Detection Of Nasal Dermoid Using Enhanced Intelligent Water Drop Algorithm

[1]**Neeraj Singla,** [2] **Sugandha Sharma**

1. M.Tech Student,

2. Assistent professor,

ABSTRACT: *Diagnosis of the disease is a crucial problem in the medical field. Nasal dermoid cysts are rare congenital midline nasal masses. and sugery is very complicated after baby's birth so my work is early detected disease so no need of surgery. In this work we will used canny edge detector so that the nasal dermoid could be easily detected. my main work is to early detection of nasal dermoid cyst by using canny edge detector apply Roi during pregnancy ultrasound scanning under intelligent early disease detector water droplet algorithm. An edge may be defined as a set of connected pixels that forms a boundary between two disjoints regions. Edge detection is basically, a method of segmenting an image into regions of discontinuity. Edge detection plays an important role in digital image processing and practical aspects of our life. we have studied various edge detection techniques as Prewitt, Robert, Sobel, Canny operators. On comparing them we can see that canny edge detector performs better than all other edge detectors on various aspects such as it is adaptive in nature, performs better for noisy image, gives sharp edges , low probability of detecting false edges etc.*

KEYWORDS: Edges, Edge detection, canny edge detection, water droplet algorithm, dermoid cyst

I. INTRODUCTION

A Dermoid cyst is a saclike growth that is present at birth. it contains structures such as hair, fluid, teeth, or skin glands that can be found on or in the skin. an edge may be defined as a set of connected pixels that forms a boundary between two disjoints regions. edge detection is basically, a method of segmenting an image into regions of discontinuity. edge detection plays an important role in digital image processing and practical aspects of our life. .in this paper we studied various edge detection techniques as prewitt, robert, sobel and canny operators. on comparing them we can see that sobel edge detector performs better than all other edge detectors on various aspects such as it is adaptive in nature, performs better for noisy image, gives sharp edges , low probability of detecting false edges etc. iwd algorithm used only for solving traveling salesman problem, vehicle routing or many problems but not used in medical field for detection disease till yet, so i change some steps from basic iwd algorithm and develop new algorithm to early detect nasal cyst . no of iteration are 100 in new algorithm ,but in previous travelling salesman problem using iwd have only 10 iteration, in this we have using ROI -Region of interest for just focused on nasal, in this sobel edge detector used because it gives better results in medical field to detect cyst. main objective biological   early   detection of nasal dermoid cyst by using sobel edge detector apply ROI during pregnancy ultrasound scanning under intelligent early disease detector water droplet algorithm. using sobel edge detector or ROI apply on the medical image under this new algorithm cyst early detected. Sobel edge detector gives better results so this will be used in thesis work. Region of interest is just focused on nose in medical image rather than other region. Using intelligent water drop algorithm nasal cyst early detect because its surgery is very complicated.

II. LITERATURE SURVEY

1. El-Owny et al. in the paper entitled "A New Edge Detection Algorithm for Medical Images" proposed Edge detection in medical images is an important task for object recognition of the human organs and it is an important pre-processing step in medical image segmentation. The performance of proposed method is compared against other methods such as Sobel and Canny edge detector by using various tested images. Experimental results reveal that the proposed method exhibits better performance and may efficiently be used for the detection of edges in image (El-Owny, Hassan Badry Mohamed A. [1]).

2. Priyanka et al. in their paper "A Review on Brain Tumor Detection Using Edge Detection" described the concept of Brain tumor is an abnormal mass of tissue in which some cells grow and multiply uncontrollably, apparently unregulated by the mechanisms that control normal cells. These techniques use the MRI Scanned Images to detect the tumor in the brain. Differences between some well-known techniques are also considered in this paper.(Priyanka, Balwinder Singh[2])

3. Arpana M. Kop et al. in their paper "Kidney stone detection from Ultrasound Images using Gradient Vector Force" described the concept of Ultrasonography is said to be the safest technique in medical imaging and is hence used extensively. The intensity images are input to the method and a GVF snake is initialized. The snake deforms and finally reveals the contour of the kidney. The proposed method has successfully segmented the kidney part from the ultrasound images. (Arpana M. Kop, Ravindra Hegadi [3]).

4. Vikas Wasson et al. in their paper "Prostate Boundary Detection from Ultrasound Images using Ant Colony Optimization" described the concept of   Prostate Cancer & diseases is quite common in elderly men. Early detection of prostate cancer is very essential for the success of treatment. In this paper, a new method based on Ant Colony Optimization is proposed, which will increase efficiency & minimize user involvement in prostate boundary detection from ultrasound images.(Vikas Wasson, Baljit Singh[4]).

5.   Bhadauria H S et al. in their paper " Wavelet and Canny Based Edge Detection Method for Noisy Lung CT Image" This paper proposed a new edge detection algorithm based on wavelet transform and canny operator. In the wavelet domain, the low-frequency edges are detected by canny operator, while the high-frequency edges are detected by solving the maximum points of local wavelet coefficient model to restore edges after reducing the noise by wavelet. Then, both sub-images edges are fused according to fusion rules. A noisy CT image of abnormal lung infected by Honeycombing is used to evaluate the performance of algorithms. (Bhadauria H S, Singh A [5])

6. Dr. S. K. Mahendran   in their paper " A Comparative Study on Edge Detection Algorithms for Computer Aided Fracture Detection Systems" described the concept of X-Ray is one the oldest and frequently used devices, as they are non-invasive, painless and economical. Owing to the important role played by edge detectors, this paper compares the various traditional edge detectors available, namely, canny, sobel, prewit, Log and Roberts. Experiments were carried out to analyze their performance and suitability for detecting edges in x-ray images (Dr. S. K. Mahendran [6])

7. Y. Zeng et al.   in their paper "Fuzzy-set Based Fast Edge Detection of Medical Image" described the concept of Edge information or contours related to the object of interest bear important information about that object in an image. The detection of edges is also a key step for further processing of images using techniques such as object recognition, segmentation and 3D reconstruction.However, these techniques may fail to succeed due to factors such as high grey level alterations because of noise and discontinuity of edge areas originating from the nature of imaging modalities. (Y. Zeng , C. Tu, X. Zhang [7])

III. PROBLEM FORMULATION

As we know that diagnosis of the disease is a crucial problem in the medical field. Nasal dermoid cysts are rare congenital midline nasal masses. And surgery is very complicated after baby's birth so work is early detected disease so no need of surgery. Sobel Edge Detector and Region of interest be used so that the nasal dermoid cyst is easily detected. Main work is to early detection of nasal dermoid cyst by using sobel edge detector apply Region of interest on ultrasound image during pregnancy scanning under intelligent water drop algorithm. in First step we have selected medical disease with named nasal because no of cases be increased day by days as suggested by doctors . this nasal dermoid cyst problem be more in new born baby and after baby's birth its nasal surgery is very complicated so the basic work is early detection of nasal dermoid cyst during pregnancy scanning so it should be detected in early stage . This dermoid problem is suggested by my guide because they personally faced this dermoid problem in ovarian. so this work be really useful in medical field and safe somebody life. For detection of nasal dermoid cyst sobel edge detector be used because sobel edge detector be gives better results in the medical field to detect nasal cyst. Region of interest be apply in medical ultrasound image to just focus on nasal rather than other part of body. Intelligent water droplet algorithm be applied on ultrasound image to detect cyst in early stage. Watershed transform also be used in my work for obtained better results. this is best artificial intelligence technique to choose best solution for this problem.

IV. OBJECTIVE / METHODOLOGY

OBJECTIVES:
1. sobel edge detector be used on ultrasound medical image of pregnancy scanning time and this detector be gives better results in medical field to detect cyst in the earlier stage so need of complicated surgery .

2. Region of interest be used for just focused on nose in ultrasound medical image during pregnancy scanning rather than other region of body.

3. Intelligent water drop algorithm nasal cyst be early detected in ultrasound images during pregnancy scanning by using this algorithm. its early detection is very necessary because nasal surgery is very complicated.

 METHODOLOGY:
Nasal dermoid cyst: The differential diagnosis of midline nasal masses includes inflammatory lesions, post-traumatic deformities, benign neoplasm, and malignant neoplasm, congenital and vascular masses. Midline congenital lesions of the nose are rare congenital anomalies. Their incidence is estimated at 1 per 20,000 to 40,000 births consisting of gliomas, encephaloceles, and nasal dermoid sinus cysts. Nasal dermoid sinus cysts account for 1−3% of dermoid cysts overall and 11−12% of head and neck dermoids.

Intelligent water droplet algorithm: this algorithm be the best algorithm for selecting the best solution or helps them to early detect the nasal cyst. the basic intelligent water drop algorithm be used to solved many problems And find the best path. this algorithm be really efficient in the medical field to detect diseases in early stages and this is best artificial intelligence technique. so we will used this algorithm.

Sobel edge detector: sobel edge detector be the best edge detector in the medical field to detect cyst disease at earlier stage .

Region of interest: A Region of interest is a portion of an image that you want to filter or perform some other operation on. You define an region of interest by creating a binary mask, which is a binary image that is the same size as the image you want to process with pixels that define the Region of interest set to 1 and all other pixels set to 0. The regions can be geographic in nature, such as polygons that encompass contiguous pixels, or they can be defined by a range of intensities. So region of interest be used in the medical field to detect the cyst like we have detect nasal cyst during pregnancy ultrasound scanning so apply region of interest on the ultrasound image so one circle is made on nasal where the cyst occurred so it will really helpful in the medical field to detect cyst.
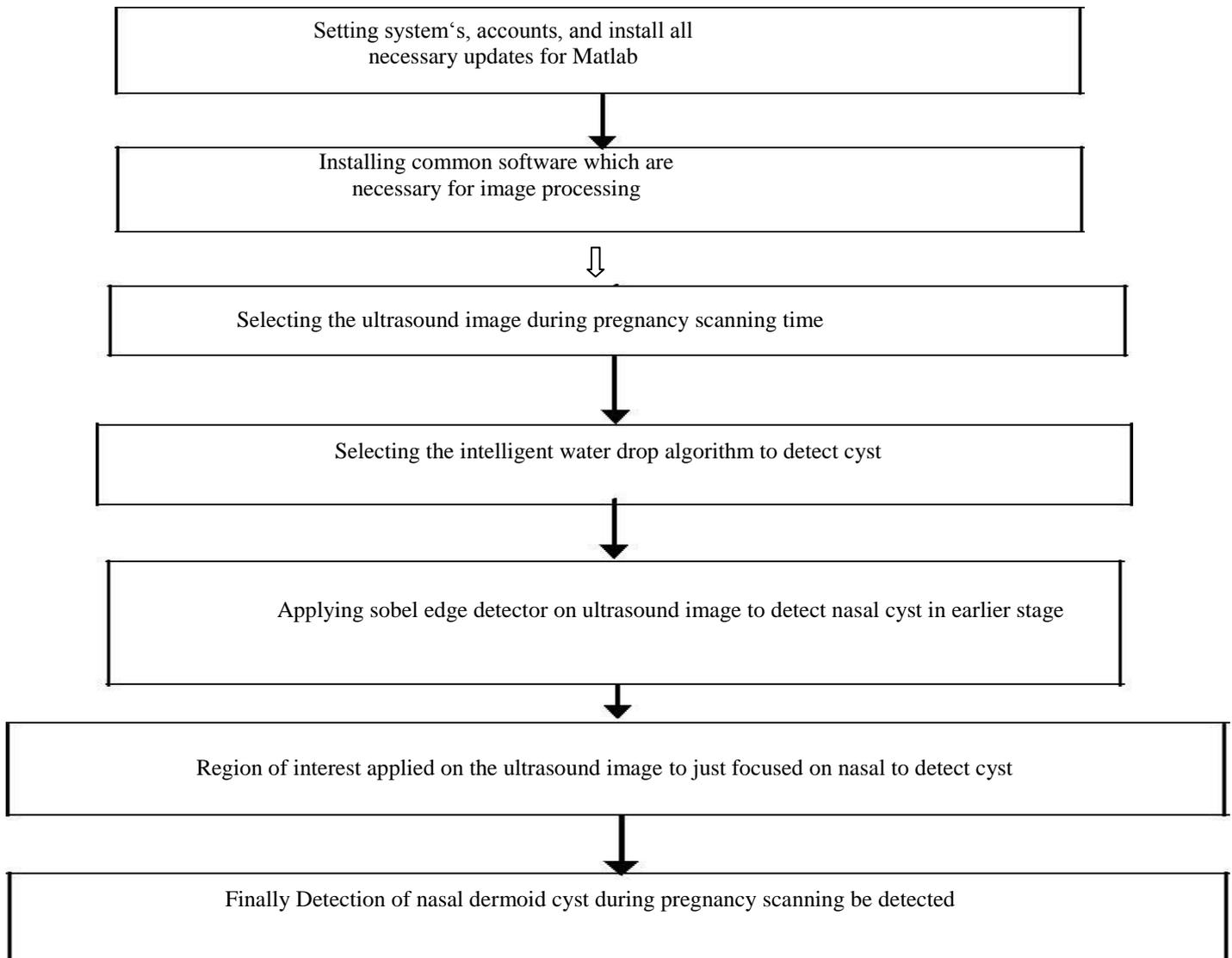
V. FLOW CHART

Setting system's, accounts, and install all necessary updates for Matlab

⬇

Installing common software which are necessary for image processing

⬇

Selecting the ultrasound image during pregnancy scanning time

⬇

Selecting the intelligent water drop algorithm to detect cyst

⬇

Applying sobel edge detector on ultrasound image to detect nasal cyst in earlier stage

⬇

Region of interest applied on the ultrasound image to just focused on nasal to detect cyst

⬇

Finally Detection of nasal dermoid cyst during pregnancy scanning be detected

Figure 4.1 describes the step by step process to early detect the nasal cyst during pregnancy scanning.

VI. PROPOSED ALGORITHM-ENHANCED INTELLIGENT WATERDROP ALGORITHM

1. Image acquistion - in the first step we have select an ultrasound image.
2. Convert ultrasound image into double data type to make the processing easy.
3. Apply watershied transform for decomposition of an image.
4. Apply efficient sobel edge detection method on an original image.
5. Extract features--- edges, partioned image, segmented image by algorihm.
6. Apply iwd for segmentation of image. It contain no of steps:
    1. Inilitize waterdrops--- iterations be counted
    2. Soil--- no of pixels in an segmentated image at every iterations.
    3. Velocity-- saturation value be counted.
7. Under every iteration soil content of an image is recovered and give best segmentated value.
8. Soil content decomposition vary acc to velocity . Repeat Step --- 7 or 8
9. Best segmenteted image is obtained consider ROI segment method an extract same from segmented image.
10. Region of interest be applied on image for detection just on nasal.

VII. EXPERIMENT RESULT

Experimental results of ultrasound images for early detection of nasal dermoid cyst during pregnancy scanning using sobel edge detector or region of interest. Sobel edge detector is used in my work because it gives better results than other edge detectors. Because it really useful in detection of diseases in medical field and its accuracy is more than other edge detectors. Region of interest be used to just focus on nasal rather than other part of body. So in Matlab environment you have selected a circle or polygon as per your choice and set the ultrasound image. So by help of sobel edge detector or region of interest being using in my work and its gives good results. intelligent water drop algorithm perform a great role in detection of nasal cyst because it's a best artificial intelligence techniques. watershed transform also be used to find better results in detection of cyst. we compared the sobel edge detector with other edge detector and found that canny gives better results . its accuracy of image is more than the others and take less execution time so we will prefer that sobel edge detector to early detect the nasal cyst.

IMPLEMENTATION UNDER MATLAB

Matrix Laboratory: MATLAB is a program for doing numerical computation. It was originally designed for solving linear algebra type problems using matrices. It's name is derived from Matrix Laboratory. MATLAB has since been expanded and now has built-in functions for solving problems requiring data analysis, signal processing, optimization.
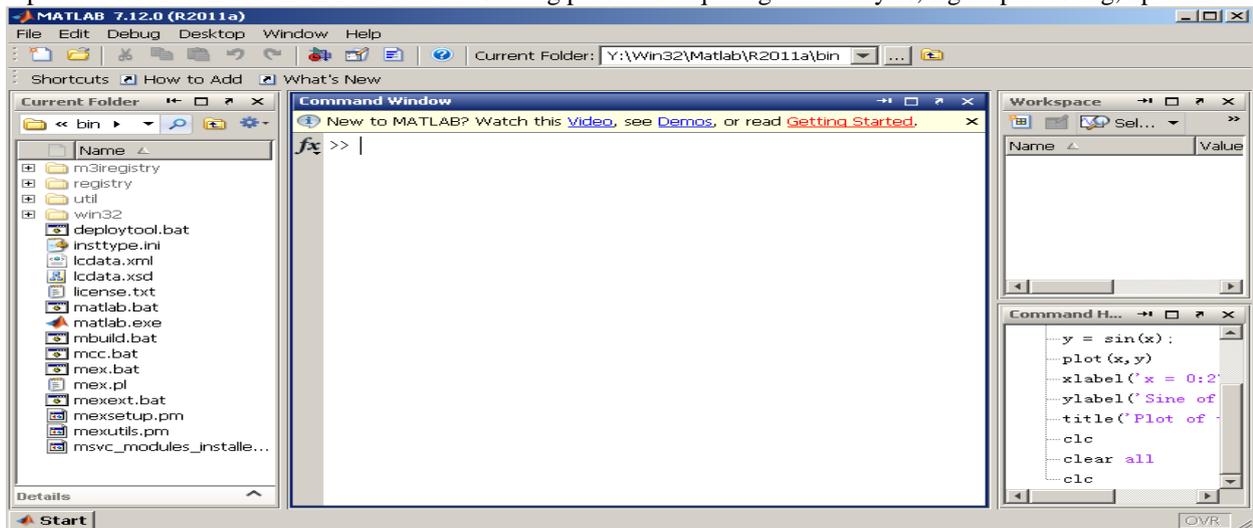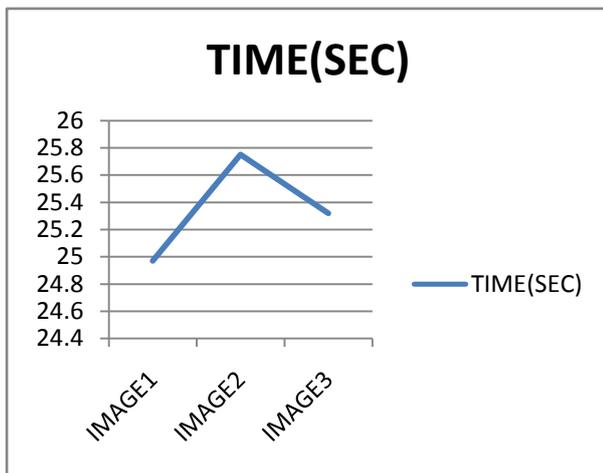

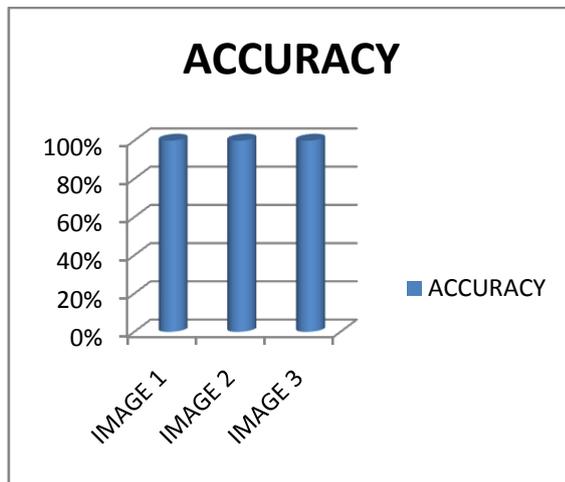
SNAP SHOT: DETECTION OF NASAL DERMOID CYST
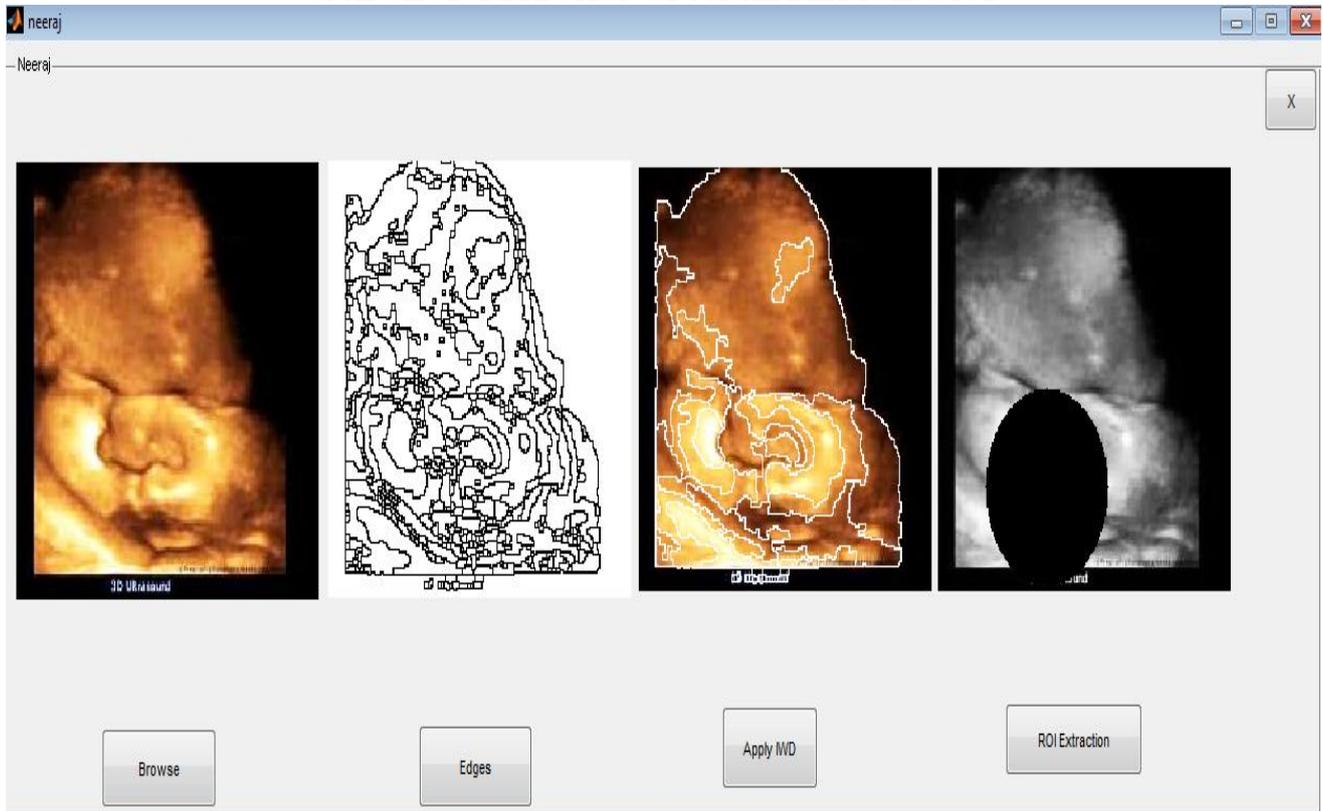
RESULTS:
Under Implementation we have selected two parameters one is accuracy and other is time complexity.

Images	Accuracy	Time complexity
Image 1	100%	24.97 sec
Image 2	100%	25.75 sec
Image 3	100%	25.44 sec

GRAPH   - TIME

GRAPH - ACCURACY

VII. CONCLUSION /FUTURE SCOPE

CONCLUSION

Early detection of nasal dermoid cyst during pregnancy scanning is very necessary because after pregnancy baby's nasal surgery is very complicated. Nasal dermoid cyst is early detected by intelligent water drop algorithm using sobel edge detector because it gives better results in disease detection during pregnancy scanning .Region of interest used so its just focused on nasal rather than other part of baby. So Nasal early detection is very necessary in earlier stage during pregnancy scanning. Watershed transform be used in thesis work for getting better results. So at last this work is really helpful in medical field.

FUTURE SCOPE

The existing work can be enhanced by considering the following points:
1.   Better Artificial intelligence techniques be used in the future for getting more better results .
2.   The proposed implementation has been developed using Matlab. In future this system can be
         implemented in by other good language for finding more better results.
3.   ifferent edge detectors be used for the detection of diseases in medical field.

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BIOGRAPHY

ER. NEERAJ SINGLA, pursuing M.Tech -CSE from CGC, Gharuan and done B.Tech. degree from Punjab technical university. He is author of 9   international journals.

ER. SUGANDHA SHARMA is working as Assistant professor in CGC Gharuan in CSE department .. She completed her M.E in Computer Science and Engineering from University Institute of Engineering and Technology, Panjab University in 2010. She is Author of EIGHT International Journals. Fields of Specialization is Image Processing.