بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائق الاصلية تالفة

بالرسالة صفحات لم ترد بالاصل

MANSOURA UNIVERSITY
FACULTY OF ENGINEERING
DEPT. OF ELECTRONICS AND COMMUNICATION

APPLICATION OF ARTIFICIAL NEURAL NETWORKS IN PATTERN RECOGNITION

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF THE MASTER DEGREE OF SCIENCE IN COMMUNICATION ENGINEERING

BY

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B.Sc. OF ELECTRONICS ENGINEERING

SUPERVISED BY

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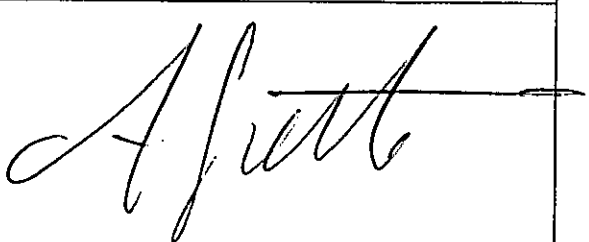
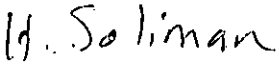
PROF. DR. ABD.ELFATTAH IBRAHEEM	
DR. HASSAN H. SOLIMAN	

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Mohamed awad

Appriviations

C.C.D.	: - Connected Components Detector
N.O.C.	: - Number Of Changes
N.N.	: - Neural Networks
BP.	: - BackPropagation
R.S.	: - Recognition System
H	: - Horizontal
V	: - Vertical
+45	: - Positive 45
-45	: - Negative 45
TOT.	: - Total

ABSTRACT

This thesis introduces new techniques for Arabic handwritten character recognition systems. First of them is C.C.D. (Connected Components Detector), which is applied on Japanese handwritten characters [5], and is applied for the first time on Arabic handwritten characters in this thesis. C.C.D. is based on transforming the original character image to 4 sub-images. These 4 sub-images are the results of vertical, horizontal, +45, and –45 scans of the original image. C.C.D. Feature extraction procedure is applied on each sub-image, which is counting the number of connected (successive) components with the same type i.e. number of 1's and number of 0's in each raw then save that results in a matrices which represents the features extracted.

Second technique is called N.O.C. (Number Of Changes) detector. This technique is newly applied in the field of character recognition at all. It is based on detecting number of changes, from 1 to 0 or vice versa, through horizontal, vertical, +45 and –45 scans in addition to counting the number of each successive N.O.C.'s which is expressed as the "lengths" of those N.O.C.'s.

Both C.C.D. and N.O.C. features are fed to neural networks for recognition.

New clustering techniques are also applied in this thesis. This means differentiation between characters according to certain features as a first stage before applying neural networks as a second stage. Both classifiers are expected to be new ideas in clustering techniques.

First classifier classifies between characters according to basic features like number of parts, number of holes and the position of small objects, like dots and "hamza", in relative to the main object.

The second classifier is based on detecting number of changes, from 1 to 0 or vice versa, through horizontal and vertical scans. The resulting vectors from horizontal and vertical scans may contain certain unique N.O.C.s that used in clustering characters.

TABLE OF CONTENTS