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شبكة المعلومات الجامعية

# بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



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شبكة المعلومات الجامعية



# شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



سامية محمد مصطفى



شبكة المعلومات الجامعية

# جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
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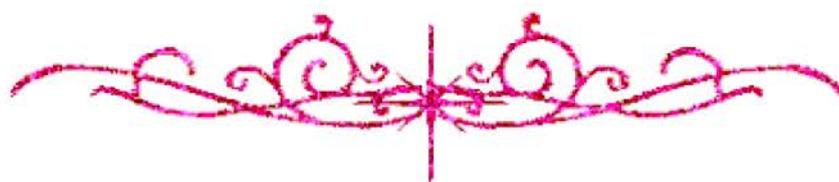


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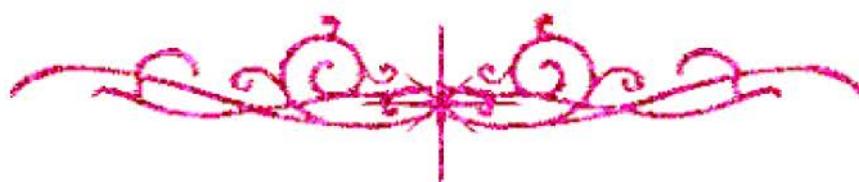
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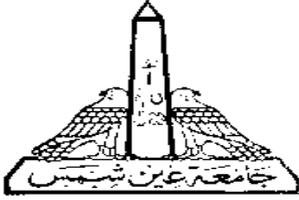


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# بعض الوثائق الأصلية تالفة





AIN SHAMS UNIVERSITY

FACULTY OF ENGINEERING

*Computer Engineering and Systems*

## **Signature Recognition and Verification System**

A Research Submitted as a partial fulfilment of requirements of the Master of  
Science Degree In Electrical Engineering

(Computer Engineering and Systems )

By

**Ali Khaleel Ibrahim Hammadi**

Bachelor of Science In Electrical Engineering

(Computer Engineering and Systems ) Department

College of Engineering, Madinat Alelem University, 2013

Supervised By

**Prof. Dr.** Hoda Korashy Mohamed

**Dr.** Hossam E. Abd El Munim

Cairo - 2019



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# Statement

This research is submitted as a partial fulfilment of Master of Science in Electrical Engineering, Faculty of Engineering, Ain shams University .

The research comprise in the research is carried out by author, where no part of it has been submitted or qualified for a Degree on other scientific aspect.

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## **ABSTRACT**

Handwriting signature is one of important discriminative features of every person. It is used in different authentication fields such as signing the papers of bank. Also, the employees in the organizations need to have specific signatures that recognize them from the other people. Recognizing and verifying the signatures of those people is not trivial problem because there are several challenges associated with accurate and reliable recognition of these signatures. The variation in the number of signatures for each person is the most challenging problem. In this thesis, we have a new approach developed for online recognition of signature and verification using Speed up robust feature( SURF), Bag of word (BOW) and Support of vector machine (SVM) , Neural network(Multi layer-perceptron)NN(MLP) algorithms. The SURF algorithm is used to specify invariant key points and descriptors for online signatures while SVM, NN (MLP) algorithm is used for classification purposes using linear and nonlinear kernels. In addition, BOW algorithm is used for dictionary in order to appear the strongest features depending on its repetition. Feature extraction, recognition and verification are the key elements in the proposed approach for online signatures. JAVA, VC++ programming languages is used to implement our approach. Also, ORACAL database is used in our approach to store information about all persons in the online signature recognition system. The results prove practically, where the superiority and effectiveness of proposed approach by providing 98.75 % in RBF and 96.76% in NN recognition accuracy.

Keywords: SURF, BOW, SVM, NN, online signature recognition

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