بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

سامية محمد مصطفى
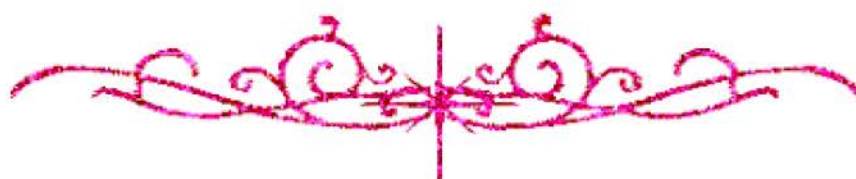
جامعة عين شمس

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

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصل

Tanta University
Faculty of Engineering

ASSESSMENT OF THE PLANIMETRIC ACCURACY

FOR SPOT SATELLITE IMAGERY

By

SOBHI ABDEL-MENAM ABDEL-GAWAD YOUNES

Demonstrator in Transportation Engineering Department,
Faculty of Engineering, Tanta University.
B.Sc. Civil Engineering Department, Tanta University.

A thesis
submitted in partial fulfillment
of the requirements for
the degree of

MASTER OF SCIENCE

In

CIVIL ENGINEERING "PUBLIC WORKS"

Under the Supervision of

Prof. DR. KAMAL ATALLA ATIA

Professor of Surveying and Geodesy
Faculty of Engineering
Alexandria University

DR. HAFEZ ABBAS AFIFY

Lecturer of Surveying and Geodesy
Faculty of Engineering
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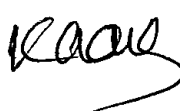Tanta University

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Supervisors

Thesis Title   **: Assessment of the Planimetric Accuracy for SPOT**

Satellite Imagery.

Researcher Name **: Sobhi Abdel-Menam Abdel-Gawad Younes.**

Date   **: 3 / 7 / 2003**

Supervisors**:**

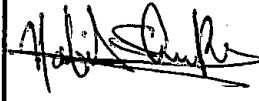| Name	Profession	Signature
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Dr. **Hafez Abbas Afify**	Lecturer of Surveying and Geodesy, Faculty of Engineering, Tanta University	*[signature]*

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THESIS TITLE : ASSESSMENT OF THE PLANIMETRIC ACCURACY
FOR SPOT SATELLITE IMAGERY.

RESEARCHER NAME : SOBHI ABD EL-MENAM ABD EL-GAWAD YOUNES

DATE : 3 / 7 / 2003

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﴿وقل ربي زدني علماً﴾
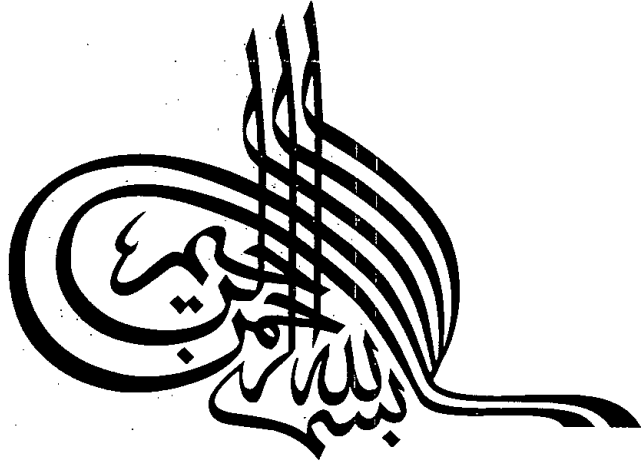
صدق الله العظيم

Abstract

ABSTRACT

Topographic maps are of fundamental importance for economic development and resource management in any country. So, it is necessary to increase the rate of mapping and map updates. At the moment, it seems that one way of doing this is to utilize the capabilities of remote sensing technology with its repeated coverage of the earth's surface.

The motivation for mapping from space images is given by the fact that past conventional mapping techniques have not been able to provide adequate mapping coverage at the required scale or even update existed topographic maps at a proper rate. Moreover, the new generation of high resolution remote sensing and the modern techniques in image processing gave a new trend of producing large-scale maps from space imagery.

Raw digital images contain geometric distortions that make them unsatisfactory for use as maps. These geometric distortions have been classified into systematic and non-systematic distortions. In order to make remote sensing data useful for resource and environmental managers, it must be geometrically corrected. The goal of geometric correction is to correct raw images from distortions in order to produce an image, with the geometric integrity of a map.

The purpose of this research is to determine the planimetric accuracy of SPOT images, obtained using the low-order polynomials as a transformation model. The purpose is extended to investigate the influence of the number, the distribution, and the accuracy of ground control points on the planimetric accuracy of SPOT images. Moreover, the effect of the measuring accuracy of image coordinates of control points on the obtained accuracy was also studied.

This study involved the implementation of SPOT satellite imagery in Egypt. Two subscenes cut out from two SPOT (panchromatic and multispectral) images acquired on August 11, 1995 with image processing level 1A were used. Each of the two subscenes covers the test site of Mahallet Roh town located to the vicinity

of Tanta, El-Gharbiia, Egypt. Different modules of (PCI) image processing software version 6.3 were used to perform various steps of this study.

In this study, the number of GCPs are increased from 4 to 25 points, adding one point at each new experiment. Two sources for collecting the ground coordinates of control and checkpoints are considered (map sheets of scales 1:25,000 and 1:2,500). Two SPOT images (panchromatic and multispectral) are employed to determine the image coordinates of control and checkpoints. Different distributions for each number of GCPs are considered, and five degrees of the polynomial transformation are tested.

The results proved the potential of using the polynomial transformation model for rectifying SPOT imagery. The obtained planimetric accuracy is suitable for producing topographic maps of scale (1:50,000). The relations between each factor of the ground control system (number – distribution – accuracy) and the planimetric accuracy of SPOT data were provided as well.

Acknowledgements

ACKNOWLEDGMENTS