بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

A 3D RECONSTRUCTION OF PULMONARY NODULES FROM 2D CT IMAGES COMPUTER AIDED DIAGNOSIS BASED SYSTEM

By

Eng. Ayat Motawakkel Karrar Ahmed

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of

DOCTOR OF PHILOSOPHY
in
BIOMEDICAL ENGINEERING AND SYSTEMS

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
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Under the Supervision of

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Title of Thesis:
A 3D Reconstruction Of Pulmonary Nodules From 2d CT Images Computer Aided Diagnosis Based System

Key Words:
Deep learning, Maximum Intensity Projection, 3D Reconstruction, K-Nearest Neighbor; Random Over Sampling.

Summary:
Lung cancer is one of the most serious cancers in the world with the minimum survival rate. Lung nodules may be isolated from (solitary) or attached to (juxtapleural) other. In this paper a Computer Aided Diagnosis system is proposed to classify between solitary nodule and juxtapleural nodule inside the lungs. Two main auto-diagnostic schemes of supervised learning for classification are achieved. Three segmentation approaches are proposed. The three classifiers of the first scheme are K-Nearest Neighborhood, Artificial Neural Network and Support Vector Machine. In the second scheme, Deep Convolutional neural networks are used. Because of limited data sample and imbalanced data, 10-fold cross validation and random oversampling are used. The 3D reconstruction of pulmonary nodules based on the surface rendering technique and visualization by 3D slicer are achieved.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Ayat Motawakkel Karrar Date: …. /…. / 2021

Signature:

Acknowledgment

A major research like this is never the work of anyone alone. The contributions of many different people, in their different ways, have made this possible. I would like to extend my appreciation especially to the following:

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TABLE OF CONTENTS

List of Tables

List of Figures