# SIMULATION OF PIEZOELECTRIC IN MEMS GYROSCOPE

Thesis is submitted and presented in fulfillment of requirement for the

Bachelor of Engineering (Hons) in Electronic

Universiti Teknologi MARA



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#### ACKNOWLEDGMENT

In the name of Allah, The Most Generous and The Most Merciful. With the deepest sense of gratitude to Allah the Almighty for giving me strength and ability to complete my final year project and thesis.

My deepest gratitude is expressed to my supervisor, Madam Wan Rosmaria Binti Wan Ahmad for all the guidance, support and advice provided to me throughout the final year project.

Last but not least, I am also would like to express my appreciation to my beloved family, friends and anybody who are involved directly or indirectly for their support and devices during completing my final year project.

Thank you.

### ABSTRACT

In this paper, piezoelectric gyroscope based on Micro electro and mechanical system (MEMS) was presented using Ansys software. The design of piezoelectric gyroscope is based on parameter and structure which have selected from previous research and journal. The structure and the design of piezoelectric gyroscope have different output such as frequency, charge or voltage output. It focused on quantitative indicator based on different length, width, depth and voltage apply on piezoelectric plate from the vibration and use Taguchi method to get the optimum performance from the best combination experiment. The result of this experiment shows the combination of 5x4x5mm with voltage applied 5v will give the optimum performance for the displacement ratio between y-axis, x-axis and z-axis which 0.3618 and 0.1180 for A and B respectively.

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## **CHAPTER 1**

#### INTRODUCTION

#### **1.0 INTRODUCTION**

In this chapter, it will introduce about MEMS, gyroscope and piezoelectric. All of this three kind have their own characteristic which will apply in one device which known as piezoelectric in MEMS gyroscope.

#### 1.1 BACKGROUND OF STUDY

As use in MEMS, it makes the material use is in micro size. The process of piezoelectric MEMS is micro scale fabrication use to know as microfabrication. Elements in MEMS consist miniaturized structures, sensors, actuators and microelectronic [1].

MEMS gyroscopes have their application. Draper turning fork, laser ring, and piezoelectric plate is MEMS gyroscope application. The main focus gives in this project is piezoelectric gyroscope. Gyroscope is a device used to measure angular velocity. Usually it is used for the sailor as sea navigation in foggy condition. MEMS gyroscope