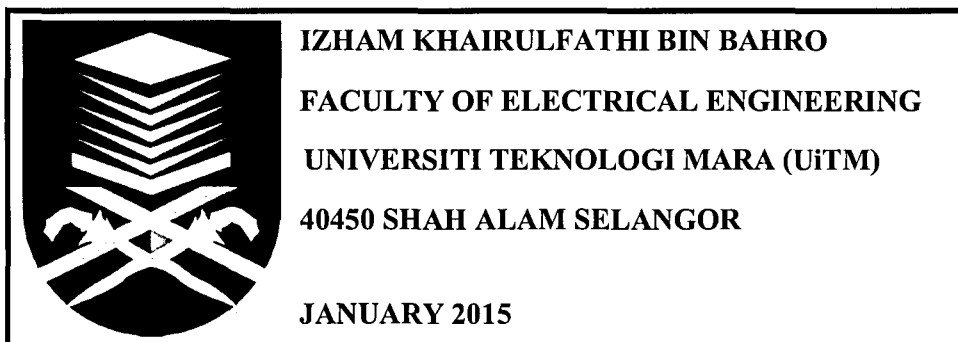


**PERFORMANCE OF LEAST SQUARE BASED CHANNEL ESTIMATION FOR
HIGH ORDER MODULATION QAM-OFDM-MIMO IN THE PRESENCE OF
MULTIPATH FADING CHANNEL**

**This is presented in partial fulfillment for the award of the
Bachelor of Engineering (Hons.) Electronic (Communication)**

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ABSTRACT

As the communication system evolving and enhancing, the need for high speed and reliable communication system is crucial. With the combination of multiple-input multiple-output (MIMO) communication system along orthogonal frequency division multiplexing (OFDM), a reliable high rate communication system can be achieved. The MIMO OFDM system with 2X2, 3x3, and 4x4 antenna configurations will use 256, 512 and 1024 QAM modulation level in the presence of multipath Rayleigh and Additive White Gaussian Noise (AWGN) channel. The performance evaluation of the system is determined in term of Bit Error Rate (BER) and Signal Energy to Noise Power Ratio (Eb/No). The MIMO OFDM system with Least Square channel estimation will be designed and simulated using MATLAB where the results will then be analyzed. From the results obtained, it can be said that as the QAM level increased the BER will increase too. Besides that, the performance of the system will improves as the number of transmit and receive antennas increase. It is known that the system performance of 4x4 antennas using 1024 QAM is the same with the system of 2x2 antennas using 256 QAM. However, the data rate increase is 40% for 1024 QAM. In addition, the great performance showed by the MIMO-OFDM system is greatly enhanced by the estimation technique used which is Least Square channel estimation. Least Square channel estimation accurately recovered the distorted signal through multipath fading channel thus improve the performance of the MIMO-OFDM system

TABLE OF CONTENTS

DECLARATION	i
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
TABLE OF CONTENTS	v
LIST OF FIGURES	viii
LIST OF TABLES	x
LIST OF SYMBOLS AND ABBREVIATIONS	xi
CHAPTER 1	
INTRODUCTION	1
1.0 Background of study	1
1.1 Objectives	3
1.2 Problem Statement	3
1.3 Scope of Study	4
1.4 Thesis Organization	4
CHAPTER 2	
LITERATURE REVIEW	6
2.0 Introduction	6
2.1 Wireless Evolution	6
2.1.0 1G	7
2.1.1 2G	9
2.1.2 3G	9
2.1.3 4G	9

2.2 AWGN Channel	10
2.3 Multipath Fading channel	10
2.3.1 Factors Cause Fading	12
2.4 Bit Error Rate	12
2.5 MIMO	13
2.5.1 Advantages of MIMO	16
2.6 OFDM	17
2.5.1 Orthogonality	19
2.5.2 Advantages	20
2.5.3 Disadvantages	20
2.7 Channel Estimation	22
2.6.1 Pilot Structure	22
2.6.2 Least Square Channel Estimation	25
2.8 Quadrature Amplitude Modulation	26
CHAPTER 3	
METHODOLOGY	30
3.0 Introduction	30
3.1 System Model	30
3.2 Research Simulation	32
3.2.1 Flowchart	33
3.2.2 Matlab Component	35
CHAPTER 4	
RESULT AND DISCUSSION	37
4.0 Introduction	37
4.1 BER vs Eb/No Graph for MIMO-OFDM System With 2x2, 3x3 and 4x4 Antennas	38
4.2 BER VS Eb/No Graph for MIMO-OFDM System With 256, 512 and 1024 QAM	41
4.3 BER VS Eb/No Graph for MIMO-OFDM System With 2X2, 3X3 and	44