

Sudan University of Science and Technology

College of Post Graduated Studies



Automatic Data Extraction in Computed Tomography

Images Using Morphology Matching filtering

*A thesis submitted for Partial fulfillment of Academic Requirements of M.Sc. in
Medical Physics*

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قال تعالى:

بسم الله الرحمن الرحيم

(اَعْمَلُوا آلَ دَاوُدَ شُكْرًا وَقَدْ يَلِ مِنْ عِبَادِي الشُّكُّورُ)

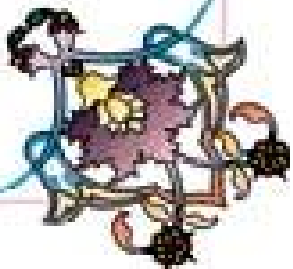
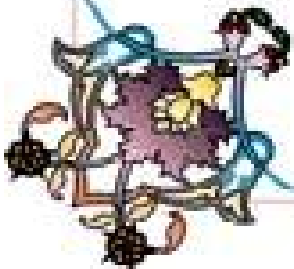
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Dedication

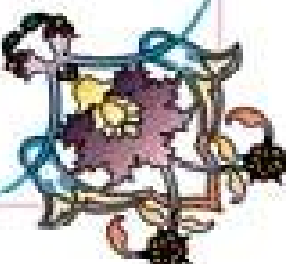
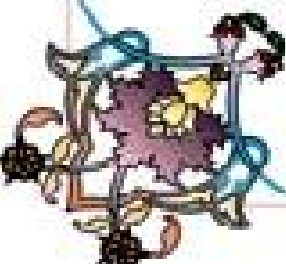
With my truthful appreciation and love I dedicate this work to my familymy mother and father, who deserve my all life.....my husband and sons support me.....my teachers & friends.





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First of all, I would like to thank ALLAH, and all I want to express my sincere gratefulness to my supervisor **Dr. Yousif Mohamed Yousif Abdallah** for his great efforts & times. I appreciate my husband and family for their assistant, finally I want to thank everyone who help or support me in this research.



Abstract

This experimental study was conducted to study automatic data extraction in computed tomography images using morphology matching filtering using MatLab program. The objectives of this study were to evaluate contrast enhancement pattern in different computed tomography images as such. In addition to evaluate the usage of new nonlinear approach for contrast enhancement of soft tissues in computed tomography images in order to study automatic extraction of lung tissues. Thus the lung CT image is subjected to various processing steps and features are extracted for a set of images. Pre-processing is to improve their quality of images. If these images are too noisy or blurred they should be filtered and sharpened. In this thesis the following programming steps were used firstly preservation of image's overall look; secondly preservation of the diagnostic content in the image and thirdly detection of small low contrast details in diagnostic content of the image. The new approach is funded on an attempt to interpret the problem from the view of blind source separation (BSS), thus to see the panoramic image as a simple mixture of background information, diagnostic information and noise. The median filter is normally used to reduce noise in an image, somewhat like the mean filter. The processing steps include thresholding, morphological operations and feature extraction. By using these steps the lungs are detected and some features are extracted. The extracted features are tabulated for future classification.

الخلاصة

أجريت هذه الدراسة التجريبية لدراسة استخراج البيانات التلقائي في صور الأشعة المقطعية باستخدام تقنية مطابقة الشكل الخارجي. هدفت هذه الدراسة لتقييم نمط تعزيز التباين في مختلف صور الأشعة المقطعية. بالإضافة إلى تقييم استخدام انماط غير خطية جديدة لتعزيز التباين من الأنسجة الرخوة في صور الأشعة المقطعية من أجل دراسة الاستخراج التلقائي لأنسجة الرئة وبالتالي يتم تعريض صور الأشعة المقطعية للرئة لخطوات المعالجة المختلفة ويتم استخراج ميزات مختلفة لمجموعة من الصور .

المعالجة الأولية تحسين جودة من الصور إذا كانت هذه الصور هي مشوشة جدا أو غير واضحة ينبغي تصفيتها وصلها في هذه الأطروحة استخدمت خطوات البرمجة الآتية: أولا الحفاظ على النظرة الشاملة للصورة؛ ثانيا الحفاظ على المحتويات التشخيصية في الصورة، وثالثا الكشف عن التفاصيل الصغيرة المنخفضة النقيض في المحتوى التشخيص من الصورة ويتم تمويل هذا النهج الجديد على محاولة لتفسير المشكلة من وجهة نظر الفصل الأعمى للمصدر، وبالتالي لرؤية الصورة على شكل مزيج بسيط من المعلومات الأساسية، معلومات تشخيصية والوضوءاء. يتم استخدام مرشح المتوسط عادة للحد من التشويش في الصورة، الى حد ما مثل مرشح المتوسط وتشمل الخطوات معالجة مستوى العتبة، العمليات المورفولوجية واستخراج الميزات باستخدام هذه الخطوات يتم الكشف عن الرئتين ويتم استخراج بعض الميزات المستخرجة يتم جدولتها للتصنيف في المستقبل.

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