

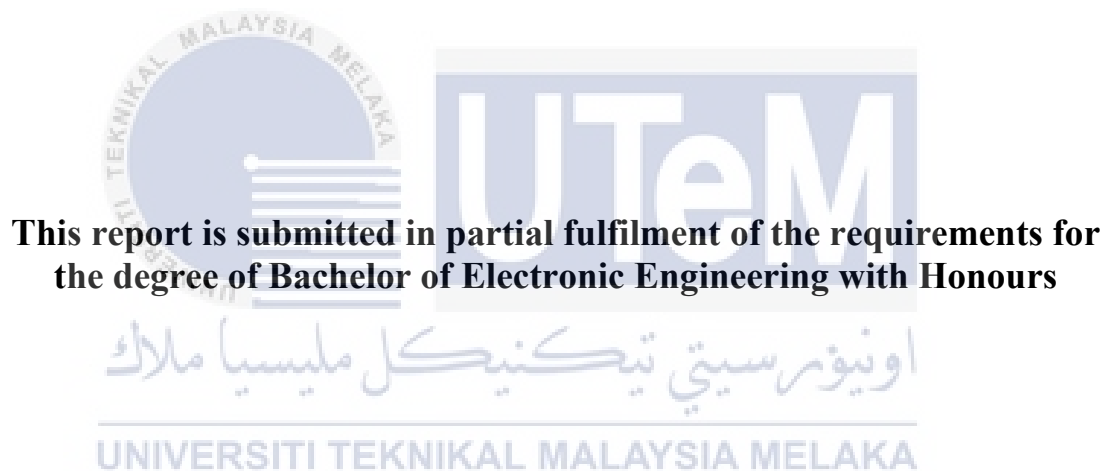
HEALTH AND SAFETY MONITORING FOR LIVE-ALONE ELDERLY PEOPLE



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**HEALTH AND SAFETY MONITORING FOR LIVE-ALONE
ELDERLY PEOPLE**

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**This report is submitted in partial fulfilment of the requirements for
the degree of Bachelor of Electronic Engineering with Honours**

**Faculty of Electronic and Computer Engineering
Universiti Teknikal Malaysia Melaka**

2023

BORANG PENGESAHAN STATUS LAPORAN
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Sesi Pengajian : 2022/2023

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DECLARATION

I declare that this report entitled “HEALTH AND SAFETY MONITORING FOR LIVE-ALONE ELDERLY PEOPLE ” is the result of my own work except for quotes as cited in the references.



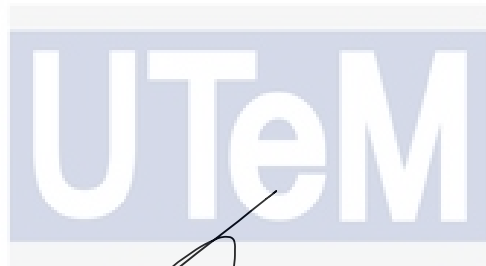
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Date : 11 | 1 | 2023

DEDICATION

First and foremost, I am very grateful to all of the family members for their valuable guidance and support on completion of this project in its entirety. I would like to express my deepest appreciation to all those who provided the possibility to this project. A special gratitude is given to my supervisor, Dr Khoo Chin Foon whose contributes in stimulating suggestions and encouragement that helped a lot in this project. Besides, not to forget the lecturer who's involved in both PSM1 and PSM2 which provide reminders for me about the important things that must be done before the due date and always give moral support to complete the project. Next, I also appreciate the guidance given by panels that has improved my project and my knowledge. Finally, gratitude goes to all my friends who directly or indirectly helped me to complete this project.

ABSTRACT

In Malaysia, some parents are living alone. Usually, these group of people may have health and forgetfulness problems. Thus, safe care and assistance should be taken into account to keep their lives healthy and safe. Their level of health and safety is neglected when children live away from them on the work factor. Furthermore, in some cases the needs of people living alone are not met and are not identified until an emergency occurs. Therefore, to reduce such problems, health and safety monitoring for the elderly living alone was created. First, their blood pressure can be recorded by a microcontroller. The data will then be sent to the IoT service, which can be viewed via a smartphone. Additionally, GPS trackers can be used to inform other family members about the whereabouts of their parents. If their parents often go out alone, they can contact someone to let them know of their concerns if they forget or get lost. With the creation of this project, children who are away from their parents can monitor directly via mobile phones only.

ABSTRAK

Di Malaysia, ada ibu bapa yang tinggal bersendirian. Biasanya, kumpulan orang ini mungkin mempunyai masalah kesihatan dan pelupa. Oleh itu, penjagaan dan bantuan yang selamat harus diambil kira untuk memastikan kehidupan mereka sihat dan selamat. Tahap kesihatan dan keselamatan mereka diabaikan apabila kanak-kanak tinggal jauh daripada mereka atas faktor kerja. Tambahan pula, dalam beberapa kes keperluan orang yang tinggal bersendirian tidak dipenuhi dan tidak dikenal pasti sehingga kecemasan berlaku. Justeru, bagi mengurangkan masalah tersebut, pemantauan kesihatan dan keselamatan warga emas yang tinggal bersendirian diwujudkan. Pertama, tekanan darah mereka boleh direkodkan oleh mikropengawal. Data kemudiannya akan dihantar ke perkhidmatan IoT, yang boleh dilihat melalui telefon pintar. Selain itu, penjejak GPS boleh digunakan untuk memaklumkan ahli keluarga lain tentang keberadaan ibu bapa mereka. Jika ibu bapa mereka sering keluar bersendirian, mereka boleh menghubungi seseorang untuk memberitahu mereka tentang kebimbangan mereka jika mereka terlupa atau tersesat. Dengan terciptanya projek ini, anak-anak yang berjauhan dengan ibu bapa mereka boleh memantau terus melalui telefon bimbit sahaja.

ACKNOWLEDGEMENTS

This appreciation is given to my parents for having provided support and encouragement both mentally and physically. Not to be forgotten is my supervisor, Dr. Khoo Chin Foon, the highest appreciation is given to her for giving a lot of guidance and non-stop support until this project is fully completed. A special gratitude gives to her whose contribution in stimulating suggestions and encouragement and help a lot in this project. She also, gives a lot of knowledge to further facilitate my understanding of the selected assignment titles. Also, a big thanks to panels of this project, Prof. Madya Dr. Maisarah Bt Abu, Dr Mawarni Bt Mohamed Yunus and Dr Noor Shahida Bt Mohd Kasim for giving their support, guidance, and comments of my project. To end with, I would like to express my infinite gratitude to anyone who has been involved in producing this project directly or indirectly. Your cooperation is appreciated.

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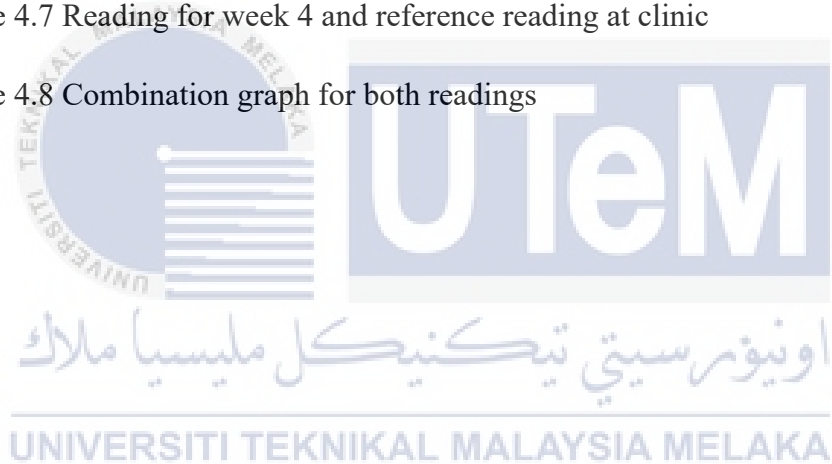


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LIST OF SYMBOLS AND ABBREVIATIONS

GPS	:	Global Positioning Systems
IDE	:	Integrated Development Environment
IoT	:	Internet of Things
GSM	:	Global System for Mobile
SMS	:	Short Message Service
BP	:	Blood Pressure
HR	:	Heart Rate
BPM	:	Beat per Minute
mmHg	:	Millimeters of mercury
Sys	:	Systolic
Li-ion	:	Lithium Ion
NiMH	:	Nickel-metal hydride
Nicad	:	Nickel Cadmium

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CHAPTER 1

INTRODUCTION



This chapter briefly outlines the project's introduction and problem statements, as well as why the project is being offered. Aside from that, this chapter clarifies the project's objectives and scopes, as well as the expected outcome.

1.1 Project Background

Due to the increasing aging population of people, most of the old people choose to stay alone instead of staying with their children. This is because these old people want to be comfortable and safe within their own house. There are many pros and cons while staying alone at their house. The health and safety of these elderly should be considered while they are staying alone. To overcome these challenges, Health and Safety Monitoring for Live-Alone Elderly People can be used to protect and track them when they are inside or out of their house. This project will remotely

access old people's location information and the latest blood pressure sensor will read the elderly's blood pressure to observe any variation of their blood pressure throughout the day. The microcontroller can record their blood pressure and remind them to use it every six hours. Then, the microcontroller will send the data to the Iot service which can be accessed using Smartphone. So that they can get healthcare more quickly before anything happens in urgent cases. Other than that, GPS tracker can be used to inform other family members about their parent's whereabouts. In case their parents are always going out alone, when they forget or get lost, they can contact someone to inform them regarding their problems.

1.2 Problem Statement

Neglect by the relatives of elderly people who live alone and do not receive good quality of social, healthcare and psychiatric assistance is an important public problem [1].

The healthiness of the elderly people probably will be neglected especially when their already adult children are needed to work every day. With their old age, staying alone may prove difficult especially when they fall sick. Therefore, by letting their children know about their blood pressure level, the children can get some foresight regarding when their parents will fall sick. On the other hand, they can always get the latest location information about their parents, especially when they go out from home.

Thus, in this project health monitoring and location tracking systems will be established in order to solve the stated problems above. This project will provide health monitoring system by specifically monitor the blood pressure level of elderly.

In the same time, this project also will act as a location tracker especially when they are away from home.

1.3 Objectives

1. To design a Location Tracking System that will provide real time location information including latitude, longitude and location on the maps.
2. To design the Blood Pressure Monitoring System that will monitor the elderly who live alone at their homes.
3. To analyses the accuracy of GPS location and Blood Pressure level measurement.

1.4 Project Scope

This project will use Fritzing in drawing and simulation. The software for ESP32 that will be used is Arduino Software (IDE) which uses C++ language. Next, components those are included in this project are Neo6m GPS Module, Blood pressure monitoring tool, jumper wire and ESP32 as the controller. Other than that, data analysis will be conducted to analyses the frequent GPS that will update the data to the latest location and what level is good and bad for blood pressure. This project will be targeted at family who has elderly as their parents. Finally, the accuracy of blood pressure readings and GPS readings will be compared with the clinic blood pressure reading and Google Maps.

1.5 Overview of Chapters

Health and Safety Monitoring for Alone Elderly is actually used to facilitate the monitoring of people living alone in their homes. This project will produce a Location Tracking System and a Blood Pressure Monitoring System. This report has 5 chapters to describe the development of this project which is Introduction, Background Study, Methodology, Results and Discussions and lastly Conclusion and Recommendation.

Chapter 1: This chapter is the beginning of introduction where it will describe about this project that includes introduction of the project, objectives, problem statement, scope, sustainability and summary of the project.

Chapter 2: This chapter will give a background research or literature review that could be used as a reference for improvement for the project.

Chapter 3: The methodology that will be applied to conduct this project is explained that includes technical design of electronic component and coding that use in this project.

Chapter 4: This chapter will present all of the results and discussion on outcomes of the project. It will also include sustainability and environment aspects for this project.

Chapter 5: This chapter will summarize everything as conclusion and suggestion on how to improve and make this project better in future.

CHAPTER 2

BACKGROUND STUDY



This chapter will discuss multiple references on the required components whether same or different from previous study have been collected to accomplish the objective. Aside from that, this chapter will provide the result and how the observation methodology that have been used by previous researchers