



Supervised Pattern Recognition

"Case Study on Using Pattern Recognition System for Providing Second Opinion in the Diagnosis of Breast Cancer"

A thesis submitted in partial fulfillment of the requirements for the
Master Degree in Applied Statistics

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Muhamed Wael Farouq

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿وَمَا تَوْفِيقِي إِلَّا
بِاللَّهِ عَلَيْهِ تَوَكَّلْتُ
وَإِلَيْهِ أُنِيبُ﴾

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

إهداء

إنني أتشرف بإهداء هذا العمل المتواضع

إلى معلمي الأول

إلى ينبوع الحنان الذي لا ينضب

إلى مثال الإرادة والصبر والتحمل

إلى من كنت أتمنى أن يشاركني هذه اللحظات

وأرى الابتسامة تملأ وجهه الجميل

وتملأ معي حياتي بالسعادة والأمل

إلى أبي

"اللهم اغفر له وارحمه واسكنه فسيح جناتك واجعل قبره

روضة من رياض الجنة... اللهم ارزقه الفردوس الأعلى....اللهم إنني

دعوتك كما أمرتني فاستجب لي كما وعدتني"

اللهم آمين... آمين

وائل



كلية التجارة
قسم الإحصاء والرياضة والتأمين

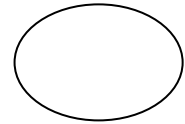
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List of Abbreviation

ACS	: American cancer society.
AI	: Artificial intelligence.
ANN	: Artificial neural networks.
BPTT	: Back – propagation through time.
CAD	: Computer aided detection / diagnosis.
CBE	: Clinical breast examination.
CO_POINT	: Concave points.
COMPACT	: Compactness.
DDSM	: Digital database for screening mammography.
EM	: Electromagnetic.
FDA	: Food and drug administration (U.S.A. dept of health and human sciences).
FN	: False negative.
FNA	: Fine needle aspirate.
FP	: False positive.
MAE	: Mean absolute error.
MANOVA	: Multivariate analysis of variance.
MFNN	: Multi – layer feedforward neural network.
ML	: Machine learning.
MLPs	: Multilayer perceptrons.
MRI	: Magnetic resonance imaging.
MSE	: Mean square error.
NCI	: National cancer institute
WDBC	: Wisconsin diagnostic breast cancer.
SMOOTH	: Smoothness.

Chapter One

Introduction