed into spatial domain as explained in a two-dimensional image.

• Features of both extraction and dimensionality reduction for many uses in a binary image. This feature can be used to decrease from one dimension to another dimension. The normal digital technique requires 8 bits for performing its coding. But when this is implemented for the Digital technique one can use only 1 to 2 bits for image reframing (Weinstein, 2020).

• After splitting, the images contained by the dataset have been resized and reshaped for the feature extraction process of deep learning. The images have been resized and reshaped in the same size necessarily; otherwise, the convolution operation cannot be performed efficiently. At the same time, it is required to be mentioned importantly, that all the pixel intensities have been divided by 255 to make the intensity values 0 to 1.

• In generally works for fragmentation of pixels from object to background. Pattern recognition computer graphics can be regarded as inverse in nature. This transforms a string of character and symbols into image processing methods. "The unprocessed pixels in the line below are left as it is for reconciliation while processing the next line".

• There are many differences and similarities in computer graphics, image processing and pattern recognition in computer programming. All the levels have a wide application in structure designing also in modern application.

• This helps us to analysis different system that can run to redefined world model. This world model can incorporate to give important data as possible. Pattern recognizing is also another method that can be used to implement modern technique for developing various human recognition techniques.

• Then a sequential model has been created and convolution has been performed with the help of 28 different 3 X 3 filters. Finally, we need to perform the max pooling, and then build and summarized.

•Resources:

• Books - Dougherty, E.R., 2020. Digital image processing methods. CRC Press. HQ: USA.

Conclusions

This method is beneficial for human recognition for machines to learn their language and behaviour. This image processing is helpful for the easy disjunction of an item from its surroundings. The accuracy of using this binary imaging process can increase the efficiency of the image recognition technique.

Thresholding is a method by which one can get a binary image. Euler number is defined as the total number of objects in an image subtracted by a total number of holes in that image.

The pixel used in this binary image can be converted into required density and disparity.

Literature Cited

- Affonso, C., Rossi, A.L.D., Vieira, F.H.A. and de Leon Ferreira, A.C.P., 2017. Deep learning for biological image classification. Expert Systems with Applications, 85, pp.114-122.
- Cho, Y.B. and Woo, S.H., 2018. Algorithm for Extract Region of Interest Using Fast Binary Image Processing. Journal of the Korea Institute of Information and Communication Engineering, 22(4), pp.634-640.
- Huang, W., Huang, Y., Wang, H., Liu, Y. and Shim, H.J., 2020. Local binary patterns and superpixel-based multiple kernels for hyperspectral image classification. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 13, pp.4550-4563.

Acknowledgments

IEEE paper:
<https://ieeexplore.ieee.org/document/8529550>

Contact Information

© Copyright 2021. To contact authors, email id's -
psalepel@students.kennesaw.edu,
ssabbu@students.kennesaw.edu,
svaidyul@students.kennesaw.edu,
ytalluri@students.kennesaw.edu