A Review: Image Edge Unmasking by Applying Renovated and Colony Optimization Technique

Nitin Tarar[1], Vikas Kamra[2]

M.Tech, CSE,JCDV, Sirsa, India [1]

Assistant Professor (CSE), JCDM College of Engineering, Sirsa, India [2]

Abstract: Edge detection is a cardinal mechanism to be implemented in the image processing. Edge detection recognises the points in the digital image where the disruptions occur in the digital image. Ant colony optimization is an inhabitant based expedient for the illumination of the optimization based complication. ACO is galvanized by masticating behaviour of ants. This ransack behaviour of ants is used for unfold the problem of unmasking of edges.In this paper we proposed a renovated ACO algorithm for digital images edge tracking down. We have proposed a new modified ACO algorithm for better perception in the images, also which gives very good performance of the enhanced algorithm and it correlate the experimental results with antecedent standard one. The crucial thing need to be considered in the ACO algorithms is the acquaintance of framework of disclosure with post erudition about the framework of previous outcomes.

Keywords: Acquaintance, Edges, ACO, Shortest path

I. INTRODUCTION

Digital image processing is a process which processes the digital image by makes use of the different algorithms which are computer based.Edge unmasking is an elementary scheme for perusing the digital image proceedings. Edges in the digital images contain vital knowledge and edges must have to be detected and masked. In lots of techniques developed over the decades ACO is a suitable and satisfactory method for the optimization problems. The basic image processing technique follows some of the steps from top to bottom which includes: Repetition, transmission, compression, Image enhancement, edge detection techniques on image and also the proper and complete understanding about the image.
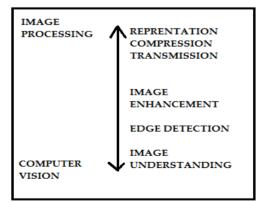
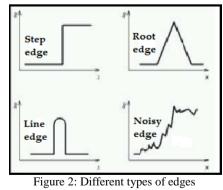

Figure 1: Basic processes in image processing

In this paper we are going to discuss the methods of edge unmasking, ANT colony optimization, different types of edges.

Edges in Digital Image
An edge may be illustrated as a arranged set of cogonated pixels that forms a boundary between two dislocated regions.
 An edge isthe substantial or spiritual line that fixes up the limit and this edge disunite the plane or some
objects. Edges are the sudden jumps having high frequency. If we are able to discover or unmask edges in a correct and accurate way we become able to find and locate the basic properties about the images. So, by identifying the edges in the image the different features can be measured accurately.According to variation of intensity.Different types of edges are shown in fig
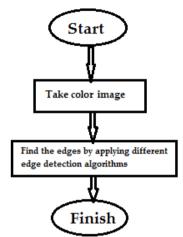

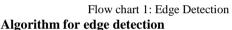Figure 2: Different types of edges

Edge detection
Edge detection is a well developed area within image processing. Edges are the pixels where the brightness changes in very frequent manner. Edge detection is a vital part in the image processing. We must have good understanding of the edge unmasking techniques. For having the good knowledge of the properties and features,

like extraction of features and detection of features point disclosure is an important process. The features can be extracted by finding the pixels in the digital image having the high intensity. The extraction of the image identifies points in an image where discontinuities or abrupt changes occur in the magnitude of intensity.

Flow chart 1: Edge Detection

Algorithm for edge detection
1. Takecolor image
2. Smooth the image which have bi noise in images .the smoothing process is done without disturbing the edges.
3. Perform the differentiation on the images, which will manifold the quality of edges.
4. Apply the thresholding to find edge pixels
5. Localize the edges
6. Assessment with the algorithms.
7. Get the image after edge unmasking

Ant colony optimization (ACO)
Ant colony optimization (ACO) is a standard used for the optimizing problems. This ACO works on the principal that real ants get deposited on the ground to find some promising and appropriate paths. The inspecting and scrounge behaviour of ants is significant. This ACO works as these ants lives in the colonies and these have the hunting nature. To get the food the ants try to find the shortest distance between food sources and nest. When ants try to find the food they sepulchre something on the way i.e. on the ground which is called as pheromone. These pheromone trials make ants able to reach to their previous destination as they make ants able to recognise their previous paths. ACO works by making a graph for the whole procedure. When there are different paths in the graph then ant choose that path which has more pheromone deposited. Profanity of choosing path increases as the quantity of pheromone increases

Jing Tina's Approach
Ant colony optimization (ACO) is an optimization algorithm inspired by the natural behaviour of ant species that ants deposit pheromone on the ground for foraging. In this paper, ACO is introduced to tackle the image edge detection problem.The proposed ACO-based edge detection approach is able to establish a pheromone matrix

that represents the edge information presented at each pixel position of the image, according to the movements of a number of ants which are dispatched to move on the image. Furthermore, the movements of these ants ardriven by the local variation of the imagepsilas intensity values.
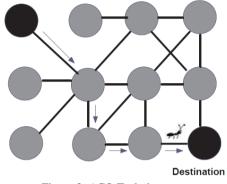

Figure 3: ACO Technique

II. LITERATURE REVIEW
Jeetu Singh, AnkitVidyarthi proposed an improved ACO algorithm for digital images edge classification. The classification is basically done as per the natural phenomenon of the movement of ants for searching paths. They have proposed a new modified ACO algorithm for better visual effects and compared the experimental results with previous standard one. [1]
SivaramakrishnanRajaramanandArunChokkalingampropo ses a modified bacterial foraging algorithm with a probabilistic derivative approach to detect edges in chromosome images. Chromosomal Edge Detection is fundamental for automatic karyotyping for noise reduction and getting useful messages from the edges. Subjected to staining and other imaging constraints, chromosomal banding patterns lack in resolution, contrast and suffer from noise. For this reason, chromosomal edge detection is highly preferred prior to the segmentation and classification of chromosomes. When the chromosomes occlude or overlap, edge detection becomes extremely difficult.Edge detection is highly challenging and this paper presents a Modified Bacterial Foraging Algorithm (MBFA) based on a probabilistic derivative methodology based on Ant Colony Optimization (ACO) for the detection of edges in chromosomes.
Bacterium searches for the nutrients in the direction decided by a probabilistic derivative approach derived from ACO and the edge pixels are identified and traversed. The study reveals that MBFA gives the most promising results in detecting chromosomal edges, greatly reducing the computation time and memory requirements. Acceptable values of parameters for performance evaluation like Kappa (K) and Entropy (E) are achieved with the proposed algorithm in comparison to the other conventional methods of edge detection. [2]
Zhengmao Ye, HabibMohamadian, and Yongmao *Y proposed Feature* detection is a fundamental technique in broad fields of image processing, pattern recognition and computer vision. A digital image in general contains

objects, edges, noises and background. Critical changes in properties of objects can be captured via detecting sharp variations in image brightness. The edges can be detected via numerous approaches on a basis of image intensity changes. Edge broken and false detection are typical problems using classical methods, which will result in information loss and feature deformity. The notion of optimization is thus introduced into edge detection. [5]

The Canny edge detector and Ant Colony Optimization (ACO) detector are among the most successful and effective approaches for edge detection. The Canny edge detector is designed to capture edges by searching local optima of the gradient of the intensity. It is susceptible to noises presenting on the raw images, so details of images could be slightly changed when Gaussian smoothing is applied. To\ improve accuracy, the adaptive edge tracing scheme is proposed.

On the other hand, artificial intelligence has also been introduced. Being one of metaheuristic optimization approaches, the evolutionary computing oriented ACO becomes a promising approach for feature capturing without necessity of smoothing filters. Selection of maximum intensity difference as the path visibility function for ACO will contribute better to generate true edges and avoid false edges. Both the adaptive Canny edge detection and enhanced ACO are proposed in this article. Comparative studies are also conducted to evaluate the edge detection qualities. The outcomes are analyzed and evaluated from both qualitative and quantitative points of view, where merits and drawbacks of the two schemes have been indicated.P.Thukaram, S.J.SarithaImage processing is a method to convert an image into digital form and perform some operations on it, in order to get an enhanced image or to extract some useful information from it. Image edge detection is the one of the method in the image processing. Edges are significant local changes of intensity in an image.Edges typically occur on the boundary between two different regions in an image. The aim of the edge detection is to extract the important features from edges of images. In this paper, Ant Colony Optimization Algorithm is introduced to tackle the Image edge detection problem. The proposed ACO-based edge detection approach is able to establish a pheromone matrix that represents the edge information presented at each pixel of the image, according to the movements of a number of ants which are dispatched to move on the image. [8]

Lixiong Gong, Xiangsheng Kong, Yong Liu, Min Huang Put forward a method combined improved ant colony and Zernike moment to detect image subpixel edge aiming at traditional ant colony algorithm's drawback of long time consumption and easily to be affected by noise. The methods improved parameters from clustering centre setting, clustering operator selecting and pheromone updating, then extracted subpixelimage edge based on Zerinke moments. Therefore, the result of image edge extraction is good and effective. Lastly, least square fitting is used to locate coordination of image edge and bearing of SKF 32308 J2/Q dimensions such as inner and outer diameters were measured. The result shows that the algorithm proposed can well to measure circular parts dimensions and has high precision. [10]

GurpreetKaur Gill and Parminder Singh Saini stated the need to detect edges more efficiently leads to develop newer techniques and newer algorithms. The edges get more corrupt in noisy environment. So it becomes difficult to detect edges in such cases. So an approach that could develop edges with dense edge intensity needs to be developed. A review study is conducted where many techniques have been developed for the same purpose. In my proposed work, wavelets with higher order will be given as input to ACO. Then optimization algorithm ACO will be applied. Hence the smoothness of intensity of images and the density of edges will define the effectiveness of the proposed method. [16]

III.OBJECTIVES

There are many goals of the of the edge detection technique. In this paper we are going to apply the remodified ACO on the images for the edge detection whose main objectives are as follows:

- Assemble the colored images
- Identification of the edges in the images
- Recognise the edges by the proper adjustments in the abrupt intensity changes
- Implement the technique of edge detection in a suitable way so that the properties and features of the image can be unfolded in a convenient way
- Renovated ACO algorithm is proposed for the proper take care of the problem of edge detection in the digital images.
- Enhanced ACO Algorithm is made in such a way that it manifolds the performance as compared to previous algorithms for the edge detection
- Renovated ACO's implementation to achieve best perception in images.

Problem Statement

Identifying the edges in the images is a challenging process. To mark-up the proper changes occur in intensity is also very difficult to look after. But for the recognition of the content of the images edge detection is considerable phenomenon. For this edge detection purpose the algorithm must be selected in such a way that it will produce the desired output. Which include the clear and sharp edges for better performance and also the algorithm which we apply for the edge detection filter the relevant information from the images and sustaining the essential attributes of the images. The proposed work will give a renewed algorithm for the ACO which give its best results when applied for edge detection.
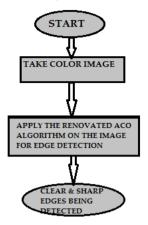
IV.PROPOSED METHODOLOGY

The proposed approach used is basically the alteration and conversion of the previously used ACO algorithm into a new refined and enlightened algorithm for the edge detection. New modified algorithm for ACO is

introducedor accounterment the complications of tracking down the edges in the images.

Flow Chart 2:Proposed Work

The process of grasping the observation and knowledge of the images is very crucial concept. The renewed algorithm formed is to be applied on the images to get the best results for the detection of edges. As edge detection is a fundamental and keyproblem in the image diagnosis.

V. CONCLUSION AND FUTURE WORK

In this paper a modified ACO based image edge detection has been auspiciously cultivated. The proposed approach turnout to produce a remarkable performance as compared to the previously used algorithms for the disclosing of edges.By the use of modified ACO the perception of the images has also increased to a great extend. In future we would try to increase the more accuracy of the edges and try to fetch the best performance. The ACO is applied in such a way that it will extract the attributes of images in a convenient way.

REFERNCES

[1]Jeetu Singh, AnkitVidyarthi "Digital Image Edge Detection using Enhanced Ant Colony Optimization Technique", International Journal of Computer Applications, 2013

[2] SivaramakrishnanRajaramanandArunChokkalingam "Chromosomal Edge Detection using Modified Bacterial Foraging Algorithm", International Journal of Bio-Science and Bio-Technology, 2014

[3] S.Venkatesan and Dr.S.SrinivasaRaoMadane" Experimental Research on Identification of Face in a Multifaceted Condition with Enhanced Genetic and ANT Colony Optimization Algorithm", International Journal of Innovation, Management and Technology, 2010

[4] ANNA VERONICA BATERINA, CARLOS OPPUS" Image Edge Detection Using Ant Colony Optimization", 2010

[5] Zhengmao Ye, HabibMohamadian, and Yongmao Y" Quantitative Analysis of Feature Detection Using Adaptive Canny Edge Detector and Enhanced Ant Colony Optimization", International Journal of Modelling and Optimization, 2012

[6] Prashant Kumar Mohanty" On Edge Detection of Images Using Ant Colony Optimization and Fisher Ratio", 2012

[7] ShwetaAgarwal" A REVIEW PAPER OF EDGE DETECTION USING ANT COLONY OPTIMIZATION TECHNIQUES", International Journal of Latest Research in Science and Technology, 2012

[8] P.Thukaram, S.J.Saritha" Image Edge Detection Using Improved Ant Colony Optimization Algorithm" International Journal of Research in Computer andCommunication Technology, 2013

[9] Yu Xiong "Research on an Edge Detection Algorithm of Remote Sensing Image Based on Wavelet Enhancement and Morphology", JOURNAL OF COMPUTERS, 2014

[10] Lixiong Gong, Xiangsheng Kong, Yong Liu, Min Huang4 "Subpixel edge extraction of part ant colony optimization-based and dimensional measurement ", 2014

[11] Sunanda Gupta, Charu Gupta, S.K. Chakarvarti" Image Edge Detection: A Review "International Journal of Advanced Research in Computer Engineering & Technology (IJARCET), 2013

[12] RebikaRai, RatikaPradhan, M.K.Ghose "Ant based Swarm Computing Techniques for Edge Detection of Images- A Brief Survey", International Journal of Emerging Technology and Advanced Engineering Website, 2013

[13] Charu Gupta, Sunanda Gupta" Edge Detection of an Image based on Ant Colony Optimization Technique", International Journal of Science and Research (IJSR), 2013

[14]RekhaDua, DeepikaGarg, GirishGarg "Strength Based Ranking of Edges in Segment Blurred Digital Images",International Journal of Scientific and Research Publications, 2013

[15] NavjotKaur, ParminderSingh"An Efficient Edge Detection Approach Based On Pollination BasedOptimization",Int. Journal of Engineering Research and Applications , 2013

[16] GurpreetKaur Gill and Parminder Singh Saini"A SURVEY ON ADAPTIVE EDGE DETECTION TECHNIQUES USING ANT COLONY OPTIMIZATION TECHNIQUES", International Journal of Applied Engineering and Technology, 2014

[17] VarshaPatankar" A Implementation of Ant Colony Optimization Technique for Cancer Diagnosis ", International Journal of Current Engineering and Technology, 2014

[18] Jing Tian, "An ant colony optimization algorithm for image edge detection", IEEE, 2008