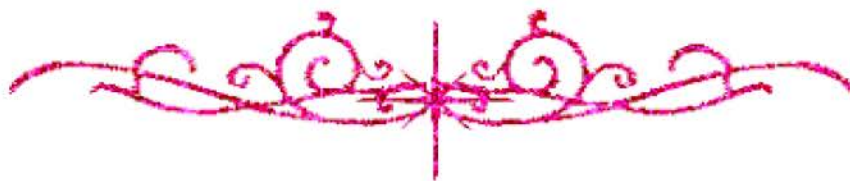


بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

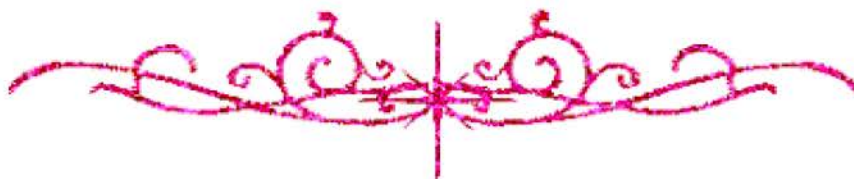
قسم

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



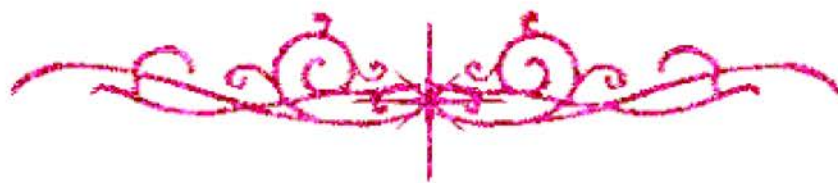
يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



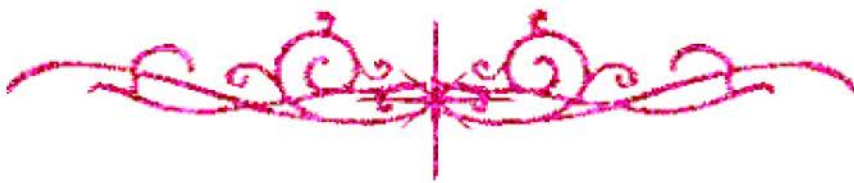


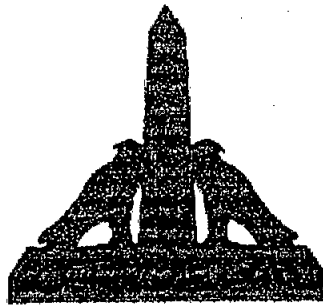
بالرسالة صفحات
لم ترد بالأصل





بعض الوثائق الأصلية تالفة





Ain Shams University
Faculty of Engineering
Computer and Systems Engineering Department

Efficient Techniques for Processing Image Databases

By

Tamer Mostafa Ebrahim Elshenawy

M.Sc. 1998

Computer and Systems Engineering Department
Faculty of Engineering, Ain Shams University



Ph. D. Thesis

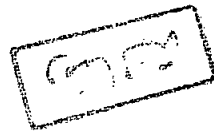
Submitted to Faculty of Engineering in Partial Fulfillment of
The Requirements for the degree of
Doctor of Philosophy in Electrical Engineering
(Computer and Systems)

Supervised by

**Prof. Dr. A-M A-Z Wahdan
Dr. Hazem Abbas**

Cairo 2002

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Statement

This dissertation is submitted to Ain Shams University for the degree of Ph. D. in Electrical Engineering (Computers and Systems Engineering).

The work included in this thesis was carried out by the author at the Computer and Systems Engineering Department, Ain Shams University. No part of this thesis has been submitted for a degree or a qualification at any other universities or institutions.

Date 25/8/2002
Name: Tamer Mostafa
Signature

Examiners Committee

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Title: Efficient Techniques for Processing Image Databases.

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Date: 25 / 8 /2002

ABSTRACT

In this work, we study the problem of Content Based Image Retrieval as an evolution of text-based and classification systems. Some of the recently developed systems in the field were reviewed and the weak points of these systems were highlighted. These systems were classified into color based and shape based solutions. The problem of database browsing and navigation was also addressed.

Two novel shape based systems are proposed. In the first system, a new shape-based search technique using the Radon transform is considered. During the indexing phase, a proposed compact feature vector is extracted from the image to be indexed after computing its radon transform; during the retrieval phase, the system uses the vector previously stored as a key for finding a short listed result set that will be introduced to the second phase of the search process.

In the Second system, a new fast search technique for images stored in databases using similarity retrieval depending on shape is presented. A short feature vector is extracted from the query image with small computational complexity. This vector is compared against all blocks of the same area in the target image, if the comparison yields an acceptable result, then a more detailed distance measure is calculated, the process continues until all areas are compared. The block having minimum distance is chosen as a representative of the distance measure between the query image and the target image.

In color based systems, two novel approaches are proposed. In the first system, we propose an image indexing algorithm based on color histogram bins and a new Image Retrieval Query Language (*IRQL*). Also,

a proposed image browsing and navigation algorithm is introduced that is based on the Discrete Cosine Transform.

In the second system, a new color based indexing scheme is presented. The approach proposed is based on using a hierarchy of color moments and offers a compromise between methods based on multiple color moments of segmented regions and those based on global color moments. The method retains positional information and leads to a multi-level comparison strategy where mismatches are quickly discarded at higher levels.

In Order to assess the efficiency of the new techniques, other approaches are implemented for obtaining comparative study.