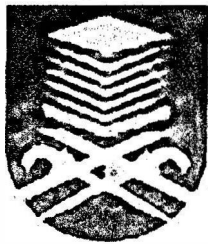


**ANALYSIS OF MOBILE PHONE HAZARDOUS EFFECT USING
MAMDANI FUZZY INFERENCE SYSTEM**

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



**SITI NOOR AIMI BINTI GHAZALI
Faculty of Electrical Engineering
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM
SELANGOR DARUL EHSAN
NOVEMBER 2009**

ACKNOWLEDGEMENT

In the name of Allah, The Most Gracious, The Most Merciful. Praised be to Prophet Muhammad S.A.W, his companions and those who are on the path as what he preached upon.

First of all, all of my thanks goes to the Almighty Allah for giving me the will and patience in completing this project.

Next, I would like to express my appreciation to all of the people that have help me a lot and taught me on how to overcome the problems I have in order to complete my project. My greatest appreciation goes to my Project Supervisor, Puan Husna Abdul Rahman for guiding me and assisting me all of these two semesters to complete my project. Besides that, my appreciation also goes to Assoc. Prof Zunairah Hj. Murat and the staffs in the Biomedical laboratory for giving me the information and lending me the laboratory equipment

Last but not least, I would like to thank my family for their love and constant support on me throughout my studies at UiTM. My appreciation also goes to my friends and classmates that helped me a lot in their own way.

ABSTRACT

This technical paper presents the analysis of the hazardous effects caused by mobile phone radiation. Mamdani Fuzzy Inference System was used to develop the system for producing health condition of a mobile phone user by using two inputs: change in health index and the body temperature of the mobile phone user. The latter is directly caused by the RF radiated by the mobile phone [1],[2]. This system is also useful for prediction purposes. The analysis was done on 30 samples of students from several faculties in University Teknologi MARA Malaysia. The equipment used to measure the frequency of the mobile phone and also the frequency of the sample's body is the RFI frequency counter and the mobile phone used for this project is Nokia 1100. RFI software was used to convert the frequencies into colors that further produce health interpretations. Health condition is best when there is a high positive change in the health index and low body temperature, whereas is worse when there is a high negative change in the health index and high body temperature. Overall, the system indicates that a majority of the samples' health condition deteriorate after using the mobile phone.

TABLE OF CONTENTS

CHAPTER	DESCRIPTION	PAGE
	TITLE	1
	SUPERVISOR'S APPROVAL	ii
	DEDICATION	iii
	ACKNOWLEDGEMENT	iv
	ABSTRACT	1
	TABLE OF CONTENTS	2-3
	LIST OF FIGURES	4-5
	LIST OF TABLES	6-7
	LIST OF EQUATION	8
	LIST OF ABBREVIATIONS	9
1	INTRODUCTION	
	1.0 Background of Study	10
	1.1 Objectives	11
	1.2 Scope of Work	11
	1.3 Organization of Thesis	12
2	LITERATURE REVIEWS	
	2.1 Resonant Field Imaging (RFI)	13-14
	2.2 Mobile Phone Radiation	15
	2.3 Human Health Index	15-16
	2.4 Temperature	16

CHAPTER 1

INTRODUCTION

1.0 BACKGROUND OF STUDY

Nowadays, almost everyone have a mobile phone and it is being used widely in the world. Mobile phone makes communication between two persons in different places becomes easier. Mobile phone uses the air as its medium of transmission and it is known that each device that uses microwave signal transmits radiation to its surrounding. The same thing applied to mobile phone. It also transmits radiation to the user and its surroundings.

This is one of the things that contribute fear to everyone that aware about the effect caused by the mobile phone radiation. For many years since mobile phone becomes one of the must have device for everyone, many research have been done in order to analyze the effect and harm that a mobile phone could cause to its user.

One of the health effect caused by the radio frequency radiation exposure is increasing body temperature [1]. Several researches have been done to measure the temperature rise of human body caused by the mobile phone and the temperature rise could lead to biological effect as the heat damages the cells and tissues in our body [2].

Many of the previous research done on effect of the mobile phone radiation are only on the short term effect and there are no long term effect research has been done as it is almost impossible to get a human sample that are willing to be a sample of a research for a long time.

There are many ways to analyze the effect of mobile phone radiation to human such as by using the simulation of human head to analyze the amount of electromagnetic radiation absorb by the head and also by using the specific absorption rate of the mobile phone [3].