بسم اللّه الرحمن الرحيم

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

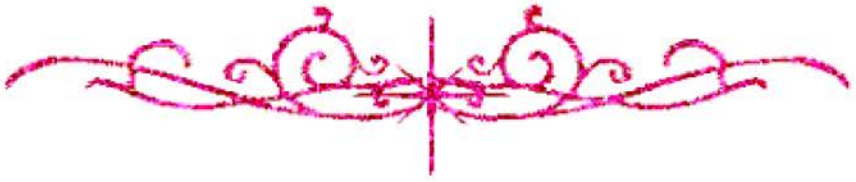
قسم

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



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بعض الوثائق الأصلية تالفة

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شبكة المعلومات الجامعية

بالرسالة صفحات

لم ترد بالأصل

HOSSAM MAGHRABY

ZAGAZIG UNIVERSITY-BANHA BRANCH
FACULTY OF ENGINEERING-SHOUBRA

Using Neural Networks In Pattern Classification

A THESIS SUBMITTED TO THE
FACULTY OF ENGINEERING-SHOUBRA
ZAGAZIG UNIVERSITY-BANHA BRANCH
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF SCIENCE

By
Eng. Mohamed Sami Abbass

Supervised by:

Prof. Mona F. M. Mursi
Electrical Eng. Dept.- Faculty of Engineering

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Electrical Eng. Dept.- Faculty of Engineering

Dr. Hala H. Zayed
Electrical Eng. Dept.- Faculty of Engineering

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Abstract

Biometric identification systems have been developed to achieve automatic identification of a person based on his physiological or behavioral characteristics. Biometric systems are critical in a wide range of applications such as banking systems, E-commerce, smart cards, and access control to secure systems. Automatic fingerprint identification is one of the most reliable biometric systems, which is used for identifying persons. In this thesis, our objective is to design a fingerprint identification system, which is capable of identifying a fingerprint with high level of accuracy. Therefore, this system can be applied to a wide range of forensic applications.

In this research, we proposed a complete fingerprint identification system. The system is composed of the following stages: (i) Fingerprint image preprocessing, in which we proposed a new algorithm to detect the center point of the fingerprint and construct a normalized image for the sectors surrounding the center point. The proposed center point detection algorithm was tested in comparison with previously published algorithms and proven to be more accurate and faster. (ii) Feature extraction, in which we used a bank of Gabor filters to capture both the local and global details of the fingerprint and convert them into a relatively short and fixed length code for the purpose of matching. (iii) Identification using neural networks, in which a back-propagation neural network was used to identify an input fingerprint image from the system database. We performed several tests using different values for the parameters of the neural network in order to reach to the best results.

The proposed system has been evaluated on a system database that contains live-scan fingerprints. The system was able to identify an input fingerprint with an accuracy of 96.67%. On the other hand it did not misidentified any input fingerprint. These results were compared with two other identification systems and the proposed system proven to give better results in both the False Acceptance Rate (FAR) and the False Rejection Rate (FRR). These results show that the proposed system can be accepted as an accurate identification system.

بسم الله الرحمن الرحيم

" و ما أوتيتم من العلم إلا قليلا "

صدق الله العظيم

DEDICATED TO

MY FAMILY

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