ISSN 2250-3153

Strength Based Ranking of Edges in Segment Blurred Digital Images

Rekha Dua, Deepika Garg, Girish Garg

Department of Computer Science and Engineering, AITM College, Haryana, India

Abstract- Edge Detection is a part of various image processing operations. Usually image is smoothen, sharpen even deblurred before performing edge detection so as to generate finer edges. This approach does works well in various cases, but there are cases where such things can damage the actual data present in image, which can be due to improper smoothening or de-blurring or excessive of both. In such cases edge detection might miss some inferior and less prominent edges which can be important part of image structure. Thus an approach which keeps inferior edges but still distinguishes them from the other prominent edges is needed. Our approach involves a color scheme for visual ranking of edges, a marking procedure for edge probability checking, comparison threshold system and benchmarking for ranking. The approach used is influenced by behavior of ants in real world, thus will involve different ant-bots in different steps for marking of pixels and later on benchmarking them. A static benchmarking table having values ranging from 20-240 is used to allot ranks to edges as per their matching strength, thus relative color from defined color scheme. Color Scheme plays an important role in prioritization as the order and the gap in visual band of color scheme leads to clear distinction of prominent and inferior edges.

Index Terms- color scheme, matrix, neighbor, and pixel.

I. INTRODUCTION

Image Processing

Analyzing, enhancing, compressing, and reconstructing images by the use of Set of computational techniques is known as image processing. Image processing has wide applications in many areas, such as astronomy, medicine, industrial robotics, and remote sensing by satellite. For image processing, image act as an input as well as output with some different parameters.

Image Resizing and scaling

Image scaling is the process of changing size of a digital image, either increasing or decreasing it, but keeping the aspect ratio intact. Size of Original and processed image are always in ratio, e.g. 1:1.3 or 1:0.6. Image Resizing is a broader term in which size of image changes but aspect ratio might not remain same .i.e amount of change in width is not equal to amount of change in height of image. Scaling/Resizing algorithms vary in terms of efficiency, smoothness and sharpness. As a result of scaling/resizing there may be loss of sharpness, clarity or even introduction of jaggedness.

Edge Ranking

Each strong edge have many neighbouring edges related to them. Each explored edge is distinguished by two parameters:

i) Average gradient magnitude by the edge.
ii) Number of other edges connected or coupled into the edge.

The following two –key schemes can be used for ordering the selected curves:

i) Order by number of linked edge.
ii) If several edges got the same rate, order them by the gradient magnitude along the edge.

The first specification rank detected edges by their "strength". The second specification promotes the strong edge having many neighbouring edges related to them. The above factors allows us to select and rank "the most non-trivial" image edges and to use them for further processing.

II. RESEARCH ELABORATIONS

The ACO technique in image processing and graphical applications has more consideration over past few years. As defined before, ACO techniques present as a natural tool for image processing because of their confined nature and simple parallel computing implementation. Usually image is smoothen, sharpen even de-blurred before generating fine edges by using edge detection techniques. This approach carry out well in various cases, but there are cases where specific things can damage the actual data appear in image, which can be due to incorrect smoothening or de-blurring or overdone of each one. In such cases edge detection might miss some minor and less defined edges which can be important part of image form .Thus an approach which holds inferior edges but still remarked them from the other prominent edges is needed.

We are proposing a new approach towards edge detection and prioritization in blurred images. Our algorithm does not recognize image de-blurring thus eliminating any chances of data loss. We know that a blur image will give multiple edges in an area of concern, few among these edges will be non-mark-able and less useful, and few others will be much noticeable, strong and useful. We simply do not remove these non-prominent edges, we detect each and every possible edge in our area of concern, calculate its strength, importance and give different strength values of edge pixels.

We use this generalized formula for converting input images to grayscale images:-

Grayscale Value= .299 * red + .587 * green + .114 * blue

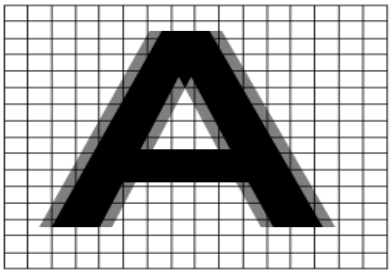


Figure1: Original Image

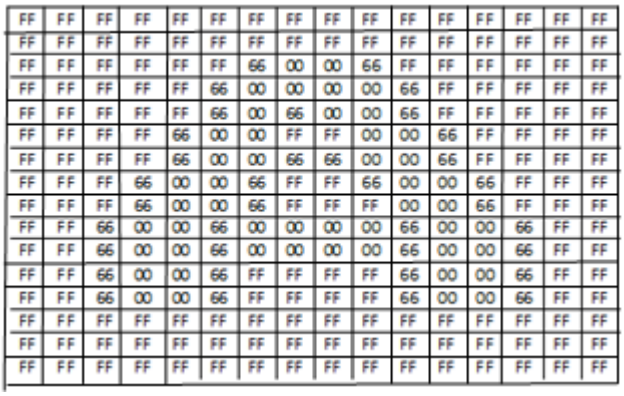


Figure 2: Hex Memory Matrixes for Grayscale Image

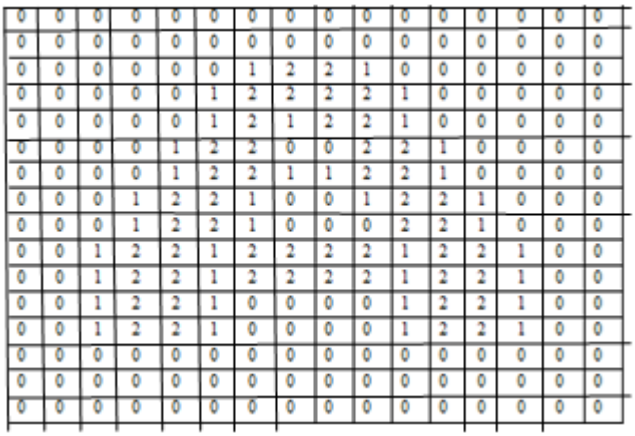
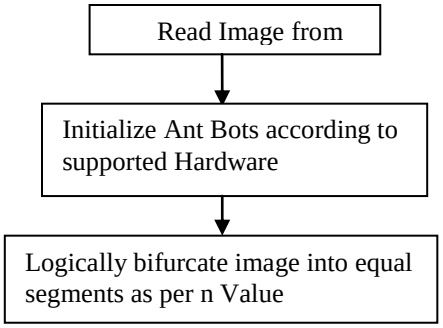
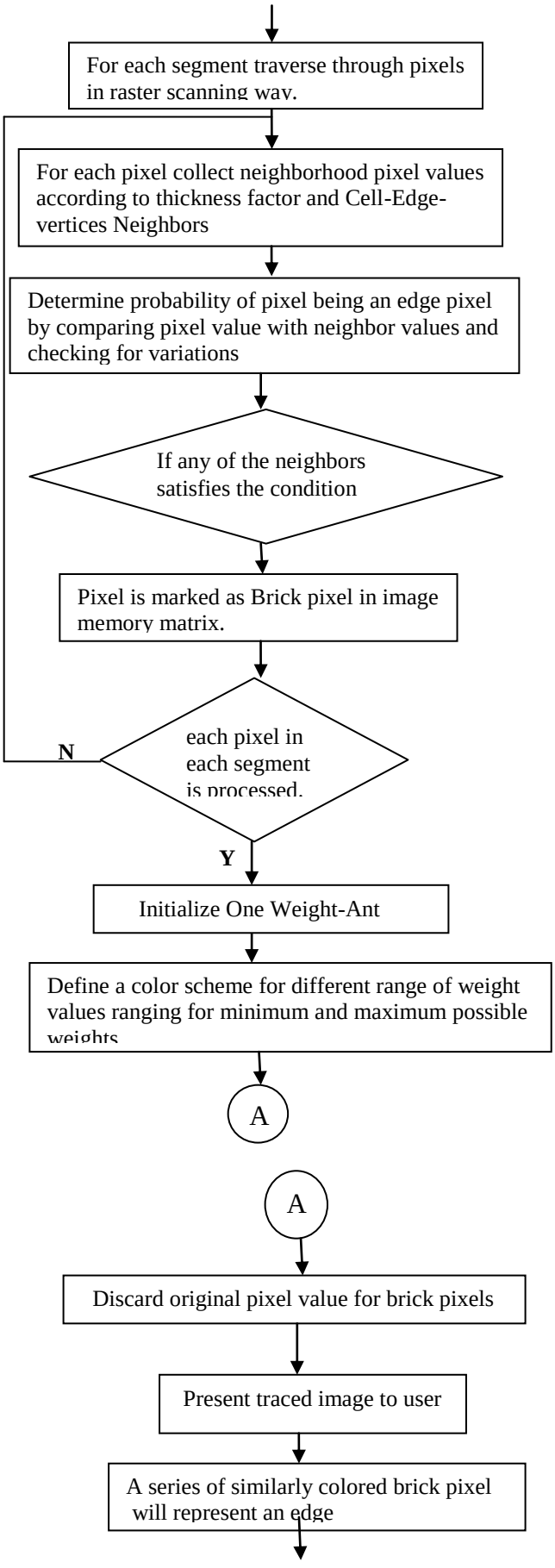


Figure 3: Memory Matrix for Brick Cells

Flowchart of Proposed Technique





Differentiate itself from other differently Colored edges.

Figure 4: Flowchart of proposed technique

III. RESULTS AND FINDINGS

Proposed approach is developed in .net C# technology. Tests were performed over various 256×256 sizes of standard test images.

In test image, red color is assigned to the most prominent edge and blue color to the less prominent edge. Our approach mark edges with different color according to their strength. Each test image has different structure of edges from which some are clearly visible or some aren't. The difference is calculated by method defined in our approach. Some test image containing curved lines which is prioritized according to their edge strength by this proposed technique. So we can say that ACO gives clean and continuous edges and marks edges by strength with different colors.

Figure 5: Input Test Image 1

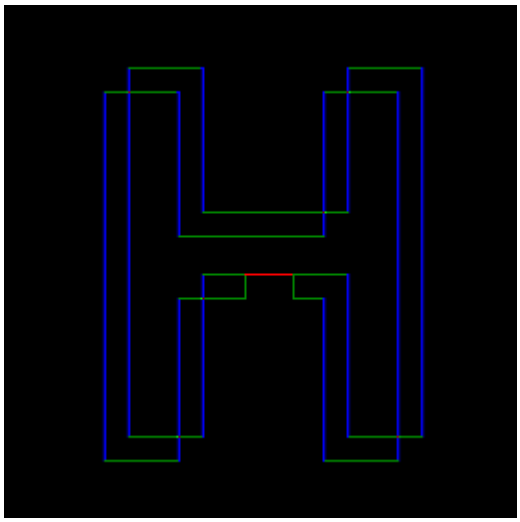


Figure 6: Output Test Image 1

In this Image, separation and continuity exists between edges in regions. Still algorithm easily shows this distinction of edges with the help of different colors and prioritizes the edges by ranking them according to strength. After viewing the results it can be said that new proposed technique has provided expected results.

V. CONCLUSIONS

With the proof of shown images and results, we can state that we have succesfully detected edges in normal as well as blurred digital images and ranked them using different color values, and this ranking can be visually connected by differently color marked edges according to their strength and importance.

We have chosen to work with basic shapes having fragment blurs, so that input and results can be visually confirmed by humans. More complex images have also been included in our set of test inputs.

Results appear to be above satisfactory for different sets of inputs, some of them can be visually corelated and some can't. Thus we can say that we have been successful in presenting and implementing a new approach for detecting and prioritizing edges in blurred digital images, without using any deblurring and loss of data.

ACKNOWLEDGMENT

We would like to acknowledge and extend our heartfelt gratitude to Mentor, Institute, Parents and fellow well-wishers who have provided their support in completing this work.

REFERENCES

[1] Yanfang Che "Ant Colony Search for Edge Detection" IEEE 4th International Congress on Image and Signal Processing 2011

[2] M. Dorigo and S. Thomas, *Ant Colony Optimization*.Cambridge: MIT Press, 2004.

[3] *https://en.wikipedia.org/wiki/Image_scaling*

[4] Jing Tian, Weiyu Yu, and Shengli Xie, "An Ant Colony Optimization Algorithm For Image Edge Detection", i.e. Proc. of the IEEE International, 2008.

[5] Anna Veronica Baterina," Image Edge Detection Using Ant Colony Optimization" Wseas Transactions on Signal Processing,2010

AUTHORS

First Author – Rekha Dua, M.tech (CSE), AITM College,Haryana,India. Email:rekhaletusc@gmail.com
Second Author – Deepika Garg, Assistant Professor, M.tech (CSE), AITM College,Haryana,India, Email: vipu1987@gmail.com
Third Author –Girish Garg, B.E(CSE),AITM College, Haryana, India., Email:girish020986@gmail.com