

: قال تعالى

شَهِدَ اللَّهُ أَنَّهُ لَا إِلَهَ إِلَّا هُوَ وَالْمَلَائِكَةُ وَأُولُو الْعِلْمِ قَائِمًا ﴿١٨﴾

﴿بِالْقِسْطِ^ج لَا إِلَهَ إِلَّا هُوَ الْعَزِيزُ الْحَكِيمُ

﴿سورة آل عمران الآية ١٨﴾

Dedication

To doses of the cup blank to give me a
drop of love

To those of the fingers to give us a
moment of happiness

To reap the thorns out of my way for me to
pave the way science

To heart the great my father

Of whom breastfed of love and healing
balm my Mother

To the heart as pure whiteness my family
and to all my friends

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deepest gratitude to

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I also would like to thanks My brother
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Alameen for their support .

Deep thanks to my family for their consistent
mental support finally ,

I would like to thanks my friend .

Abstract

The aim of study to characterize Hepatocellular carcinoma (HCC) in CT images using higher order statistic and Daubechies wavelet based on texture analysis. for classification and delineation of the HCC and normal liver, spine and ribs, and it's a method to improve the accuracy of the diagnosis and to reduce the number of required invasive procedures.

This study was conducted at five hospitals Darelaj specialized hospital, Alnilein Medical Diagnostic Center, Modern Medical Center and Royal care international hospital in Khartoum state during the period May 2014 to September 2016.

The study sample included 180 patients with Hepatocellular (HCC) carcinoma underwent abdominal CT Images, from both gender.

For higher order statistic the texture reveals a different underlying pattern of the HCC compared to the liver and other abdominal tissues with classification sensitivity 98.8%, and the combination of the texture features throughout the different triple phase image phases provides the highest predictive overall accuracy of 85.4 % using stepwise linear discriminant analysis.

The Daubechies wavelet measures the gray level variations in a CT images, and it complements the coefficient of Daubechies wavelet Features extracted from the coefficient can be used to estimate the size distribution of the sub patterns. The Daubechies wavelet and its features seem very useful in texture classification. The classification accuracy of hepatocellular carcinoma 97.1 %, liver accuracy 91.7 %, While the spine and ribs showed a classification accuracy of 97.1, 91.2 % respectively.

This study proposed that texture analysis is superior to visual perception system where texture revealed that change and the difference of the image pattern objectively in respect to the ground truth.

ملخص البحث

تهدف هذه الدراسة الي توصيف سرطان الخلية الكبدية في صورة الاشعة

المقطعية باستخدام الاوامر الاحصائية العليا و لتصنيف و تحديد

سرطان الخلية الكبدية عن باقي مكونات صورة الاشعة المقطعية. و الغرض من

ذلك ان تكون

هناك طريقة موضوعية لتحسين دقة التشخيص و الحد من الاجرات الخطرة

.التي تستخدم عادة في تشخيص المرض

وقد اشتملت الدراسة علي 180 مريضاً تم تشخيصهم بمرض سرطان الخلية

الكبدية بعد خضوعهم للاختبار الاشعة المقطعية للبطن ، وقد اجريت هذه الدراسة

.علي الجنسين

الاوامر الاحصائية العليا تعطي قدرة تفريق عالية بين الانسجة لسرطان الخلية

الكبدية وباقي انسجة البطن مع حساسية تصنيف تصل حتي 98.8% و بادخال

خصائص تحليلية طوال مراحل مختلفة للصورة ثلاثية الاطوار تعطي دقة تنبؤية

اعلي ، وقد تصل حساسية التصنيف عموماً حتي 85.4% باستخدام تدرج تحليل

.التمايز الخطي

و باستخدام موجات دابوشيز لقياس الاختلاف في مستوى الرمادية

بالنسبة لصورة الاشعة المقطعية استخرجنا معامل الموجات لقياس

.خصائص الصورة لتقدير حجم التوزيع بالنسبة للانماط الفرعية

وصلت حساسية التصنيف بالنسبة لسرطان الخلية الكبدية الي 97.1% و

دقة التعرف علي الكبد 91.7% ، ووصلت حساسية التصنيف العامة حتي

94.2%.

تعطي نظام ادراك بصري قادر علي الكشف اوضحت هذه الدراسة ان

الاوامر الاحصائية العليا و موجات دابوشيز

.عن التغيير والاختلاف في نمط الصورة

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List of abbreviation

HCC	Hepatocellular Carcinoma
ROI	Region of Interest
CT	Computed Tomography
MRI	Magnetic Resonance Images
US	Ultrasound
MDCT	Multi Detector Computed Tomography
CAD	Comuted Aided Design
WGO	World Gastroenterology Organization
FNH	Focal Nodular hyperplasia
GLRLM	Gray Level Run Length Matrix
GLCM	Gray Level Co-occurrence Matrix
DNA	Deoxyribonucleic acid
AFP	Alpha Fetoprotein
ICRU	International Commission on Radiation Units & Measurements
PACS	A picture archiving and communication system
DICOM	Digital Imaging and Communications in Medicine
CWT	Continuous wavelet transform
GA	Genetic Algorithm
NNs	Neural Networks
GTSDM	Grey-Tone Spatial Dependence Matrix

