

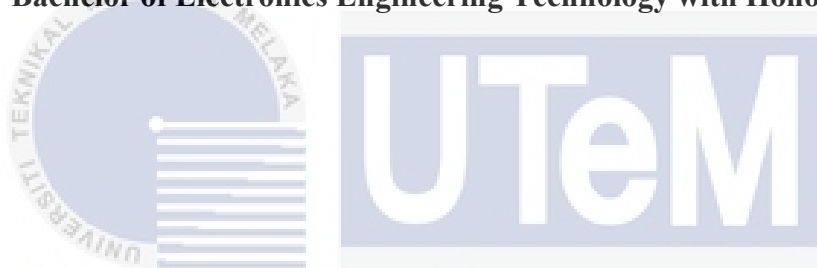
Bachelor of Electronics Engineering Technology with Honors

2021

SMART CHILD TRACKER USING IOT

MUHAMMAD SYAFIQ BIN JAMALUDIN

**A project report submitted
in partial fulfillment of the requirements for the degree of
Bachelor of Electronics Engineering Technology with Honors**



Faculty of Electrical and Electronic Engineering Technology

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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DECLARATION

I declare that this project report entitled “SMART CHILD TRACKER USING IOT“ is the result of my own research except as cited in the references. The project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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I hereby declare that I have checked this project report and in my opinion, this project report is adequate in terms of scope and quality for the award of the degree of Bachelor of Electronics Engineering Technology with Honours.


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DEDICATION

To my beloved mother, Zalina Binti Samsudin, my dearest father, Jamaludin Binti Ahmad Razali, my supportive supervisor Madam Izadora Binti Mustaffa, my brother Muhammad Naqib Bin Jamaludin and also my friends Aiman Hakeem Bin Shoksi and Saiful Sophian Bin Latif.



ABSTRACT

In 2021 a total 4,471 cases of missing children were reported. In an effort to counter this problem the Malaysian government created a Missing Children Portal. A preventive method would complement the government's effort. This thesis described a device that actively tracks the whereabouts of the wearer, i.e. child. The device consists of microcontroller, GPS and GSM Module, Heartbeat Sensor and DHT11 sensor. Children who wear an activity tracker bracelet with IoT and GSM technology are monitored 24 hours a day. As a result, the prototype proposes a way to address the IoT-related dispute among children. This idea proposes a wearable "Activity Tracker Wristband" that is preloaded with all the necessary data, including human responses such as rage, anxiety, uneasiness, and terror. When the victim is confronted with these scenarios, the various sensors generate an emergency signal, which is sent to the smartphone. The technology successfully monitors the presence of the children in the predicted zone. When a person enters the monitoring zone, GSM sends a help request to the parents and individuals in the immediate vicinity using the IOT Monitoring system. This technology would be extremely sensitive and simple to operate. Its rapid response time would provide better assistance to each individual user.

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ABSTRAK

Pada 2021 sejumlah 4,471 kes kehilangan kanak-kanak telah dilaporkan. Dalam usaha menangani masalah ini, kerajaan Malaysia mewujudkan Portal Kanak-Kanak Hilang. Kaedah pencegahan akan melengkapkan usaha kerajaan. Tesis ini menerangkan peranti yang secara aktif menjejaki keberadaan si pemakai, iaitu kanak-kanak. Peranti ini terdiri daripada mikropengawal, GPS dan Modul GSM, sensor degupan jantung dan sensor DHT11. Kanak-kanak yang memakai gelang penjejak aktiviti dengan teknologi IoT dan GSM dipantau 24 jam sehari. Akibatnya, prototaip mencadangkan cara untuk menangani pertikaian berkaitan IoT di kalangan kanak-kanak. Idea ini mencadangkan "Gelang Penjejak Aktiviti" boleh pakai yang diperbuat dengan semua data yang diperlukan, termasuk tindak balas manusia seperti kemarahan, kebimbangan, kegelisahan dan ketakutan. Apabila mangsa berhadapan dengan senario ini, pelbagai sensor menjana isyarat kecemasan, yang dihantar ke telefon pintar. Teknologi ini berjaya memantau kehadiran kanak-kanak di zon yang diramalkan. Apabila seseorang memasuki zon pemantauan, GSM menghantar permintaan bantuan kepada ibu bapa dan individu di kawasan berhampiran menggunakan sistem Pemantauan IOT. Teknologi ini akan menjadi sangat sensitif dan mudah untuk dikendalikan. Masa tindak balas yang pantas akan memberikan bantuan yang lebih baik kepada setiap pengguna individu.

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LIST OF SYMBOLS

V	-	Voltage
RM	-	Ringgit Malaysia
A	-	Current
BPM	-	Beat Per Minute
C	-	Celsius
F	-	Fahrenheit
%	-	Percentage
H	-	Humidity



LIST OF ABBREVIATIONS

V	-	Voltage
IoT	-	Internet of Things
GPS	-	Global Positioning System
SMS	-	Short Message System
C	-	Celsius
F	-	Fahrenheit
BPM	-	Beat Per Minute



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CHAPTER 1

INTRODUCTION

The project history, identity, objective, scopes, and relevance are all covered in this chapter. This section will explain why we need this project and the problem we're seeking to solve. This project will explain how the idea came to be, what the project's goal is, what obstacles might arise during the project, and what benefits it could provide to society and community.

1.1 Background

The Internet of Things (IOT) is a system that includes a variety of physical devices such as automobiles, electrical parts, programming, sensors, actuators, and more. Its primary goal is to allow these devices to efficiently and intelligently connect these objects in order to acquire data and trade it for a specific purpose.

The Internet of Things (IOT) allows devices to be detected and connected remotely to monitor a network that already exists. Because of the convergence of many technologies, such as ubiquitous wireless communication, real-time analytics, sensors, embedded systems, and so on, the important vision of IOT has evolved. The Internet of Things (IOT) is a technology that allows products to be detected and operated remotely over existing system foundations that include a variety of devices.

These gadgets leverage a variety of existing technologies to acquire important data, which they then autonomously transfer to other devices [5]. In today's situation, over

80% of the whole population is accustomed to the new advancements, especially the youth, who use mobile phones, smart gadgets, laptops, and other brilliant technologies.

This project's main concept is based on advanced technology that provides a "Activity Tracker Wristband" that protects youngsters. Assaults on children, women, and the elderly have increased dramatically in recent years, and the number of unfortunate victims who are unable to contact the police or relatives due to a lack of a cell phone has significantly increased [4].

This proposed solution will outperform other existing techniques or gadgets on the market today in terms of assisting victims. Children wearing Activity Tracker Wristbands with access to IoT and GSM technology are monitored 24 hours a day, 7 days a week, in real time. The system includes sensors that are connected to the processor and continuously monitor important data such as heart rate, temperature, and so on. When potentially dangerous situations emerge, parents may be alerted.

1.2 Problem Statement

This model is proposing a framework which is helpful for ladies, kids, pets and furthermore for elderly. Yet in this undertaking we are even more concentrating on kids' wellbeing which is to follow the kids' actions and their condition while they are not in the perspective of their parents. Child tracking system is a device that can track and monitor their child's location and condition such as body temperature of the children and the heart beat rate of the children.

Child supervision is usually a challenge for parents who have to work all hours of the day and night. It will be difficult for the parent to know where their child is going or

Leaving during their working hours. When a parent is in the workplace, however, the child tracking system allows them to track and monitor their child's position with only one click on the program. It is critical for a parent to obtain information on their children when they are missing in order to prevent any bad events from occurring and to protect them 24 hours a day.

Following the death of Nurlin Jazlin in 2007, the topic of missing children has sparked widespread concern around the world. However, missing children instances are still common in Malaysia, particularly in Johor, Selangor, and Kedah, which have the greatest number of missing children cases [2].

In 2014, a total of 15 children were reported missing, with 1782 cases reported as of 2015 and 140 cases reported in early January 2016 [3]. Those data demonstrate the urgency of missing person's instances in Malaysia, necessitating parental concern. It's difficult to keep an eye on their child without using technology, especially when they're outside.

Even if a parent tries, he or she will not be able to avoid the mistakes that we will make in the future. We may deduce from our observations that today's parents are preoccupied with their cell phones, which may cause them to disregard their children for a few seconds or even a few minutes, putting their children at risk of going missing in just a few seconds out of sight.

There is a need for a solution that allows parents to track their child's location when they are not with them and receive alerts when their youngster arrives or departs from a specific place. Aside from that, Malaysian parents have a restricted number of system options to choose from.

Some devices are only functional in a specific country, and the required highlight may not fulfil Malaysia's parent's requirements. Even if they are available, most of the equipment must be imported, and the prices are in US dollars or Euros, which are rather expensive in Malaysian ringgit. However, while guardians are preoccupied with their jobs, they do not have enough time to monitor their children's well-being, thus this device comes in handy. The framework features a sensor interface with the processor that continues to detect important flags like heartbeat rate and temperature.

Furthermore, if a person crosses a zone (for example, a school zone) due to harassment, the system instantly transmits information to the parents and the local police station, notifying them of the problem's status. This method is known as geo fence, and it allows parents to choose the zone they desire for their children.

1.3 Project Objective

This project's major goal is to protect children when they are away from their parents or guardians, such as when they are out playing with their friends or returning from school. The following are the specific objectives:

- a) To develop a prototype project that can help to assist users in detecting the children's status such as temperature, heartbeat and location in the form of latitude and longitude.
- b) To develop applications for remote monitoring and alerting systems for parents regarding the condition of the children.

1.4 Scope of Project

The following is the project's scope:

- a) Parents and guardians that want to secure their children's location information.
- b) Parents and guardians who are concerned regarding the status of their children such as temperature, heartbeat and location.
- c) Teachers and tutors who are responsible for the children during the school session.



CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter examines the completed project in order to gain a deeper understanding of the project's design, conceptualization, specification, and any other relevant information. There are some reviews of the Children Tracking System that has been offered to complete this project in the later stages of this chapter. Each piece of literature will be evaluated in terms of connectivity for conveying messages or data, data readability, and marketability for Malaysians. These are the three primary characteristics that will be discussed in the literature that follows. Additional features will be identified and examined later, based on past literature, research, and project findings.

2.2 Review of Current Situation

The tracking system has been used in the market for both corporate and personal purposes all around the world. According to consumer research [14], there is an increasing trend for retailers to use the following technology to track their customers' purchasing habits in order to improve their service and encourage them to shop more frequently and spend more [14].

Furthermore, Waze, the world's largest community-based traffic and navigation software, revealed in 2014 that it had achieved 50 million users worldwide, with Malaysia

and Indonesia ranking among the top ten countries. These figures suggest that the tracking system has piqued the interest of the global market [11]. A personal GPS tracker was recently introduced to the market to deal with missing instances involving children, pets, and even older folks.

A personal GPS tracker assisted a mother in locating her autistic kid who had gone away after only two minutes of distraction. Furthermore, the GPS device has assisted a mother in receiving notification of her daughter's sexual assault. Despite the fact that there have been numerous cases of the personal GPS tracker being beneficial to people, a recent survey of 1130 parents in the UK found that 43 percent of respondents had decided against using location tracking, while 39 percent of respondents had never heard of location tracking, 16 percent of respondents were in favor of location tracking, and only about 1.7 percent were opposed.

According to the survey's findings, many people in the United Kingdom are still unaware of location monitoring, if they are aware of it at all. Furthermore, as noted in one of the articles, there will be differences in the characteristics of the technology based on the social environment, even with the same pricing levels and technological capabilities for the same child location monitoring device.

There have been numerous investigations of the tracking system in various fields [8]. However, because the focus of this study is on the child tracking system, these will not be thoroughly examined and will only be mentioned when necessary. The focus of the review will be on the technology and features that will serve as a guide for developing the best method for tracking children in Malaysia.

This present system relies on a wireless mechanism for sending notifications and communicating via a secure network. The technique is centered on smartphones, which will be extremely helpful in assisting sufferers. It is not only alerting about attacks, but also in providing the exact location of the injured individual to the nearest police station so that required action can be taken.

Children will be given a smart phone with access to a GPS tracking device that will track their whereabouts and display the results on an LCD. The alert messages are also sent to the local police station and family members.

2.2.1 Design and Implementation of a Multipurpose Child Tracking System

This project proposes a tracking system capable of recognising numerous threats while multiple children are present, as well as attempting to overcome the limitations of current systems. There are two modules in the intended system: a parent module and a child module.

When a violation of child safety is detected, an explicit sensor in the tyke module will raise a flag. This flag will be delivered from these sensors to the controller, which will then send it to the parent module, which will make the appropriate decision and commence the infringement plan.

The parent can choose whether the system should work indoors or outdoors, and the parent module can then determine the distance between each child and their parent at any given time. The Global Positioning System (GPS) is utilized to calculate external distances while changing the RF amplitude. Signal is used to calculate indoor distance.