

## Radiology Assessment by Image Processing Techniques

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### ABSTRACT

Beside sciences and technologies progresses by high quality, processing medical imaging is the most prominent ,because of high attract to showing internal structures of human body. Also medical images are presecure to health lookout, medical and instruction researches .Medical imaging has many opportunity for health improvement by technology and increasing nonaggressive way to show inside technology. suggest survey and explanation to distinct health and disease .distinction tolls in this system are image processing improved. accuracy, property and sensitivity have assessed. relationship between suggested system by images in Databases are meaningful. In presented system, have offered away to specificate broking in radiology image.

**KEYWORDS:** radiology images, assessment, edge discovery, edge manifest.

### 1. INTRODUCTION

First time ancient Greece doctor Hippocrates discovered a way to assess body temperature which has same analogy to nowadays thermograph ways and an figure this the most ancient way to assessment imaging (Keevil, 2012). about one century, radiology images are put on radiography film and can be assessed, and digital images hasn't any success in this way. however some bases has been prepared to others courses like as analog picturing from second half of twentieth century, but medicine picturing hasn't accept presented images format.

Information and relationship technology have seriously changed all organizations. healthy organization have been changed after information and relationship presentation too. nonetheless, unlike to these, presentation of service quality with quality and budget preservation are hopeful, but those results in this course are very far.

Radiology: this is a basic course of medicine which use glow and X-ray to disease assessment and curement. currently radiology term is called to unisan rays ways. But now are merged by no rays images like as MRI and Sonography and medical imaging at clinical course are almost same (Wilhelm Kirch, 2008).

Radiologist: they are specialists which are using arrays or imaging technologies(like as ultrasound or Sonography) C.T.scan (nuclear medicine, tomography, or section recording) by positron emission and magnetic accent imaging or magnetic resonance imaging to assessment and curement.

Image analyze and processing can be called as a technical and usage structure to capture, correction, increasing and changing images. The purpose of this procedure is to increase respective information quality which in future will be derived . changing really is a procedure on input images until output is a number from image. different imaging techniques are accessed, however information processing techniques used to vast procedures which can be used to different formats and figures Fig.1.

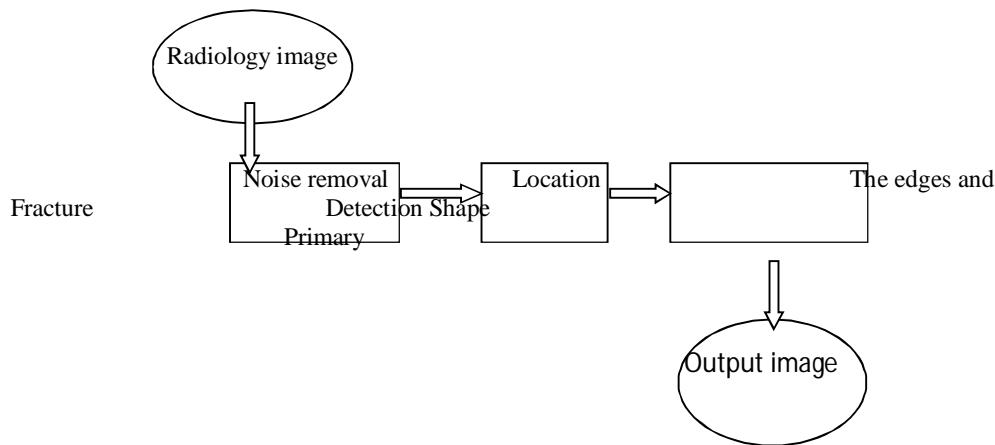


Fig.1. Graph structure of the proposed model

First images which gathered, are specifcated, corrected to delete waving, then processing is a way to make excellence. new techniques or process to solve specific occasion which choose between different usage. image processing was done by different layers. Way and techniques in all layers are same and image processing ways in health preservation are resulted from other processing ways in different sciences and industry. General stage and algorithm in figure(Fig. 1) have been impressed. Purpose of this essay is a report to assess radiology images for external doctors from radiology wards. This report is included of ideas and comment from main elements in patient document and include of important information which can help to making decision and or assessment from doctor sight.

## 2.traditional ways

Skills in radiography explanation can be gotten by experiment. There is no short way to know physical signs or get skill in radiographies explanation.

If radiography film is studied by methodic ways on routine standard, then correct explanation will be more easy. Although malformation will be dissembled lower than the time when one person view radiographies hopefully but randomly.

- Sub stage by radiologists or doctors to assessment radiography films in traditional way:
- take out films from cover and put them on a flat surface
- put film on the negatoscope in anatomic way(non anatomic ways can make mistake).
- pay attention to date on the film and investigate regularly.
- pay attention to make sure about which part of body and from which scene pictured.
- to view general bone density, be away from negatoscope and by their experience make decision which they are normal, decreased or increased.
- to investigate any local change in density, make closer view on film.
- cortex of any bone are controlled, view border of bones and then cutting in continues of cortex and erratic parts, changing tissues or bone forming.
- trace changing in tissues and rotten parts or scleroses.
- view joints, trace making slimy in joint space, making roughly in joint surface, forming new bones in free environment and bodies.

Tissues are investigated until viewable[3].

These presented stages are used in whole of the country in a traditional way.

## 3.Investigation way

### 3.1.finding borders

Manifesting borders, is one of the most useful technics in image processing which derivate fundamental parameters like as main from of image. The way of finding by matrix operator grian from finding pixels which their light severity has sudden changes to other close pixels(Yu Zhang Noriko, 2007). Usually this technic use first step offshoot operator and second step to pixel. first step offshoot pixel can be addressed their light severity bigger than threshold. It is visible in same part and second offshoot operator is to find contact points with zero.

If main image shows with  $f(x, y)$ .first step offshoot include  $\frac{\partial f}{\partial x}$  and  $\frac{\partial f}{\partial y}$ . pixel grian(x,y) is  $\nabla \bar{f}(x, y)$  which have shown in equation[5,6].

$$\nabla \bar{f} = \begin{bmatrix} G_x \\ G_y \end{bmatrix} \begin{bmatrix} \frac{\partial f}{\partial x} \\ \frac{\partial f}{\partial y} \end{bmatrix} \quad (1)$$

Which  $G_x$  and  $G_y$  in gradient course is about x axis and y axis and gradient operator scale is showed in equation:

$$\nabla f = [G_x^2 + G_y^2]^{1/2} \quad (2)$$

in cutting spaces x and y variables are exchanged by quantized m and n cutting which show pixel position in image although gradient are counted by equation:

$$\nabla f = \sqrt{f_x(m, n)^2 + f_y(m, n)^2} \quad (3)$$

Which  $f_x$  and  $f_y$  are gradient about x and y axis and result are got from equation:

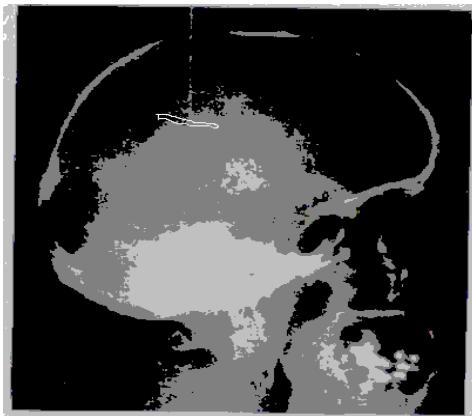
$$\begin{aligned} f_x(m, n) &= f(m, n) * h_x(m, n) \\ f_y(m, n) &= f(m, n) * h_y(m, n) \end{aligned} \quad (4)$$

In this equation  $h_x$  and  $h_y$  are two filters to off shooting about x and y axis.

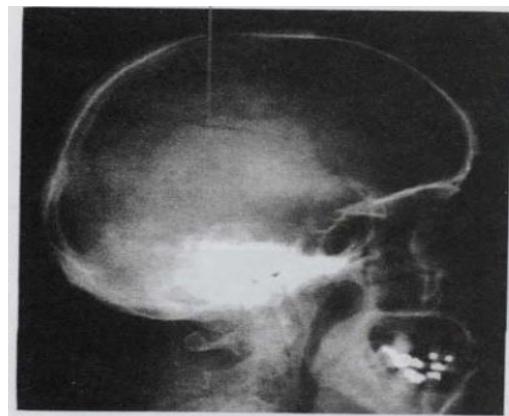
### 3.2.Assessment doubtful fracture parts

Fig.2. is an image of skull which hasn't any sign of fracture, although need more accuracy to distinction process although its basic parameters of skull image filter to other words however fracture centralize to internal face ,then light severity must progress about border pixels to center. By morphological building images we make a circle by increasing radius which by counting light severities find same as it self then by repeating in searching radius increases too and by finding target pixel ,all pixels between them ,have new light severity like as border pixels.

By putting thresholds like as Fig.3. and by filtering algorithm from an image border to another one in Fig.4. result will be Fig.2. and by pixel relationship progress about border we get Fig.6. in internal face.



**Fig.3.** Image thresholding for separation of the fracture



**Fig.2.** Input image of skull radiography



**Fig.5.** Removal of the attached image edge fracture



**Fig.4.** Edge detection of isolated fractures



**Fig.6.** broken image hole fill

#### 4.changing gray fracture light severity spectrum to color spectrum

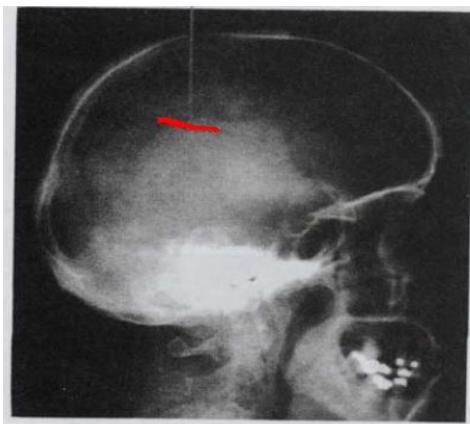
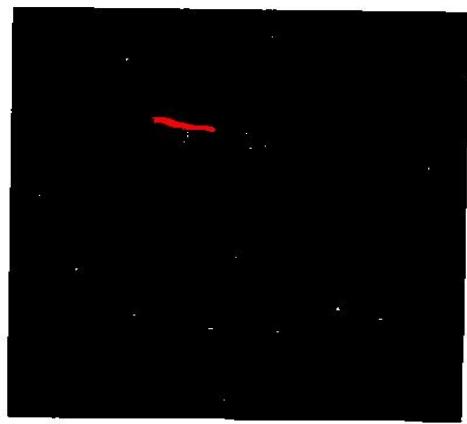
accurate to graphical show about fractures and explanation its site, we change gray light severity spectrum to one of the R-G-B spectrums elucidate.

This process center of fracture to doctor. For having a particular color spectrum its enough to change gray light severity to a light severity by one parameter. Here is red color and red address fracture.

In next step by result matrix from fracture in logical or binary matrix, we go to image after preprocess stage. If we call this image M and color matrix t the equation will be(5):

$$M(t)=0 \quad (5)$$

Thus all M matrix points are same as t zero points, remains and other parameters will be zero in figure(Fig. 8) final from of fracture site and image resulted from preprocessing figure(Fig. 7) will be showed.

**Fig.8.** The combination of a sharp**Fig.7.** a fracture in red color image with the location of the fracture

## 5.RESULTS

If images can be recorded in a data base, to research about digital imaging like as image processing, image misgiving, showing image, image archive and connection systems can help PC to assessment.

When database prepare, one of the most database properties is radiologists operation to assessment malformation in database. By using this database overage radiologists operation which has precious in formation can match their operation to other radiologists.

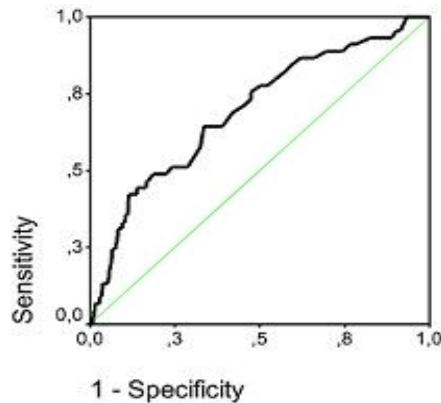
This suggested procedure in this essay by 150 radiology image test from evaluating database. They have 55 micron resolution and 103 image surely has fracture and in others doubt fully show their sites.

Accuracy, property and sensitivity are checked in this offspring way. By 150 image test from database shape in radiology image and match it by suggested system by 57/4 % to 99.1% accuracy. Fracture sites had been known by radiologists and specialists by gathered radiology Images, also fracture are wholly explanted.

operation property chart are known by ROC graphs.

Rounds are appropriate to investigate quality and operation Roc rounds in medical procedures need making decision and partening and making category, are usage.

By using this round which is a ZD round and X axis is positive mistake changes and closer to 1 are more succeeded[7,8] Fig.9. is a round about ROC in this technic.

**Fig.9.** graph curves ROC

## 6.DISCUSSION

Fracture is one of the most widespread accidents which liably accrued to any one, in this essay when any malformation is finded, Dissemble film may gain mistake, which in a film may find two or more distinct malformation and radiologist or doctors in radiography checks must pay much time until don't conduct with pronto dedication which suggest new way on radiology images processing. This technic definite accurate site of fractures and distinct wholly fractures from other image parts and increase quality and light of them then fracture diet in one radiology image adjusted transparently by high accuracy. By this technic, it is decreased human mistakes in fracture assessment.

But there is a problem to present this technic ,because of using first time in Iran. no doctor or hospital don't want use this system. And doctors believe that this technic decrease their income, if fealth organization supply this technic, we make a good help to doctors Society and putinet.

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