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INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)

Vol. 02, Issue 05, May 2022, pp : 323-325

e-ISSN : 2583-1062

Impact Factor : 2.205

SINGLE PRE-PROCESSING VERSE DOUBLE PRE-PROCESSING FOR SEGMENTATION

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ABSTRACT

The process of processing digital images using various pre-processor methods is known as digital image processing. We employ a two-step pre-processing method in this paper, then apply a segmentation process to the digital image. In which case the direct segmentation approach yields a superior outcome. We use a pre-processor method of contrast stretching to the digital image first and then we apply the edge detection method's segmentation. Another example uses two pre-processors: contrast stretching and histogram equalization, followed by edge segmentation. This study provides a high-level overview of digital picture segmentation and pre-processing.

Keywords: Pre-processing, Segmentation, histogram equalization, contrast stretching, edge detection**.**

1. INTRODUCTION

Digital image processing is one of the fastest-growing fields of technology. Picture processing is a technique for applying operations on an image in order to improve it or extract relevant information from it. Computers are used to manipulate digital photographs utilizing digital image processing techniques. The term "image pre-processing" refers to actions on images at the most basic level. The goal of pre-processing is to improve image data by suppressing unwanted distortions or enhancing particular visual properties that are important for subsequent processing and analysis. The technique of partitioning a digital image into several image segments, also known as image regions or image objects, is known as image segmentation (sets of pixels).

The purpose of segmentation is to make an image more intelligible and easier to evaluate by simplifying or changing its representation. Objects and boundaries (lines, curves, etc.) in images are often located via image segmentation.

2. METHODOLOGY

2.1 Pre-processing

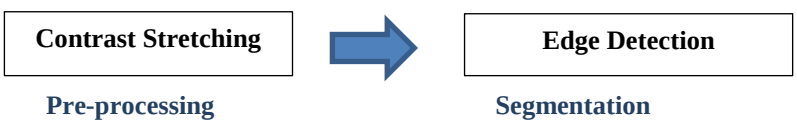
Pre-processing is a term used to describe operations on images at the most basic level of abstraction, where both the input and output are intensity images. These iconic images are identical to the sensor's original data, with an intensity image often represented by a matrix of image function values (brightnesses). Although geometric transformations of images (e.g. rotation, scaling, translation) are classified among pre-processing methods here because similar techniques are used, the goal of pre-processing is to improve the image data by suppressing unwanted distortions or enhancing some image features important for further processing.

2.2 Segmentation

Image segmentation is the technique of splitting a digital image into several parts in digital image processing. Because it extracts the items of our interest for additional processing such as description or recognition, segmentation is a key stage of the image recognition system. This approach is used to isolate the target object from the image so that the object may be analyzed.

3. MODELING AND ANALYSIS

3.1 Single Pre-processing in Image segmentation



We use single pre-processing method for segmentation. First pre-processing method we use contrast stretching. In this technique to improve the contrast in an image by 'stretching' the range of intensity values. It is also helps to obtain fine details about the image.

In this method of segmenting an image into regions of discontinuity. Edge detection methods transform original images into edge images benefits from the changes of grey tones in the image. Edges typically occur on the boundary between two regions. The main features can be extracted from the edges of an image.

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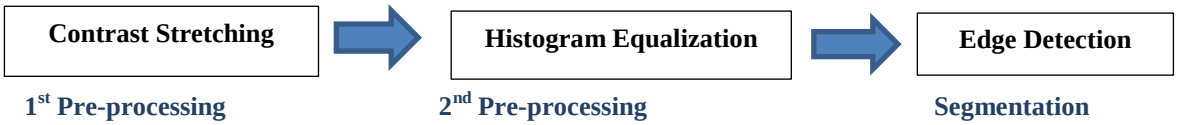
There are various edge detection are there, In this paper we use prewitt edge detection (prewitt mask). This gradient based edge detector is estimated in the 3x3 neighborhood for eight directions. Prewitt detection is slightly simpler to implement computationally than the Sobel detection.

3.2 Double Pre-processing in Image segmentation



We use double pre-processing method for segmentation. First pre-processing method we use contrast stretching. In this technique to improve the contrast in an image by 'stretching' the range of intensity values. It is also helps to obtain fine details about the image.

Second pre-processing method we use histogram equalization processing method to enhance the contrast of the image.It allows the image's areas with lower contrast to gain a higher contrast to obtain fine details of the image.

The segmentation of image processing, partitioning a digital image into multiple regions or sets of pixels. we use edge detection. In this method of segmenting an image into regions of discontinuity. Edge detection methods transform original images into edge images benefits from the changes of grey tones in the image. Edges typically occur on the boundary between two regions. The main features can be extracted from the edges of an image.

There are various edge detection are there, In this paper we use prewitt edge detection (prewitt mask). This gradient based edge detector is estimated in the 3x3 neighborhood for eight directions. Prewitt detection is slightly simpler to implement computationally than the sobel detection.

4. RESULT IMAGES

Single Pre-processing **Vs** **Double Pre-processing**

Figure 1

Figure 2

Figure 3

Figure 4

5. CONCLUSION

Today, digital image processing is widely used. Pre-processing, Image enhancement, and Segmentation are just a few of the image operations it may perform. We use a double pre-processing strategy for segmentation in this paper. We lose several image traits or attributes when we use the direct segmentation method. However, by using a two-step pre-processing procedure and subsequently a segmentation process, we can extract fine details from a digital image. In general, this method outperforms direct segmentation.

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