"I hereby declare that I have read through this report entitled "Disaster Remote Messaging System" and found that it has comply the partial fulfilment for awarding the degree of Bachelor of Mechatronic Engineering".

Signature : ........................................
Supervisor's Name : DR. Ahmad Zaki Bin HJ Shukor
Date : ...........23/1/16......................
DISASTER REMOTE MESSAGING SYSTEM

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A report submitted in partial fulfilment of the requirements for the degree of Bachelor in Mechatronic Engineering

Faculty of Electrical Engineering
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2016
I declare that this report entitled "Disaster Remote Messaging System" is the result of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature: [Signature]
Name: Gopalasamy a/l Kasiappan
Date: 23/6/2016
To my beloved mother and father
ACKNOWLEDGEMENT

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ABSTRACT

Since history started, natural disasters have threatened mankind existence. Natural disasters happen mainly due to the geographic position and climate change. Timely disaster warning and evacuation or safety measurement could save lives of people. Malaysia is a country which citizen are rarely prepared to safety measure of the natural disaster especially earthquake since most of us thought earthquake in Malaysia is impossible. Earthquake is type of natural disaster which cannot be predicted exact time before it happen. The country lacks of effective disaster preparedness system to comfort natural disaster. For this reason as mention, I have proposed a system that could detect the earthquake and send safety measurement message that the receiver can display the message. The embedded system used to develop this disaster remote messaging system are Raspberry Pi. This project explains how to send message and receive message using Raspberry Pi. The objective of the project is to detect medium range natural disaster using sensor, to develop a disaster messaging system using smartphone’s application and to calculate the efficiency rate of the message delivered. The system using smartphone application WhatsApp from the library of Yowsup for sending. Vibration sensor is used to detect the vibration (earthquake) then send the signal to Raspberry Pi. Input signal from the sensor trigger Raspberry Pi to send precaution message which is pre-code to be display. The message will be send to recipient mobile phone which has installed with Whatsapp smart phone application. This will alert him or her on the earthquake and quickly takes precaution measurement to save his/her life.

Since time is a factor when disaster happens, the experiment on time needed for the system to detect earthquake, send, receive and display the message are conduct. The experiment results will demonstrates the effectiveness of our system. Hence, with the introduction of this product, many innocent lives could be saved as well.
ABSTRAK


Masa adalah faktor utama apabila bencana berlaku, eksperimen pada masa yang diperlukan untuk sistem untuk mengesan gempa bumi, menghantar, menerima dan memaparkan mesej dijalankan. Keputusan eksperimen menunjukkan keberkesan sistem kami. Oleh itu, dengan pengenalan produk ini, banyak nyawa yang tidak berdosa dapat diselamatkan juga.
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<tr>
<td>PWM</td>
<td>Pulse width modulation</td>
</tr>
<tr>
<td>km</td>
<td>Kilometer</td>
</tr>
<tr>
<td>m</td>
<td>Meter</td>
</tr>
<tr>
<td>cm</td>
<td>Centimeter</td>
</tr>
<tr>
<td>mm</td>
<td>Millimeter</td>
</tr>
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<td>Length</td>
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<tr>
<td>H</td>
<td>Height</td>
</tr>
<tr>
<td>V</td>
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<tr>
<td>g</td>
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CHAPTER 1

INTRODUCTION

In this chapter, motivation, problem statement, objective, scope and project outline will be presented and discussed. At here, description of where the project start from, the limitation the target of the project will be described throughout. Besides, some statistic of the true fact of the related to the project will be disclose.

1.1 Motivation

On 5 June 2015, Malaysian has faced an unforgettable moment which is a strong magnitude of earthquake with moment measure 6.0 Richter scale hits Ranau, Sabah, East Malaysia at 7.15am [2]. It was strongest earthquake in Malaysia since 1976 which measured 5.8 Richter scale struck Lahad Datu. On the same day evening, three aftershock earthquakes happened measuring 4.3 Richter scale for first two and 2.8 Richter scale for third [3]. Even though the earthquake hits Malaysia was a medium range natural disaster, but it has 18 casualties and cause many injuries to people and causes many property damage [4] [5] [6]. Malaysia still outdated in earthquake disaster management since the last earthquake happened in 1976 and many people thought Malaysian have myth that Malaysia is a place where earthquake is impossible. Thus, Malaysian has no precaution on earthquake or don’t know what to do if earthquake strike. Public get panic and over earthquake and causes the situation goes chaos. This also may causes loses of life as some people may fall down and others are step on them during chaos. People inside buildings may die or seriously injured due to heavy concrete fall on them. Not only in Malaysia, in many developing countries like recently in Nepal, there are totally more than 8000 died [7]. In the last 25 years, just in five dead list earthquake have
combined to cause deaths of 680,000 people in Haiti, China, Pakistan, Iran and India Ocean [4].

From the Table 1.1 and Table 1.2 below, it can be conclude that buildings collapse causes more people to die. 37 people died due to fence and fallen object on them. Correct method to handle or manage earthquake are still not available in Malaysia, therefore we need to explore more about earthquake management so that in future, with proper handling, the total death toll will reduce or nil if the earthquake strike.
Table 1.1: Earthquake in Japan with Damage to Residential [1]

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<th>Earthquake</th>
<th>Year</th>
<th>Month/day</th>
<th>Hour: min</th>
<th>Magnitude (JMA)</th>
<th>Totally Collapse</th>
<th>Burnt</th>
<th>Heavily Damaged</th>
<th>Lightly Damaged</th>
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<td>Niigata</td>
<td>1964</td>
<td>6/16</td>
<td>13:01</td>
<td>7.5</td>
<td>1960</td>
<td>290</td>
<td>6640</td>
<td>67825</td>
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<td>Tokachi-Oki</td>
<td>1968</td>
<td>5/16</td>
<td>9:49</td>
<td>7.9</td>
<td>673</td>
<td>18</td>
<td>3004</td>
<td>15697</td>
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<tr>
<td>Izu-Hanto-Oki</td>
<td>1974</td>
<td>5/9</td>
<td>8:33</td>
<td>6.9</td>
<td>134</td>
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