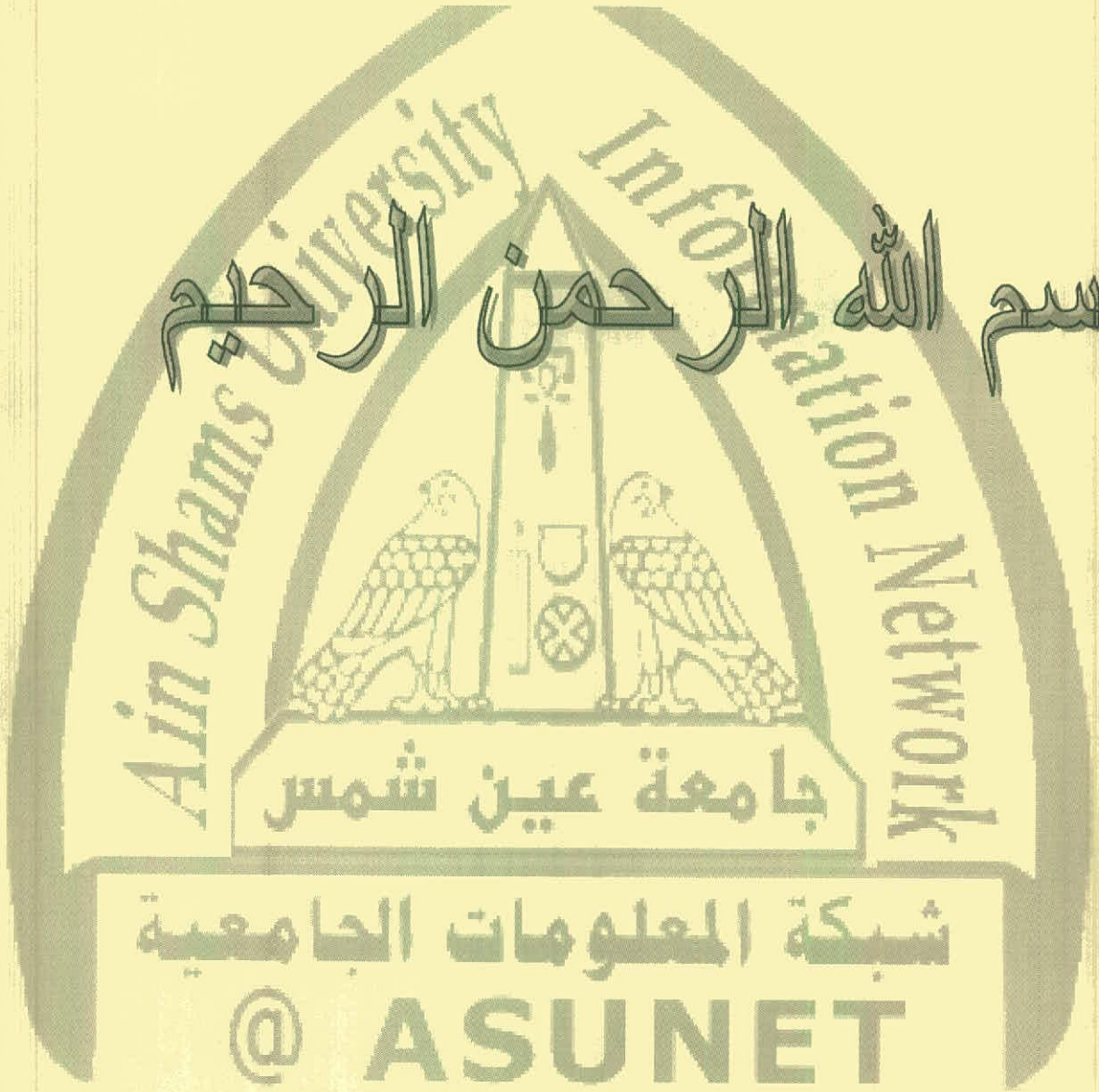
شبكة المعلومات الجامعية



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 الوثائـــــــق الاصليـــــة تالفـــة

بالرسالة صفحات لم ترد بالاصل

Zagazig University – Banha Branch
Shoubra Faculty of Engineering
Surveying Department

REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM IN SUDAN

A Thesis Submitted to
Shoubra Faculty of Engineering, Zagazig University – Banha Branch, Surveying Department , for the Fulfillment of the Requirements for the Degree of Doctorate of Philosophy in Survey Engineering

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2005

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APPROVAL SHEET

The undersigned certify that they have read the research work under the topic Remote Sensing and Geographical Information System in Sudan, Submitted by M.Sc. Engineer Fathi Mohamed Mohamed Saied to Surveying Department at Shoubra Faculty of Engineering, Zagazig University – Banha Branch, and they recommend to accept it for the fulfillment of the requirements for the degree of Doctorate of Philosophy in surveying and photogrammetry.

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Dedication

First Dedication

To those who taught me how to live with
Others in love, to my parents, my family,
With great love and thanks

Second Dedication

To the great figures whose help, I hope can assist me in gaining this degree of education, my teachers, my professors and to all those who supported me and stood by my side to help pave my way and point me in the direction of success throughout my educational life.

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ABSTRACT

This research presents the results obtained from an experimental test concerned with a modern, broad, and dynamic field of remote sensing (RS) and Geographical Information System (GIS) integration. It contains detailed studies for different techniques of (RS) and GIS and their applications especially for engineering purposes at Khartoum state in Sudan.

Through out the present research wide range of procedures and a new methodology were developed and applied. It can be concluded that:

1. Remote sensing and GIS integration was very useful issue in developing the GIS model of any study area required.

2. Different types of maps, including, base and thematic maps could be produced based on remotely sensed data as well as existing documents.

3. The findings showed acceptable results and some of the high-resolution remote sensing systems like IKONOS of the USA (one meter resolution) present the great importance of using them in many engineering, environmental, and military purposes.

4. Some important conclusion and recommendations are given at the end of the thesis to realize the practical applications in Sudan whenever it is possible, because of the very wide areas of the country and the main fruitful of this research, that, we found a solution for the sever problems arising from the lack of basic quantitative and qualitative statistical information, one of the main reasons of that lack is the scarce of topographic maps in Sudan. This solution opens a wide gate for space mapping and updating the old maps in my country. Therefore, because of its ability to allow the fast and cheap production and updating of maps covering large areas remote sensing (RS) and Geographical Information System (GIS) techniques are being the most suitable for establishing perfect system for basic quantitative and qualitative statistical information, mapping and updating maps in Sudan.

ABBREVIATIONS

AVNIR	Advanced Visible and Near Infrared Radiometer
CCD	Change Coupled Device Detectors
CSA	Canadian Space Agency
DEM	Digital Elevation Model
DTM	Digital Terrain Model
ERTS	Earth Resources Technology Satellites
ETM+	Enhanced Thematic Mapper Plus
FOV	Field of View
GCP	Ground Control Point
GIS	Geographic Information Systems
GPS	Global Positioning System
HRG	High Resolution Geometric
HRS	High resolution Stereoscopic
HRV	High Resolution Visible
HRVIR	High Resolution Visible Infrared
IFOV	Image Selection Guide Software
IKONOS	Derived from the Greek word for image
LISS	Linear Imaging Self-Scanner
LWIR	Long Wavelength Infrared
MDA	MacDonald Dettwiler
MS	Multispectral Imagery
NASA	National Aeronautics and Space Administration
NMAS	National Map Accuracy Standards
PAN	Panchromatic Imagery
PF	Priority Filter
RBV	Return Beam Vidicon
RGB	Red Green Blue
RMSE	Root Mean Square Error
SAR	Synthetic Aperture Radar
SIR	Synthetic Image Radar
SLAR	Side Looking Airborne Radar
SMC	Surface Material Composition
SWIR	Short Wavelength Infrared
TM	Thematic Capper
UTM	Universal Transverse Mercator
VMI	Vegetation Monitoring Instrument
VNIR	Visible and Near Infrared
WIFS	Wide Field Sensor.

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