

Abstract

This study is an attempt to study the liver CT Scan images using Texture Analysis Techniques and hence the main objective of this study was to characterize the liver tissues in an CT Scan images into three classes which includes; fatty, cirrhosis and normal tissue types by using texture analysis. The texture were extracted from spatial gray level dependence matrix using a window of 20×20 pixels of angle zero and distance equal one pixel. The images were collected from 60 patients represents the classes of the study in the period from 6/2011 to 10/2012. Then the textural features were extracted from selected sub-images that showed only the class of interest. The classification technique were adopted as a method of pattern identification the images into three classes. A linear discriminant analysis using stepwise were used to classify the sample into the predefined classes. The stepwise selected 9 features out of fifteen features as the most discriminant features; they included: Entropy, energy, inertia, inverse difference moment, difference entropy, sum variance, difference variance and variance of (SGLD)matrix. The result of this study showed that the total classification accuracy was 93.3%, with an accuracy of 85.1% 98.4% and 94.9% for fatty, cirrhosis and normal respectively

الخلاصة

هذه الدراسة هي محاولة لدراسة صور الكبد بالأشعة المقطعية باستخدام تقنيات الكمبيوتر لإنشاء برامج تساعد في التشخيص وبالتالي فإن الهدف الرئيسي من هذه الدراسة هو

تحديد خصائص أنسجة الكبد في صور الأشعة المقطعية الي ثلاث فئات وهي

تشمل: الدهنية, تليف الكبد والأنسجة الطبيعية, باستخدام مميزات احصائية توصف النسيج . تم استخراج مميزات توصيف النسيج من مصفوفه الاعتماد علي مستوي اللون الرمادي باستخدام نافذة 20×20 بكسل بزاوية صفر ومسافة واحد بكسل . وقد تم جمع الصور من 60 مريض وتمثل مجموعات الدراسة في الفترة من 2/2011 الي 6/2012 . وتمت قراءة وتحديد هذه الصور من قبل

اخصائيين خبيرين في مجال الأشعة المقطعية حيث تم قبول القراءة في حالة الاتفاق بينهما , تم

استخراج الملامح التكوينية من تحديد الأماكن المختاره من الصور التي تظهر فقط الفئة المطلوبه . تم

اعتماد تقنية التصنيف كوسيله لتحديد نمط فئة الصوره وذلك الي ثلاث فئات محدد , وتم اختيار

9 مميزات توصيفيه من اصل 15 كأفضل مميزات توصيف . وظهرت نتائج هذه الدراسة ان مجموع

دقة التصنيف كانت 93.3% مع دقة 85.1%, 98.4%, 94.9% للفئات الدهنيه , تليف الكبد

. والعاديه علي التوالي .

Dedication

To whom I love

To whom I care about

Acknowledgment

Great thanks and grace to Allah for guidance helping me finishing this research.

My deep thanks and grateful appreciation extend to my teacher and supervisor Dr. Mohammed Elfadil who help me with full patience, support, advices and real sharing throughout this thesis and without his help this work could not have been accomplished.

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