AREA OF INTEREST REORGANIZATION FROM MEDICAL IMAGE USING SOFT COMPUTING TECHNIQUES

Dissertation submitted in fulfilment of the requirements for the Degree of

MASTER OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

By

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TOPIC APPROVAL PERFORMA

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PROPOSED TOPIC : Area of interest recognization from medical images using soft computing techniques

Qualitative Assessment of Proposed Topic by PAC		
Sr.No.	**Parameter**	**Rating (out of 10)**
1	Project Novelty: Potential of the project to create new knowledge	6.86
2	Project Feasibility: Project can be timely carried out in-house with low-cost and available resources in the University by the students.	7.14
3	Project Academic Inputs: Project topic is relevant and makes extensive use of academic inputs in UG program and serves as a culminating effort for core study area of the degree program.	7.14
4	Project Supervision: Project supervisor's is technically competent to guide students, resolve any issues, and impart necessary skills.	7.29
5	Social Applicability: Project work intends to solve a practical problem.	6.86
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PAC Member 8 Name: Tejinder Thind	UID: 15312	Recommended (Y/N): Yes
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Final Topic Approved by PAC: **Area of interest recognization from medical images using soft computing techniques**

Overall Remarks: Approved

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DECLARATION BY THE SCHOLAR

I hereby declare that the research work reported in the dissertation/dissertation proposal entitled "**AREA OF INTEREST REORGANIZATION FROM MEDICAL IMAGE USING SOFT COMPUTING TECHNIQUES"** in partial fulfilment of the requirement for the award of Degree for Master of Technology in Computer Science and Engineering at Lovely Professional University, Phagwara, Punjab is an authentic work carried out under supervision of my research supervisor **Mr. Gurbakash Phonsa**. I have not submitted this work elsewhere for any degree or diploma.

I understand that the work presented herewith is in direct compliance with Lovely Professional University's Policy on plagiarism, intellectual property rights, and highest standards of moral and ethical conduct. Therefore, to the best of my knowledge, the content of this dissertation represents authentic and honest research effort conducted, in its entirety, by me. I am fully responsible for the contents of my dissertation work.

Signature of Candidate

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SUPERVISOR'S CERTIFICATE

This is to certify that the work reported in the M.Tech Dissertation/dissertation proposal entitled "**AREA OF INTEREST REORGANIZATION FROM MEDICAL IMAGE USING SOFT COMPUTING TECHNIQUES"**, submitted by **Manu** at **Lovely Professional University, Phagwara, India** is a bonafide record of his / her original work carried out under my supervision. This work has not been submitted elsewhere for any other degree.

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Mr. Gurbakash Phonsa

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2) **Neutral Examiners:**

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   Name: _____

   Affiliation: _____

   Date: _____

   Internal Examiner

   Signature: _____

   Name: _____

   Date: _____

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I take this opportunity to present my votes of thanks to all those guidepost who really acted as lightening pillars to enlighten our way throughout this project that has led to successful and satisfactory completion of this study.

I am grateful to our **Lovely Professional Universit**y for providing me with an opportunity to undertake this project in this university and providing us with all the facilities.

I am really thankful from my heart to **Mr. Gurbakash Phonsa**, who allowed me to do this project under his guidance. I am highly thankful to my family and friends for their active support, valuable time and advice, whole hearted guidance, sincere cooperation and pains-taking involvement during the study.

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ABSTRACT

Image segmentation has a significant role in image processing and it is core step of image processing. Image segmentation is an image processing technique distinct as in which partition the input image into numerous section in forms of pixel or breakdown the image into objects and regions. It's most significant role is to represent an image on noise free form. It is mainly used to detect the objects, relevant data in digital image and their boundaries. Till now there are various image segmentation techniques have been developed and researchers are continuously developing and implementing more techniques and enhancing them in order to make image more smother and noise free. In this report we will go through from different type of image segmentation like: thresholding, Edge base segmentation, region base segmentation and different types of soft computing techniques.

Chapter 1

INTRODUCTION

1.1IMAGE PROCESSING

Image processing is widely applied in several fields and in many crinkles. The most important aim of image processing is to represent digital image into more and more simpler form (Smooth and noise free).Image segmentation used to find the objects , boundaries in image and line in digital image. Practical application of image segmentation range from medical applications (Tumours, pathologies, measurement of tissue volume, computer surgery, treatment, diagnosis and planning), filtering the image noise, face and fingerprint reorganize, locate objects from satellite images etc. Edge detection extensively used approach for segmentation. Obesely the very first step in an image recognition system the edges sensibility plays an important role for digital images. In an image, an edge may be the borderline or disconnectedness between two regions with fairly distinct grey level properties. An edge can be a result of changes in colour, shade, light or texture, all these changes may be required to resolve the depth, magnitude orientation and surface properties of the digital image.

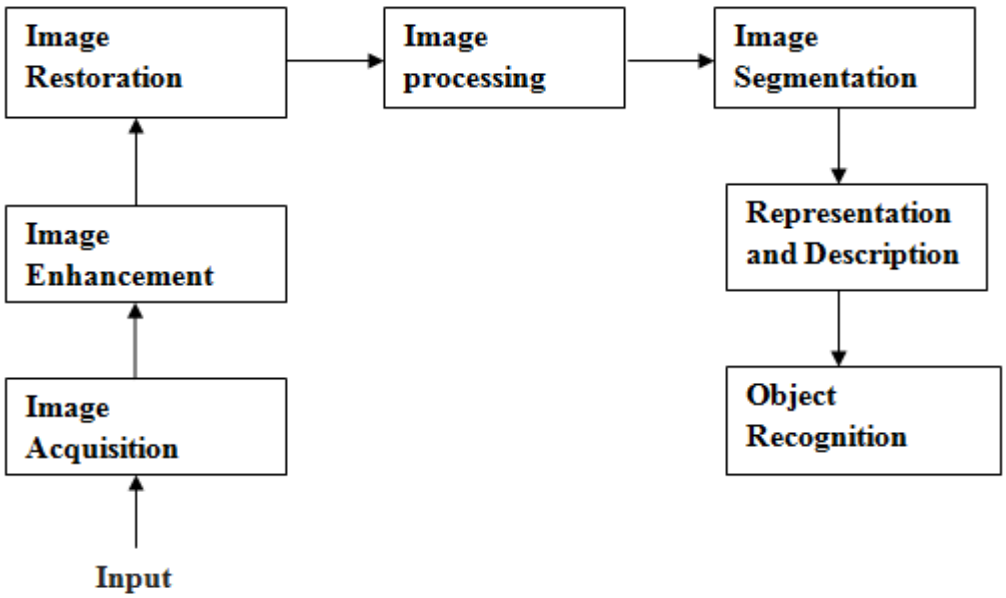

Fig 1.1 Fundamentals steps of digital image processing

These Techniques are:

1. **Image Acquisition :** In image processing image acquisition is first step of fundamental digital image processing it means to obtain a image. It could be as simple and easy as being specified an image that is previously in digital form. Generally this process involves pre-processing for example scaling etc.

2. **Image Enhancement :** Image enhancement is among the simplest and most attractive region of digital image processing. Mainly, the design behind enhancement method is to bring out detail that is obscured, or simply to highlight definite qualities of interest in an image like changing brightness & contrast etc.

3. **Image Restoration :** It is type region that also contract with recovering the appearance of an image. On the other hand, unlike enhancement, which is subjective, image restoration is objective, in the sense that restoration techniques tend to be based on mathematical or probabilistic models of image degradation.

4. **Color Image Processing :** This image processing is an area that has been acquisition its significance because of the major increase in the use of digital images over the Internet. It possibly will contain color modeling and processing in a digital field etc. Image processing get better the images in ways that raise the probability for success of other procedures.

5. **Morphological Processing :** In this processing deal with tools for take out image components that are helpful in the representation and description of shape.

6. **Segmentation :** Segmentation itself is the method of splitting or separating the image into smaller section. In Image Segmentation edges, boundaries, regions are identify for processing. In image segmentation process the output will comes in form of pixels that cover together to form entire image. Segmentation have various techniques and these are used in image processing.

7. **Representation and Description :** This fundamental step for all time track the output of a segmentation stage, which normally is raw pixel data,

constituting moreover the boundary of a region or each and every one the points in the region itself. Selecting a representation is only element of solution for changing raw data into a suitable form. Description deals with extracting characteristic that output in a number of quantitative information of interest or are essential for distinguishing one group of objects from another.

8. **Object recognition :** It is one type procedure that allocates a label, such as, "vehicle" to an object depends on its descriptors or to allocate a label to an entity based on the in order provided by its descriptors.

1.2 IMAGE ENGINEERING

Segmentation itself is the method of splitting or separating the image objects into smaller objects of parts. In image segmentation process the output will comes in form of pixels that cover together to form entire image. Each pixel in segment is compared by the predefined properties (colour and intensity of other pixels). There is no particular level of dividing the image into sub parts this all depends until problem being resolved i.e. only stop the segmentation while object in image or application isolated. There is level is image segmentation in image processing which is known as image Engineering. Image Engineering [1][3] divided further into three level.

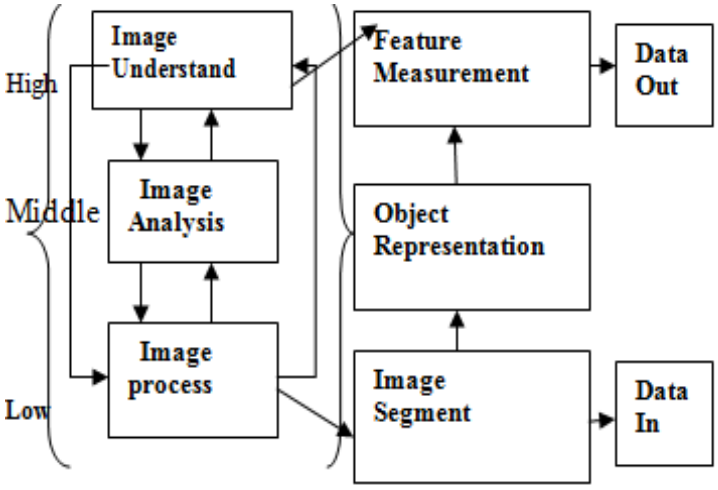

Fig 1.2 Image Engineering process

Image techniques or image engineering can be clubbed together in a general framework called Image Engineering. Image Engineering can be defined as that which contains three layer to process the image:

1. Image understanding
2. Image Analysis
3. Image Processing

1.2.1 Image processing: This is the bottom level operations. These operations are perform on pixel level. This layer take the image and modified that version image into a different form or perform some changes among the images and furthermore enhances the digital image's visual effect.

1.2.2 Image analysis: This is the middle operations of this structure that focus on measuring. The PCA generate a set of images from certain set. It's main function is take out a meaningful information or data from images.

1.2.3 image understanding: In this top stage operations each target is studied more further connecting each other as well explanation of original images. It is actually translating those regions and objects to make sense of what's really occurring in the image.

1.2.4 image segmentation: As we discussed before a segmentation itself is the method of splitting or separating the image into smaller section. In Image Segmentation edges, boundaries, regions are identify for processing. In image segmentation process the output will comes in form of pixels that cover together to form entire image. Segmentation have various techniques and these are used in image engineering.

1.3 IMAGE SEGMENTATION TECHNIQUES

In this report we will go through from different type of image segmentation like: Thresholding, Edge base segmentation, region base segmentation and different types of soft computing techniques.

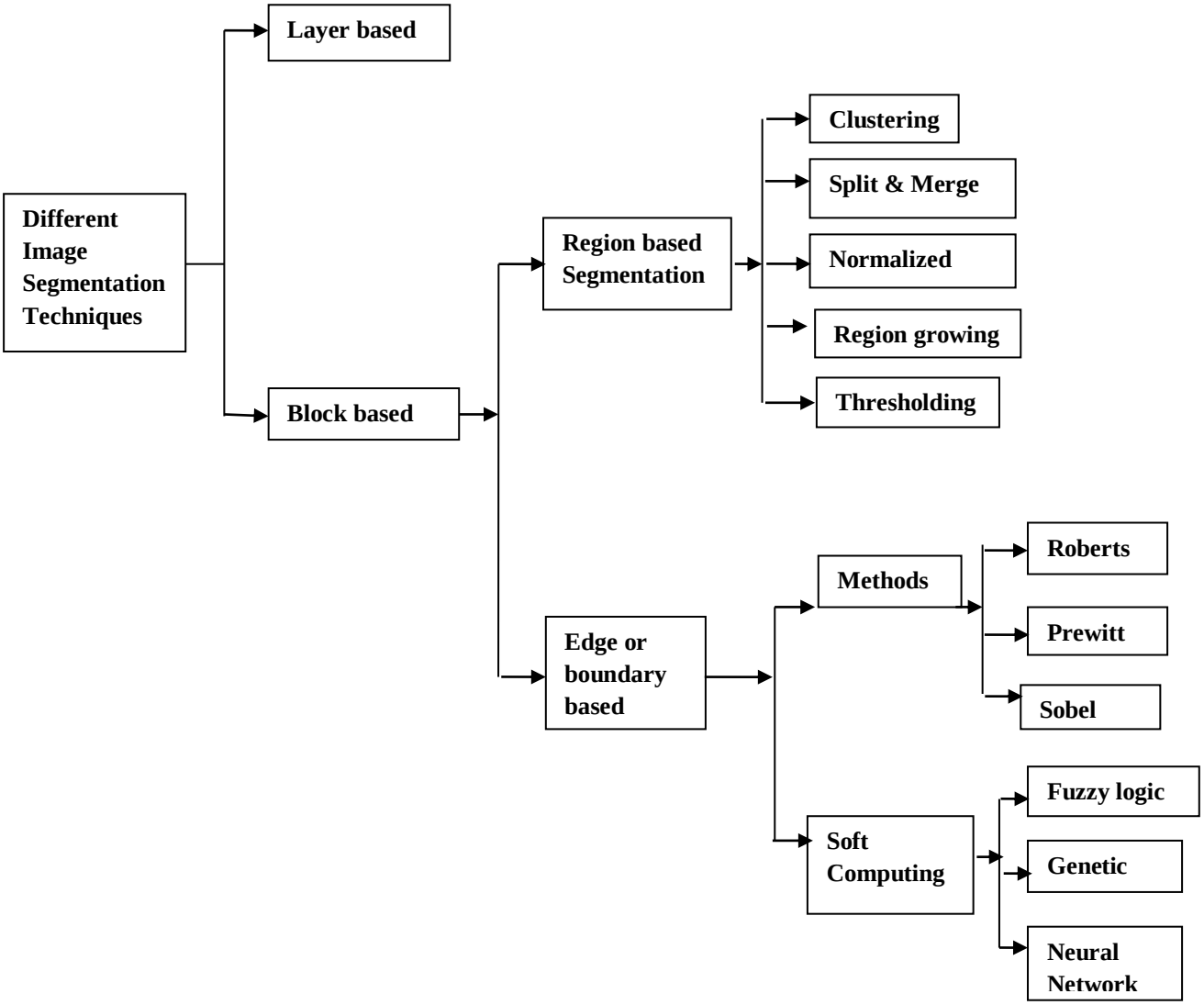

Fig 1.3: Techniques of Image Segmentation

3.1.1 Edge detection:

In this researchers defined the boundaries between two regions. When we applying edge detection method to an image it leads to curves that defined boundaries of object and surface. Edge detection can be defined as that each object is surrounded by a closed border which is visible and can be detected in the intensity value of the image. This segmentation technique plays prominent role in pattern reorganization, image analysis, image processing and computer vision. Figure 1.4 defined that edge detection segmentation technique in steps. Main steps are

Filtering is usually used to recover the performance of an edge detector with respect to noise. **Enhancement** progress the image in ways that raise the chances for achievement of the other processes. In **Detection** we want points with strong edge

elements. On the other hand, numerous points in an image contain a nonzero value for the gradient, and not every of these points are edges for a particular application. As a result, several methods must be used to resolve which points are edge points.

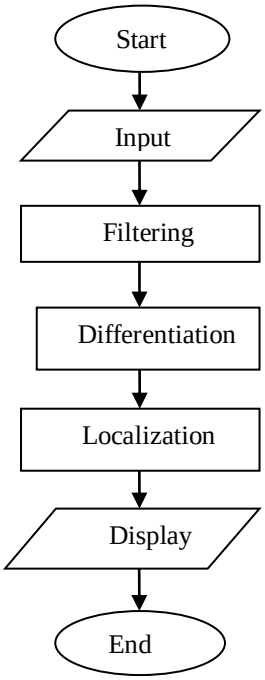

Fig 1.4 : Edge detection process

Edge detection methods:

1. **Robert Detection**: This method is used as a operator for edge detection. It present quick, easy to calculate , measurement of 2-Dimension spatial gradient on an image. So that means spatial gradient of highlights regions repeatedly corresponds to its image edges and grey scale image used as an input to the operator. In this method the output signify estimated absolute magnitude of spatial gradient. Input image at the points by given following [3].

-1	0
0	+1

Gx

0	-1
+1	0

Gy

Fig 1.5: Robert Detection mask

2. **Edge Detection:** In this edge detector operator we calculate approximately the magnitude with orientation and edge detection needs different types of gradient edge detection instead of time consuming calculations.. Gradient edge

detection estimate the orientation as of magnitude in x and y directions. This prewitt operator has minimum eight possible orientations and estimated 3x3 neighbourhoods for eight directions. The calculated convolution masks are given below[3]

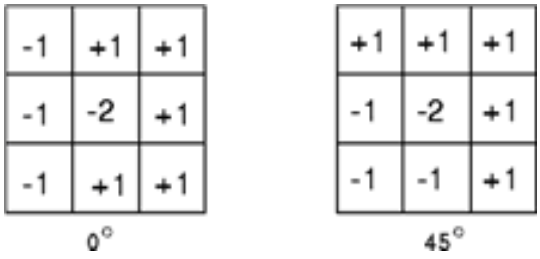

Fig 1.6 Prewitt mask for edge detection

3. **Sobel Edge Detection**: It is also edge detection operator usually this technique used to approximate absolute gradient magnitude at evey point in grey image it present image with 2-D spatial gradient measurement so highlight regions of high spatial rate of recurrence(frequency) correspnd to its edges in image. The sobel operator consist of convolution mask of 3x3 pair shown in figure below.

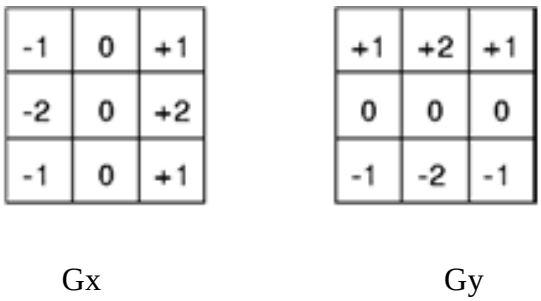

Fig 1.7: Edge Detection Sobel mask[3]

1.3.2 Thresholding Methods

Thresholding method is most important segmentation technique and mostly used technique in image segmentation. In this segmentation method we convert the gray scale image into binary form. For segmentation binary image include required data regarding shape and location of object in image. A conversion from grey image to binary form is valuable for the reason that it reduce the difficulty of data. Threshold methods are:

1. **A Global Thresholding:** Global thresholding one of mostly used method in image processing . It is define intensity value in which input image must have

two peak values and these values are keep up a correspondence to signals from background and image objects.

2. **A Variable Thresholding:** In this thresholding method we separate out image foreground objects from background and its depend on dissimilar pixel intensities of each region in image. Adaptive thresholding define T function (x,y). A regional and local Thresholding based upon neighbourhoods pixels in (x,y) form.

3. **A Multiple Thresholding:** In this method we segments grey image into the from various separate regions. A multiple thresholding is different than local and variable thresholding. It is also defines one to many threshold for specified input image and partitioning image into definite intensity(brightness) regions in image and compare to background and various objects.

1.3.3 Region Segmentation

In this region based segmentation we segment the similar image into various regions. It is also used to determine the region directly. Portioning is done by using grey values of the image pixels. Two basic type techniques of region based segmentation are following:

1. **A Region Growing method:** It is region based segmentation scheme in which pixels group or sub regions are change into large size regions predefined criteria. In region growing pixels begin with set of seed points in this approach the corresponding regions grow via append every seed points those neighbouring pixels have related similar properties like grey scale, colour, texture, shape etc.

2. **A Splitting and Merging:** In this method image takes as a one single region then continually breakdown the image until no extra further breakdown is possible. After the splitting process, merging process take place. In merging technique region is merged with the adjacent regions. The method starts with small regions and then merges the regions which have similar characteristics like greyscale and variable. Quad tree (Splitting data structure) is used here for merging regions if they are similar and adjacent the merging technique is repeatedly until max possible merge.

1.3.4 Clustering Method

Clustering is most popular algorithm in image segmentation. It classifies data and patterns in categories. Two popular examples of clustering methods are K-means and Fuzzy c-means. Both methods capable to produce a divides of images under conditions including cluster number and for recovering cluster algorithm we find out cluster number and centres depend on decision graphs.

1.4SOFT COMPUTING TECHNIQUES:

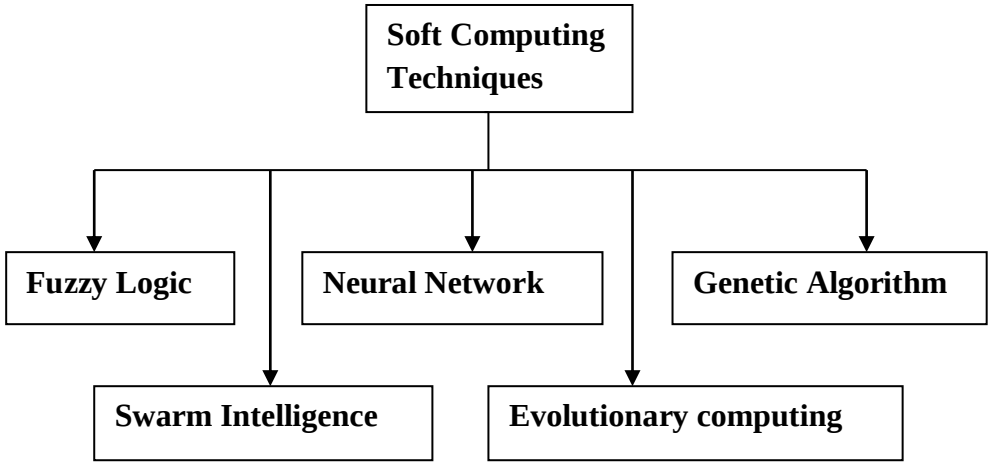

Fig 1.8 Soft computing techniques

1.4.1Fuzzy based Approach: Fuzzy approach is soft computing technique. For edge detection fuzzy logic defines different possibilities. In fuzzy logic one technique is describe a membership function representing the scale of every neighbourhood. Fuzzy set can just performs true fuzzy logic if it is furthermore used to change membership values. This soft computing technique is fast but the performance is inadequate. For this method we use if-then rules. Fuzzy rule IF THEN shows edge recognition plus neighbourhood of centre pixel of input image and Pixels are separated into fuzzy set. In this method homogeneity is evaluated to experiment the similarity of two regions through the segmentation process.

1.4.2Genetic Algorithm Approach: It is soft computing algorithm and play very significant role in image segmentation. Genetic algorithms work in steps:

Selection operator is the first phase in this process it evaluates every individual from the entire population and kept only the fittest ones . It also kept the less fit ones apart from fittest one, the less fit are selected as according to small probability and discard

the other from the population. After the selection operator **crossover** process takes place in this picture, it combines the two individual to have one individual which might better from previous one. The **mutation** operator's main reason is to keep the population differentiated enough throughout the optimization procedure by bringing change in small integer of chromosomes element.

1.4.3Neural Network Approach

This neural network technique is different from artificial intelligence techniques in term of their ability of generalize and learning. This approach is made from a number of elements that are joined with variable weight. It is generally used for pattern recognition. The Neural network is soft computing technique work in layers: In input layer, input provided to neuron is normalize in [0-1] form. And also neuron's output values in [0-1] form. These three layers are fixed numbers of neurons, number of neuron depends on the size of image i.e. equal to image's size (I * J). All neurons have one primary connection with weight equal to 1. All the neurons in all layers are interconnected with previous layer or neuron of one layer is linked with particular neuron of before layer with its command neighbour. Following diagram[3]

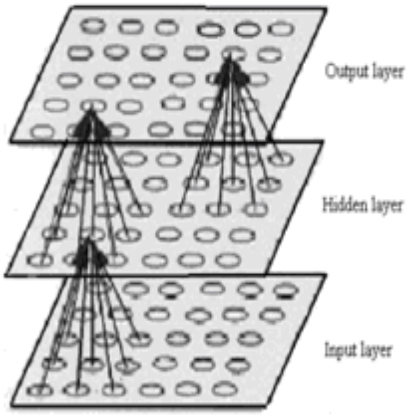

Fig 1.9 ANN(neural network)

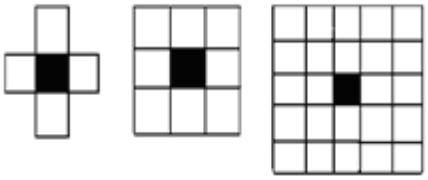

Fig 1.10 First, Second, Third order neighbourhood.

1.4.4Swarm Intelligence and Evolutionary computation: The two algorithms that mainly comprise this field today are the evolutionary computing and swarm intelligence. Although simultaneously both families of algorithms are usually dedicated to solving optimization problems, they are positively not equal, and both has its own individual characteristics. Existing dynamic optimisation mainly focuses completely on evolutionary algorithms and swarm intelligence techniques. Both provide a comprehensive review devoted to swarm intelligence algorithms to fill in the space in the dynamic optimisation domain. In adding up to the major stream ant colony optimisation, Artificial bee colony and particle swarm optimisation algorithms; recent swarm intelligence applications to dynamic optimisation problems (DOPs) are included.

1.5 AREA OF INTEREST REORGANIZATION FROM MEDICAL IMAGE USING SOFT COMPUTING TECHNIQUES:

Image processing is widely applied in several fields and in many crinkles. Image segmentation is one of the most challenging tasks in image analysis & computer vision, as like medical image discovery is a significant work for object recognition of the social organs & they are scope of fields. Edge detection extensively used approach for segmentation. Practical application of image segmentation range from medical applications (Tumours, pathologies, measurement of tissue volume, computer surgery, treatment, diagnosis and planning), filtering the image noise, face and fingerprint reorganize , locate objects from satellite images etc. Obesely the very first step in an image recognition system the edges sensibility plays an important role for digital images. In an image, an edge may be the borderline or disconnectedness between two regions with fairly distinct grey level properties. An edge can be a result of changes in color, shade, light or texture, all these changes may be required to resolve the depth, magnitude orientation and surface properties of the digital image. As there are extensive properties which may problematical false edge recognition, image noise problems, missing of low contrast boundaries etc. The automatic processing of images is needed to suit the real-world scenario.

1.5.1 Edge detection using soft computing

Image processing is widely applied in several fields and in many crinkles. Edge detection extensively used approach for segmentation. Obesely the very first step in

an image recognition system the edges sensibility plays an important role for digital images. In an image, an edge may be the borderline or disconnectedness between two regions with fairly distinct grey level properties. An edge can be a result of changes in colour, shade, light or texture, all these changes may be required to resolve the depth, magnitude orientation and surface properties of the digital image. As there are extensive properties which may problematic as false edge recognition, image noise problems, missing of low contrast boundaries etc. The automatic processing of images is needed to suit the real-world scenario.

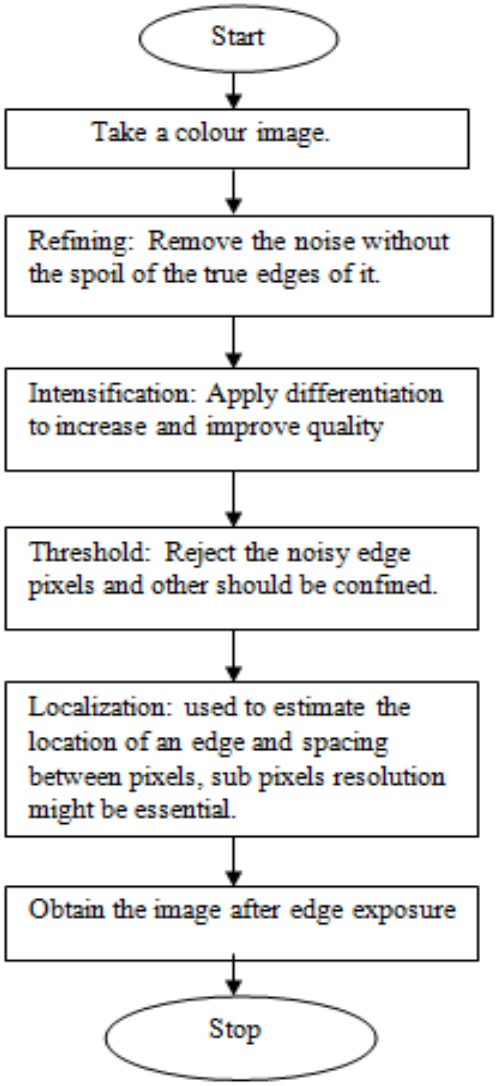

Fig 1.11 Edge detection flowchart representation

Chapter 2

REVIEW OF LITERATURE

1. Li, Bing Nan. 2016,[7] The main objective of this paper is proposed new level set formulation through region competition mainly it tract and detects the arbitrary combination of particular image or objects of image components. Study was recognized based on fuzzy region competition. A novel formulation is well-suited to Gaussian combination modelling. Different type of probability or Bayesian clustering approximation function for selective level segmentation set. Fuzzy logic approach defined selective level set using region competition. But we find that it generally does not hold in most selective segmentation.

2. Alshennawy, Abdallah2009, [20] A fuzzy logic reasoning make approach is planned for edge finding in the form of digital image without find out the value of threshold. The fuzzy is powerful tool for knowledge based expert system. In this paper set of fuzzy rules are enhanced solutions to develop quality of edges. In this paper fuzzy logic enhanced the quality of edges. In this paper fuzzy logic enhanced the quality of edges. But we still find some problems to detect the noise from the original image.

3. Du, Chaoben, and Shesheng Gao, 2017, [2] By using multi-focus image fusion algorithm image segmentation is applied to identify decision map(image) among focused and defocused regions. MSCNN soft computing method could correctly and multi-focus edge boundary between focused and defocused part and after that gets a more correct decision map from the source images. This latest paper on multi scale convolutional neural network. But there still exist some defects related to binary segmented map and images are from time to time misclassify and it leads to the holes and small regions in segmentation map.

4. *K.-S. Low.-Y. Yau* , H.Zhuang2012,[5] Main principle of this paper to apply segmentation on color image by using pulse couple neural network with multichannel connecting furthermore feeding fields to the image. Result shows performance of MPCNN for image segmentation of noisy image when neural circuits recover

processing speed drastically. We find that PCNN, MPCNN method are connecting and feeding field for colourful image.

5. Chen, Zhensong, 2015[9] The purpose k-means and Fuzzy c-means both methods are capable towards produce a divide images under conditions including cluster number and for recovering cluster algorithms using this algorithm we find out cluster number and centres. For varify dc for the similar input image will generate mutually constant output.K-means and Fuzzy c-means both methods are capable to produce a divide images under conditions including cluster number and centres. In this paper we find cluster number and centres depend on decision graph, these are collected with distance and density.

6. Nan Li et al. (2013) [12] By using canny edge detection method from the image finds adaptive threshold vlaue and edge extraction operations are performed. Both clustering methods fuzzy-c means method and means shift approach provide better results in canny edge detection. In this research paper we find that both methods fuzzy-c means and means shift approach provide better results in canny edge detection. Both methods fuzzy-c means and means shift approach provide better results in canny edge detection. But still some problems are there related to edge detection.

7. Hore, Sirshendu, 2016[6] In this paper ostu's method, Iterative method and thresholding are used to achieve the best possible threshold value. And in this also defined the homogeneity based on pixels intensity. The result is based on parameters(F-score, precision,recall). To measure the result proposed method match with qualitative analysis considered as ground truth and ideal edge. Upto this paper we find that in this thresholding method traverse neighbourhood pixels around seed location to perform the region grow algorithm of two- dimentional seeded. but still some defects exist when find the intensity between current pixel and neighbouring pixels.

8. Senthilkumaran, N., and R. Rajesh,2009.[4] Using soft computing technique improve the efficiency of image segmentations. Soft computing techniques (Genetic algorithms, fuzzy logic, ANN) are implemented on real life examples and output illustrate the efficiency of image segmentation. Using soft computing techniques we find that the result shows efficiency of images segmentation. But in this paper still some problems related to efficiency of image segmentations when we applied soft computing techniques.

9. M Radha, R , Muthukrishnan 2011, [26] The main purpose is edge detection to identifies the correct image without noise from the original image using discontinuity intensity level. This edge detection technique identifies the correct image without noise. The edge detection method based on discontinuity intensity level. In this paper we find that edge detection discontinuity intensity level remove the noise.but the main problem still in this paper is related to discontinuity intensity and overlapping objects.

10. Li, L., Kang, W., Sun,L., Guo, J.,Han,C. & Li, S,2016 [11] In this paper Kapur's entropy is same as optimal objective function, Gray wolf optimizer by modified as tool and used fuzzy membership functions for local information aggregation. The experiment result define multi-level thresholding is improved. because difficult object fuctions solved by nondeterministic methods. In this paper define multi-level thresholding but complex objective functions which are solvable only by nondeterministic methods.

11. Bhandari, Ashish Kumar, et al, 2016 [18] Cuckoo search(CS), Wind driven optimization(WDO) are two algorithms used for multilevel thresholding. These are two swarm-intelligence based algorithms used to overcome problems which are related to thresholding. Kaptur's entropy reveal that the two algorithms WDO and CS be able to efficiently and accurately used in problems which are related to multilevel thresholding. Both algorithms WDO and CS be able to efficiently and accurately used in problems which are related to multilevel thresholding but researchers find still there are some problems left in multilevel thresholding.

12. Ghoshale et al. (2013) [17] Mainly watershed algorithm is applied for describing different types of edge sharpening filters along with find out impact on output images. For better result they use particular morphology for filtering and organizing elements used for smoothing shape, and remove hole. We find that watershed is new segmentation technique in which combine pre-processing and post-processing of image objects to generate final output result.

13. Mr.M.C.& J Mehena [27] designed of edge detection study & computer vision medical image edge detection is an significant job for object recognition of human organs. They are used to solving a problem of image segmentation. The image segmentation is one of the most difficult tasks in image &computer vision discontinuity. Discontinuity that mean of not a matching exact output of image.

Chapter 3

SCOPE OF STUDY

This proposed work in this thesis is having a set of potential for advance research in the part of edge detection using different soft computing techniques creation the job more adaptable and flexible. The research able to be complete in the area of noisy images directly as input in the methodology presented in this work. Also the proposed work can be further studied examining the different parameter variations and enclosure of some dynamic problem sensing feature which can adjust the parameter values to the values optimal for the specific situation. For image segmentation edge detection is most significant technique for to detect the edges. A numerous of types of soft computing techniques are used in image segmentation like neural networks, fuzzy logic, genetic algorithm and swarm intelligence. Soft computing could be basis mechanisms for the developing field of artificial intelligence. In soft computing swarm intelligence is different and new term based on the behavioral form of social insects such as ants, bees, wasps, termites etc. The produced by both search methods were practically matching as like neural network, genetic algorithm, optimization, fuzzy logy concept. The scope of field help full of soft computing approaches medical fields, automatic digital field surveillance, computer vision and artificial intelligent field in the scope of future aim. The scope of information short description analysis of optimized we are using suitable tool.

Soft computing might be practical as source elements for developing field of artificial intelligence.

In future work we try to improved image edge detection using swarm intelligence techniques such as Artificial Bee colony, Ant colony optimization etc would be raise more optimum edge detection system , structure edge than the gradient detector used however as well would be other unreceptive to noise than a Laplacian edge detector. By study we get that the image edge detection for medical images using Swarm intelligence algorithm has an advantage over conventional edge detection techniques. By changeable a few parameters like λ, α, and β provide the enhancement in image edge detection. Implemented results illustrate the possibility of the approach in identifying edges in an image. Through appropriate parameter values, the algorithm will able to successfully identify edges.

Chapter 4

OBJECTIVES OF THE STUDY

1. To enhance edge detection we categorize the different edge pattern used for different image class.
2. Analysis of soft computing algorithms for optimized output.
3. Improve the performance of edge detection based on swarm intelligence which fairly detects the edges of every kind of images with enhanced quality, moreover by means of a low failing probability in detecting edges.
4. Design for optimized approach for image segmentation.
5. Implementation of designed approach.

Chapter 5

RESEARCH METHODOLOGY

The design of model of the work is depicted in following steps:

1. Arrange for the edge specific Data input.
2. Extract the actual review related to edge.
3. Firstly remove noise from original image after that apply edge detection.
4. Apply different type of swarm intelligence techniques like PSO, ACO and ABC etc.
5. Perform edge detection using one swarm intelligence optimization technique to obtain optimum result.

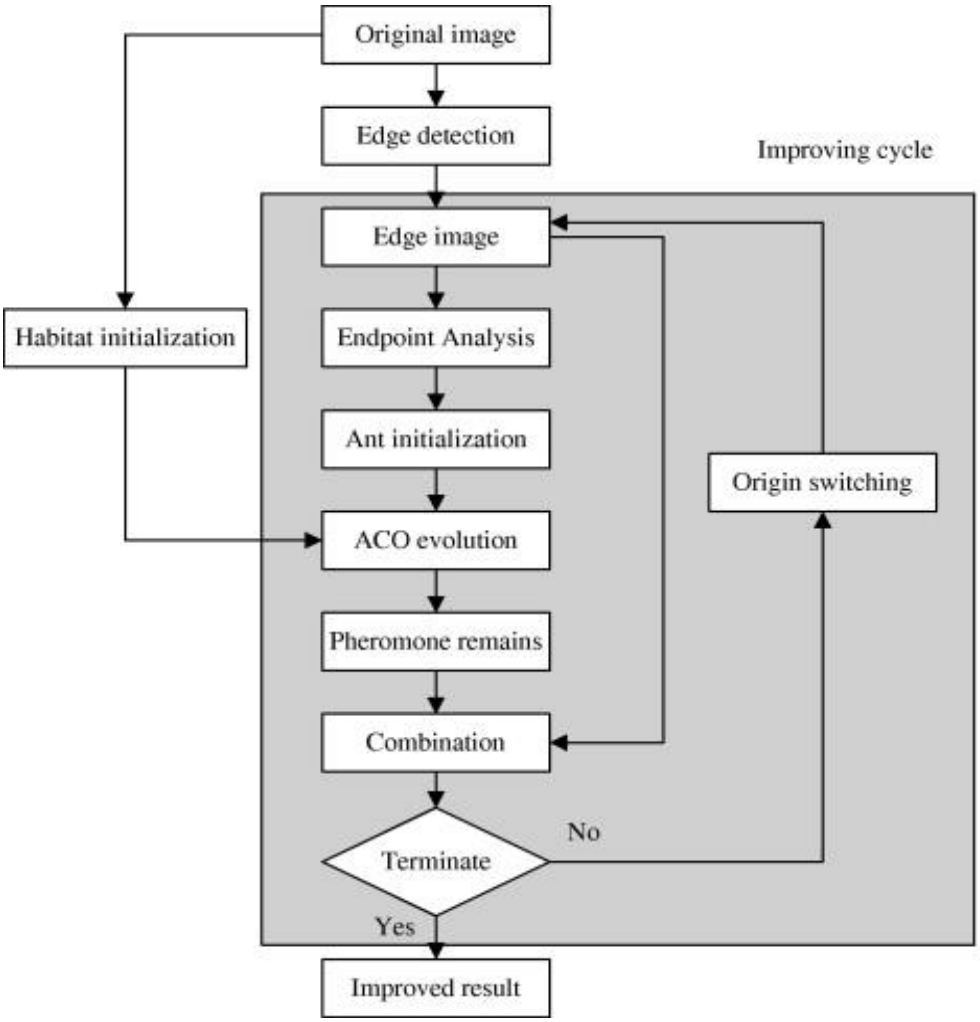

Fig 5.1 methodology of edge detection using soft computing techniques[21]

Chapter 6

EXPECTED OUTCOME

1. In expected outcome we categorize the edge patterns into different classes using soft computing techniques. The data set learns the data in training sets & user gives the output. The result is accurate.
2. The algorithm will able to successfully identify edges by using swarm intelligence algorithms over conventional edge detection methods.
3. The images obtained is compared with other conventional edge detectors images and it is seen that the proposed approach is quite immune to noise and at the same time provides good edge maps.

Chapter 7

SUMMARY & CONCLUSIONS

This research conclusion of "Area of interest reorganization from medical images using soft computing techniques" soft computing has been introduced into medical image processing because it is an efficient process to manage uncertainties inherent in acquiring image data. The segmentations techniques mainly are based on Edge and boundary. In segmentation, simply represent the image into more understandable noise free form. Segmentation generally used to identify the boundaries, regions, objects and other relevant data in the digital image. These segmentation methods are applied on image processing describe in brief. The major focus on learn soft computing techniques to deal with detect edges for image segmentation. We done survey on segmentation techniques such as edge detection, region growing, thresholding and Soft computing techniques such as fuzzy logic, genetic algorithm, AAN, swarm intelligence, evolutionary computing. Soft computing methods implemented on a real life example image of environment take action and the effects illustrate the efficiency of image segmentation. It is most important to identify the modifications among edge detection methods. All the segmentation techniques described in this report paper are further used in numerous advanced tasks and implementation.

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