

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

## قال تعالى:

رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي أَنْعَمْتَ  
عَلَيَّ وَعَلَىٰ وَالِدَيَّ وَأَنْ أَعْمَلَ صَالِحًا تَرْضَاهُ  
﴿وَأَدْخِلْنِي بِرَحْمَتِكَ فِي عِبَادِكَ الصَّالِحِينَ﴾

﴿سورة النمل الآية 19﴾

# Dedication

If gifting express even a part of the fulfillment of

The gifting

To

Human teacher and the source of our science Prophet Muhammad  
(peace be upon him)

To .....

Such as fatherhood Supreme ... Dear Dad

To ....

Habiba my heart first ... Lamy compassionate spirit

To ....

Tenderness source.. Dad to all people ... grand father dear

To ....

Love all the love .... my sisters and my brothers and uncles and  
their wives and aunts

To

All friends and family

To

Of paved road in front of me to get to the peak of science

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### **Abstract:**

Advanced technologies in image processing and analysis are used extensively in nuclear medicine, working to improve nuclear medicine image, image data are used gather details from

location of the diseases or physiological processes . This study aims to enhancement of bone scintigraphy image by using image processing technique and have been using MatLab program is used to enhance the quality of the image , The random sampling consist of 5 patient who underwent bone scintigraphy scan ,the study was conducted and taking information from Niles center for nuclear medicine, data were collected in the period between November2014 to March 2015. MATLAB program technique such as Contrast-limited adaptive histogram equalization (CLAHE), histogram equalization, Adjust image intensity values or colormap , 2-D median filtering and contrast stretch image , are used on this study to analyzed and Enhanced data (bone scan image ) .This study showing significant difference between the original image and the image that processed using MATLAB techniques , in terms of Contrast especially in homogeneous areas and had been avoided the amplifying of any noise that might be present in the image by(CLAHE) ,extracting of the foreground from the background by using histogram as guide for threshold Value and enhance the Contrast of image (bone scan) by using histogram code and contrast stretch image, the Adjust image code used to enhance the image by increasing of contrast , the reduce of the " salt and pepper " noise by using 2-D median filtering , median filter was more effective than convolution when the goal is simultaneously reduce noise and preserve edges .

## المخلص:

التقنيات المتقدمة في معالجة الصور وتحليلها تستخدم على نطاق واسع في الطب النووي، وذلك لأنها تعمل على تحسين صورة الطب النووي بشكل كبير جداً و أيضاً يمكنها فصل جميع المعلومات المطلوبة عن باقي الصورة

وتستخدم بيانات الصورة لجمع تفاصيل عن مكان وجود أمراض أو العمليات الفيزيولوجية. هذه الدراسة تهدف إلى تحسين صور فحص العظام الومضاني باستخدام تقنيات معالجة الصور و قد تم استخدام برنامج الماتلاب لتحسين جودة الصور، تم اخذ عينات عشوائية تتكون من 5 مرضى خضعوا للفحص الومضي للعظام ، و قد تمت الدراسة وأخذت المعلومات من مركز النيلين للطب النووي، و تم جمع البيانات في الفترة الواحدة بين نوفمبر 2014 إلى مارس 2015. وتقنيات تحسين الصور الموجودة في برنامج الماتلاب مثل معادلة تباين تكيف الرسم البياني المحدودة ، معادلة التمثيل البياني ، وضبط صورة قيم الكثافة أو خارطة الألوان، تباين الصورة الممتد. و قد استخدمت في هذه الدراسة لتحليل و تعزيز البيانات (صورة فحص العظام). هذه الدراسة تظهر الفرق الكبير بين الصورة الأصلية والصورة التي معالجتها باستخدام تقنيات الماتلاب ، من حيث التباين وخاصة في المناطق المتجانسة و تجنببت تضخيم أي الضوضاء قد تكون موجودة في الصورة عن طريق استخدام (م ت ا) وفصلت المقدمة من الخلفية باستخدام تقنية الرسم البياني كدليل لقيمة العتبة و تم تعزيز التباين البيانات (صور فحص العظام) باستخدام تقنية معادلة الرسم البياني، وأيضاً تعزيز (صور فحص العظام) من خلال زيادة التباين في الصورة باستخدام تقنية ضبط الصورة وتم خفض الضوضاء " الملح والفلل " باستخدام 2-د متوسط الترشيح وهذا المرشح أكثر فعالية من الالتواء عندما يكون الهدف هو الحد من الضوضاء والحفاظ على الحواف في وقت واحد.

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## List of Abbreviations:

<i>CT</i>	Computed Tomography
<i>MRI</i>	Magnetic Resonance Imaging
FBP	Filtered Back-Projection
MDP	Methylo-Di-Phosphonate
SPECT	Single-photon emission computed tomography
PET	Positron Emission Tomography
CLAHE	Contrast-limited adaptive histogram equalization
DMSA	De-Methylo-Sulfo-Acid
DEXA or DXA	Dual-energy X-ray absorptiometry
RGB	Red, Green and Blue