

الآية

قال تعالى:

قُلْ لَوْ كَانَ الْبَحْرُ مِدَادًا لِكَلِمَاتِ
رَبِّي لَنَفِدَ الْبَحْرُ قَبْلَ أَنْ تَنْفَدَ
{كَلِمَاتُ رَبِّي وَلَوْ جِئْنَا بِمِثْلِهِ مَدَدًا}

سورة الكهف الآية 109

Dedication

This research is dedicated to

My dear father

My dear mother

**My Brothers & sisters Source
of support in my life and my
fiancé**

Acknowledgment

I would like to take this opportunity to express my profound gratitude and deep regard to Dr. Mohamed Elfadil Mohamed, for his exemplary guidance, valuable feedback and constant encouragement throughout the duration of the project. His valuable suggestions were of immense help throughout my project work. His perceptive criticism kept me working to make this project in a much better way. Working under him was an extremely knowledgeable experience for me. And also thank everyone who helped me to complete this search

Abstract

Advanced technologies in image processing and analysis are used extensively in x-ray image, working to improve X ray images, image data are used to gather details from location of the diseases or physiological processes. This study aims to enhance chest x-ray images using image processing technique where IDL program were used as platform to enhance the quality of the images, The sampling of this study consists of 50 patients who underwent chest x-ray image, the study was conducted and taking information from Modern Medical Center, data were collected in the period between December 2014 to May 2015. IDL program techniques such as histogram equalization, filtering an image with mean filter, are used on this study to analyzed and enhanced data (chest x-ray images). The study showed a significant difference between the original image and the image that processed using IDL techniques, in term of contrast by histogram equalization. The contrast was significantly increased and it was the mean before enhancement 0.78 and it became after enhancement 0.97, and the mean of the contrast before filter

enhancement was 0.70 and it became after filter enhancement 0.90. Also there were significant reduction in noise and it was the mean in high intensity area before enhancement 5.18323 and it was reduced when were used the mean filter to 3.37592, and the mean of the noise was in low intensity area before enhancement 1.70899 and it was reduced to 1.22766. The mean of the signal in high intensity area before enhancement 7367 and it became 7382, and the mean of the signal in low intensity area before enhancement 1685 and it became 1630, and the mean of SNR in high intensity area before enhancement was 1421.31 and it became 2264.65, and the mean of SNR in low intensity area before enhancement was 536.195 and it became 511.648.

الخلاصة

التقنيات المتقدمة في معالجة الصور و تحليلها تستخدم على نطاق واسع في صور الأشعة السينية و ذلك لانها تعمل على تحسين صور الأشعة السينية بشكل كبير جدا أيضا يمكنها فصل المعلومات المطلوبة عن باقي الصورة , وتستخدم بيانات الصورة لجمع تفاصيل عن مكان وجود الأمراض أو العمليات الفيسيولوجية. هذه الدراسة تهدف الي تحسين صور الأشعة السينية للصدر بإستخدام تقنيات معالجة الصور حيث تم إستخدام برنامج آي دي آل كمنصة لتحسين جودة الصور. عينات هذه الدراسة تتكون من 50 مرضى خضعوا لتصوير الصدر بالأشعة السينية ، قد أجريت هذه الدراسة وأخذت المعلومات من المركز الطبي الحديث، وقد تم جمع البيانات في الفترة ما بين ديسمبر 2014 إلى مايو 2015. تقنيات برنامج آي دي آل مثل تسوية الرسم البياني ، ترشيح الصورة بالمرشح المتوسط

،يستخدمون في هذه الدراسة لتحليل وتحسين البيانات (صور الأشعة السينية للصدر). أظهرت الدراسة وجود فرق كبير بين الصورة الأصلية والصورة التي عولجت باستخدام تقنيات آي دي آل،في مصطلح التباين بواسطة تسوية الرسم البياني. تمت زيادة التباين بشكل كبير وكان المتوسط قبل التحسين 0.78 وقد أصبح بعد التحسين 0.97، وكان متوسط التباين قبل التحسين بالمرشح 0.70 وقد أصبح بعد التحسين بالمرشح 0.90.أيضا كان هناك إنخفاض كبير في الضوضاء وكان متوسطها في منطقة الكثافة العالية قبل التحسين 5.18323 وقد خفضت عندما أستخدم المرشح المتوسط إلى 3.37592، وكان متوسط الضوضاء في منطقة الكثافة المنخفضة قبل التحسين 1.70899 وقد إنخفضت إلى 1.22766.متوسط الإشارة في منطقة الكثافة العالية قبل التحسين 7367 وقد أصبحت 7382،ومتوسط الإشارة في منطقة الكثافة المنخفضة قبل التحسين 1685 وقد أصبحت 1630. وكان متوسط SNR في منطقة الكثافة العالية قبل التحسين 1421.31 وأصبح 2264.65، ومتوسط SNR في منطقة الكثافة المنخفضة قبل التحسين 536.195 وأصبح 511.648.

List of Abbreviations

CXR

chest x ray

PA	posterior-anterior
LL	latero-lateral
Y	gamma rays
FOV	field of view
RGB	red green blue
IDL	interactive data language
MSE	mean square error
RMSE	root mean square error
PSNR	peak signal to noise ratio
AD	average difference
BPNN	feed forward back
propagation neural networks	
SVM	support vector machine
NB	naive bayes
MRI	magnetic resonance imaging
TB	tuberculosis patients
CT	computed tomography
DIP	digital image processing
HE	histogram equalization
AHE	adaptive histogram
equalization	
CLAHE	contrast limited adaptive
histogram equalization	

SNR	signal to noise ratio
LOG	laplacian-of-a- gaussian
HVS	human visual system
PC	personal computer
CR	computed radiograph
STD	standard deviation

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