

**ANALYZING THE EFFECTIVENESS OF ANTI-RADIATION
SHIELD IN REDUCING THE EFFECTS OF MOBILE PHONE
EMISSIONS**

**This thesis is presented as a partial fulfillment for the award of the
Bachelor of Electrical Engineering (Hons.)
UNIVERSITI TEKNOLOGI MARA (UiTM)**



**AZIZAH BT A.RAHMAN
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM,
SELANGOR, MALAYSIA**

NOVEMBER 2009

ACKNOWLEDGEMENT

First and foremost, I would like to state my greatest gratitude to ALLAH S.W.T that gives me an opportunity to be able to complete my final year project and thesis.

I would like to express my deeply sense of gratitude and appreciation to my project supervisor, Pn. Husna Bt Abdul Rahman for the consistent help and guidance as well as prevision of his valuable time, encourage and patient in completing this project.

The appreciation also goes to Assoc. Prof Zunairah Hj. Murat for providing necessary information and laboratory equipments.

Thanks to En. Adib and Cik. Hafizah for their willingness to evaluate my project presentation.

Last but not least, thanks to my family, friends and anybody who involved directly or in directly for their support, understanding, help and advice.

Thank you.

ABSTRACT

This project investigates the effectiveness of anti-radiation shield in reducing mobile phone emissions using resonant field imaging system (RFI) and artificial neural network (ANN). The RFI frequency counter was used to capture the human frequency of 30 students including male and female students before and after using mobile phone with and without the anti-radiation shield. ANN was then used to further classify between samples using the mobile phone; with and without the anti-radiation shield. Based on the results presented, it can be concluded that the anti-radiation shield electromagnetic wave is effective in filtering off the harmful electromagnetic waves emitted from the ear piece of mobile phone. It is also observed that classification of samples with and without the anti-radiation shield is possible using the characteristics of human bioenergy.

TABLE OF CONTENTS

CHAPTER	DESCRIPTION	PAGE
	TITLE	i
	SUPERVISOR APPROVAL	ii
	DECLARATION	iii
	DEDICATION	iv
	ACKNOWLEDGEMENT	v
	ABSTRACT	vi
	TABLE OF CONTENTS	vii
	LIST OF FIGURE	viii
	LIST OF TABLE	ix
	LIST OF ABBREVIATIONS	x
1	INTRODUCTION	
	1.1 Background of Study	1
	1.2 Objectives	2
	1.3 Scope of Work	3
	1.4 Organization of Thesis	4
2	LITERATURE REVIEW	
	2.1 Resonant Field Imaging (RFI)	4
	2.2 Human Body Radiation	5-6
	2.3 Mobile Phone Radiation	6
	2.3.1 Radiofrequency radiation associated with mobile phone	6-7
	2.3.2 Specific Absorption Rate (SAR) for the mobile phone radiation	7
	2.4 Anti-radiation Shield Electromagnetic Wave	7
3	METHODOLOGY	
	3.1 Neural Networks	8-9
	3.1.2 Perceptrons	10-11
	3.2 Use of Anti-radiation Shield Electromagnetic Wave	11
	3.3 Data Collection	12
	3.3.1 Questionnaire	12
	3.3.2 RFI Data Acquisition	12-13
	3.4 Data Analysis	14
4	RESULT AND DISCUSSION	
	4.1 Questionnaire	15 - 17
	4.2 Data Collection	18
	4.2.1 Measurement of frequency	18 - 27

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

In mobile communication systems, the quality of the RF link between a base station and mobile phone strongly depends on the amount of power that is transmitted and received by the mobile phone and antenna design [1]. Nowadays, most users are aware of the potential health-hazard and effect of using the mobile phone.

Mobile phones are growing ever more popular. The increase in mobile phones has triggered worries about their safety. They have been blamed for a wide range of health problems, from cancer to headaches.

Mobile phones are a cross between a radio and telephone. They were invented in the early 1980s. The handset of a mobile phone is a kind of radio transmitter and receiver. Mobile phones are linked to the national telephone exchange by base stations. When a mobile phone is switched on it releases signal around every 20 seconds saying "I'm here" to the nearest base station, so the location of the phone is known and it can receive and make calls. With mobile phones, the sound is sent and received as a "microwave" [2].

People have voiced their concern regarding the radio waves which are used to transmit and receive mobile phone calls. Radio waves can pass through the body and when we do, some of the energy can be absorbed. This movement of energy is known as radiation. All electrical goods give off a certain amount of radiation but this is seen as harmless.

Some radiation is harmful to the body, for example, the radiation given off by a nuclear explosion or even from direct sunlight. Harmful radiation such as X-rays and gamma-rays can affect body tissues to such an extent that they change cells and DNA. These changes can lead to cancer and genetic defects. Mobile phones do expose us to radiation but at a very low level. The radiation is not like X-rays or gamma-rays. The