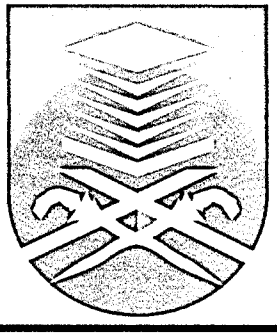
COMPARATIVE STUDY ON SATELLITE BASE AIR MONITORING SYSTEM

Project report is represent in partial of fulfillment for the award of the Bachelor of Electrical Engineering (Hons)
UNIVERSITI TEKNOLOGI MARA
MALAYSIA



NORSYUHAIMY B ABDUL SHUKOR
2006135163
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA (UiTM)
40450 SHAH ALAM
SELANGOR DARUL EHSAN

MEI 2010

ACKNOWLEDGEMENT

Firstly I would like to express my gratefulness to ALLAH S.W.T for I have finally finished my final year project report of Comparative Study On Satellite Base Air Monitoring System. I would like to express my sincere gratitude and appreciation to my project supervisor, Pn Norhayati bt Hamzah for her continued support, generous guidance, help, patience and encouragement in during for the preparation of this final project until its complete. I also would like to take this opportunity to appreciate the important contributions of the following persons;

1. My family for continuously praying of my success
2. Mr. Mohamad Zarifi bin Mohd Rodzi, Research assistance for Dr Azilah binti Saparon, for his help and idea
3. Asma' bt Ahmad Bahari, Norashikin bt Hassan, Ismahalili bin Ishak, and all my friends and everybody who have either been directly or indirectly involved in completing this final project report

Once again, thank you all for helping me finish this final project report and only ALLAH S.W.T can reciprocate their helps.

ABSTRACT

The air quality indicator approximated by satellite measurements is known as atmospheric particulate loading, which is evaluated in terms of columnar optical thickness of aerosol scattering. The effect brought by particulate pollution has gained interest after recent evidence on health effects of small particles. This study uses an empirical model, based on actual air quality of particulate matters of size less than 10 micron (PM10) measurements from to predict PM10 based on optical properties of satellite digital imagery. The digital image was separated into three bands assigned as red, green and blue for multispectral algorithm regression. The digital numbers were extracted corresponding to the ground-truth locations for each band and then converted to radiance and reflectance values. The digital numbers of the three bands were converted into irradiance and then reflectance. The atmospheric reflectance value was extracted from the satellite observation reflectance values subtracted by the amount given by the surface reflectance. The atmospheric reflectance values were later used for PM10 mapping using the calibrated algorithm. The PM10 map was color-coded and geometrically corrected for visual interpretation. This study indicates that PM10 mapping can be carried out using remote sensing technique.

KEYWORDS: Air Quality, PM10

TABLE OF CONTENTS