



IOT Innovation And Sustainability For Smart Blind Stick With GPS Tracker (GF-21), Ultrasonic Sensor To Detect An Object And For Distance Measuring Using Bluetooth (HC-05) Wireless Via Smartphone Based On IR Project Using Arduino UNO R3 For The Blind.

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SESI 2 2021/2022

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This report submitted to the Electrical Engineering Department in fulfillment of the requirement for a Diploma in Electrical Engineering

JABATAN KEJURUTERAAN ELEKTRIK

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CONFIRMATION OF THE PROJECT

The project report titled " IOT Innovation And Sustainability For Smart Blind Stick With GPS Tracker (GF-21), Ultrasonic Sensor To Detect An Object And For Distance Measuring Using Bluetooth (HC-05) Wireless Via Smartphone Based On IR Project Using Arduino UNO R3 For The Blind." has been submitted, reviewed and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

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“I acknowledge this work is my own work except the excerpts I have already explained to our source”

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DECLARATION OF ORIGINALITY AND OWNERSHIP

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2. I acknowledge that 'The Project above' and the intellectual property therein is the result of our original creation /creations without taking or impersonating any intellectual property from the other parties.
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Made and in truth that is recognized by;

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HAKIMI**

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the date:

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**ENCIK KHAIRUL NAPISHAM BIN
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ABSTRACT

This project was developed as see there are no initiative for blind person to make them feel save when they walk outside without guardians. The life of blind people is very difficult and challenging, they can't see an object in front them and sometimes they can get hit by object even human and it actually can lead to injured. The Smart Blind Stick is intended to help reduce the difficulties faced by blind people. The Smart Blind Stick will be embedded by sensor to senses any object or human in front of them. Besides that, the tendency to blind people get lost is very high because they can't see the road. With that use GPS (GF-21) to track where they go and this stick will inform the keeper the current location whenever they go to anywhere.

Nextly, with the measuring device used by the blind. The keeper can know the distance of an object in front of the Smart Blind Stick while the blind person uses the Smart Blind Stick to keep the safety of the blind person from the momentum that is in front. This is in the presence of assistive devices such as Ultrasonic Sensors to measure the distance using Bluetooth (HC-05) wirelessly via a mobile phone to a Serial Bluetooth Terminal Application.

Visually impaired people are faced with a lot of problems in their daily life due to their inability to see and move around. These individuals are ultimately dependent on others for assistance, or they may use a trained dog to help them navigate as they travel outdoors. This problem has motivated the development of the smart stick with the aim of providing a better alternative to assist the visually impaired. This is achieved by novel connection of an Ultrasonic Sensor and a Buzzer. When The Smart Blind Stick senses an obstacle, the Buzzer activated, the Led activated and the user is alerted. The alert is in the forms of sound and vibration from the Buzzer . The system is designed and programmed using Arduino UNO R3 programming language. With the help of the proposed novel technology, the visually impaired individual can live independently and move freely, easily, and safely without any assistance required. After some rigorous tests, the system is proven to be efficient and cost effective.

Keywords : Ultrasonic Sensors, Anzen Stick, Bluetooth (HC-05), Buzzer, Led, Arduino UNO R3, GPS (GF-21), Apps (GPS 365) And Serial Bluetooth Terminal.

ABSTRAK

Projek ini dibangunkan memandangkan tiada inisiatif untuk orang buta untuk membuat mereka berasa selamat apabila mereka berjalan di luar tanpa penjaga. Kehidupan orang buta adalah sangat sukar dan mencabar, mereka tidak dapat melihat objek di hadapan mereka dan kadang-kadang mereka boleh terkena objek walaupun manusia dan ia sebenarnya boleh menyebabkan kecederaan. Smart Blind Stick bertujuan untuk membantu mengurangkan kesukaran yang dihadapi oleh orang buta. Tongkat Buta Pintar akan dinamakan oleh penderia untuk mengesan sebarang objek atau manusia di hadapan mereka. Selain itu, kecenderungan orang buta tersesat adalah sangat tinggi kerana mereka tidak dapat melihat jalan raya. Dengan itu gunakan GPS (GF-21) untuk menjejak ke mana mereka pergi dan kayu ini akan memaklumkan kepada penjaga lokasi semasa apabila mereka pergi ke mana-mana sahaja.

Seterusnya, dengan alat pengukur yang digunakan oleh orang buta. Penjaga boleh mengetahui jarak sesuatu objek di hadapan Smart Blind Stick manakala orang buta menggunakan Smart Blind Stick untuk menjaga keselamatan orang buta daripada momentum yang berada di hadapan. Ini adalah dengan adanya peranti bantuan seperti Penderia Ultrasonik untuk mengukur jarak menggunakan Bluetooth (HC-05) secara wayarles melalui telefon mudah alih ke Aplikasi Terminal Bluetooth Bersiri.

Orang cacat penglihatan berhadapan dengan banyak masalah dalam kehidupan seharian mereka kerana ketidakupayaan mereka untuk melihat dan bergerak. Individu ini akhirnya bergantung kepada orang lain untuk mendapatkan bantuan, atau mereka mungkin menggunakan anjing terlatih untuk membantu mereka menavigasi semasa mereka mengembara di luar rumah. Masalah ini telah mendorong pembangunan tongkat pintar dengan tujuan untuk menyediakan alternatif yang lebih baik untuk membantu golongan cacat penglihatan. Ini dicapai dengan sambungan baru Penderia Ultrasonik dan Buzzer. Apabila The Smart Blind Stick merasakan halangan, Buzzer diaktifkan, Led diaktifkan dan pengguna dimaklumkan. Amaran adalah dalam bentuk bunyi dan getaran daripada Buzzer. Sistem ini direka bentuk dan diprogramkan menggunakan bahasa pengaturcaraan Arduino UNO R3. Dengan bantuan teknologi novel yang dicadangkan, individu cacat penglihatan boleh hidup berdikari dan bergerak dengan bebas, mudah, dan selamat tanpa sebarang bantuan diperlukan. Selepas beberapa ujian yang ketat, sistem ini terbukti cekap dan kos efektif.

Kata kunci : Penderia Ultrasonik, Anzen Stick, Bluetooth (HC-05), Buzzer, Led, Arduino UNO R3, GPS (GF-21), Aplikasi (GPS 365) Dan Terminal Bluetooth Bersiri.

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LIST OF ABBREVIATIONS

1. Bluetooth (HC-05)
2. GPS (GF-21)
3. Anzen Stick (The Smart Blind Stick)
4. Ultrasonic Sensor (HC-SR04)

CHAPTER 1

1 INTRODUCTION

1.1 Introduction

Vision is the most important part of human physiology as 83% of information human being gets from the environment is via sight. Based on report Sinar Harian on 4 October 2018, at least one individual in the country is at risk of having blindness every week due to eye diseases such as diabetes Retinopathy (diabetes eye disease), Glaucoma (eye disorders due to high intraocular pressure) and cataract. Head of Ophthalmology Department of Sultanah Aminah Hospital Johor Bahru Dr Francesa Martina Vendargon said the average risk of blindness often attacks individuals aged 40 years and over. The life if blind people is very difficult and challenging, they can't see an object in front them and sometimes they can get hit by object even human and it actually can lead to injured. The number of visually impaired people are expected to grow in the future due to various reasons. Visual information is the support for most navigational tasks, so visually impaired people are facing difficulties because of lack of necessary information about the surrounding environment and atmosphere. Physical movement is a challenge for visually impaired persons, because it can become tricky to distinguish where he is, and how to get where he wants to go from one place to another. To navigate unknown places that he will bring a sighted family member or his friend for support. Over half of the legally blind people in the world are unemployed. Because limited on the types of jobs they can do. They have a less percentage of employment. They are relying on their families for mobility and financial support.

One of the initiatives is for blind person to make them feel save when they walk outside without guardians is Smart Blind Stick . The Smart Blind Stick is intended to help reduce the difficulties faced by blind people. This The Smart Blind Stick will be embedded by sensor to senses any object or human in front of them. Nextly, with the measuring device used by the blind. The keeper can know the distance of an object in front of the Smart Blind Stick while the blind person uses the Smart Blind Stick to keep the safety of the blind person from the momentum that is in front. This is in the presence of assistive devices such as Ultrasonic Sensors to measure the distance using Bluetooth (HC-05) wirelessly via a mobile phone to a Serial Bluetooth Terminal Application. The tendency to blind people got lost is very high because they can't see the road. With that I am use GPS (GF-21) to track where they go and GPS (GF-21) will inform the keeper the current location whenever they go to anywhere. It is not much helpful for them in order to avoid obstacles, The Smart Blind Stick for Blind people in which visually impaired person can be able to detect the object from a further distance, the measure the distance using Bluetooth (HC-05) wirelessly via a mobile phone to a Serial Bluetooth Terminal Application with could avoid it using Ultrasonic Sensors, and if Blind people are lost, using GPS (GF-21) modules their family members can track blind people easily.

1.2 Background Research

Provides an overview of this project as a whole containing a background about the project, objectives, problem statement, scope of the project, project significance, chapter summary and references include appendices. Moreover, contain brief introduction about the blind person as well as literature review discussion about work from source people until the result of a own handiwork project that is IOT Innovation And Sustainability For Smart Blind Stick With GPS Tracker (GF-21), Ultrasonic Sensor To Detect An Object And For Distance Measuring Using Bluetooth (HC-05) Wireless Via Smartphone Based On IR Project Using Arduino UNO R3 For The Blind. Next, specify the design a description on the components used. After that, present the results obtained from the system implementation and a brief discussion on these results. The conclusion of the project and goodness and effectiveness as well as high quality of the developed project.

1.3 Problem Statement

Blind person has trouble to maintain daily activity, lots of difficulties get raised while they are travelling from one place to another place. The most important one is detection of the obstacles when they are walking. Since they cannot see, they often get hit by objects in roads like poles, walls, cars, people etc. as a result they may severely injured.

In line with that, to navigate unknown place, blind people will bring a sighted family member or his friend for support. There are chances that blind people can get lost. In such cases, it is very difficult for their family members to find blind people. One of troublesome problem is, blind people forgot where put their put stick.

After that, blind people can't easily recognize obstacles or stairs while using normal blind stick. Next, no safety features on the normal blind stick.

In conclusion, can't locate the location of the normal blind stick user when they are having an emergency problem or lost in a public area.[11]

1.4 Research Objectives

There are a few also learned how to develop a prototype hardware for Smart Blind Stick, to help the blind people navigate the route at their best, to reduce the risk of injuries and lost for the visually impaired person, to creating a suitable software for the visually impaired person, to study a system that can help blind people to walk properly without getting hurt, to implement and design a system that can help keeper to find out where blind people go using GPS (GF-21) and to detect any obstacle in front them using sensor detection, to test the effectiveness and beneficial of the system to blind people and people close by and to measure the distance of the Smart Blind Stick with the obstacle in front.[9]

1.5 Scope of Research

Visual impaired person that having trouble to navigate. After that, Blind People is give direction to the guardian. In conclusion, The guard who guards the blind and can view where blind people go. And, project the title is IOT Innovation And Sustainability For Smart Blind Stick With GPS Tracker (GF-21), Ultrasonic Sensor To Detect An Object And For Distance Measuring Using Bluetooth (HC-5) Wireless Via Smartphone Based On IR Project Using Arduino UNO R3 For The Blind will be completed within 14 week , cost of developing project is RM 399.94 , hardware resources are available for four months.[12]

1.6 Project Significance

To prevent and reduce the risk of injuries and lost of the visually impaired person.

1.7 Chapter Summary

In this first chapter, I've described the background of the original idea for the beginning of this project. Then, I identified the problem statement about project. In addition, I have demonstrated the objectives of this project, scope of research, project significance. Finally, I came up with a project with the title IOT Innovation And Sustainability For Smart Blind Stick With GPS Tracker (GF-21), Ultrasonic Sensor To Detect An Object And For Distance Measuring Using Bluetooth (HC-05) Wireless Via Smartphone Based On IR Project Using Arduino UNO R3 For The Blind.