

**POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH**

**DESIGN A FINGERS EXERGAME TO IMPROVE  
FINE MOTOR SKILL FOR AUTISTIC  
CHILDREN USING ARDUINO**

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**JABATAN KEJURUTERAAN ELEKTRIK**

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**POLITEKNIK**

**SULTAN SALAHUDDIN ABDUL AZIZ SHAH**

**FUTURE BLIND STICK WITH ULTRASONIC  
SENSOR TO DETECT OBSTACLE AND GPS & GSM**

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

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The project report titled "Design a Fingers Exergame to Improve Fine Motor Skill for Autistic Children Using Arduino" has been submitted, reviewed and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

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## **ABSTRACT**

The study focusses on a simple method of detecting the obstacle and route by using an ultrasonic sensor that can detect a hole or stair with maximum range about 1 foot. As we can see, blind people are having their trouble to do their life routines because they can't see even a single thing. With our idea, we want to help this kind of people to live their life freely. This modern blind stick has a several feature that surely can help this blind people to navigate routes and detect an obstacle that surely can make their life routines easier. The user just needs to use the blind the normal blind stick, the different is, blind people can detect a hole or stair faster and easily. Besides that, guardian or parent also can locate the location of the stick user using Global

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Positioning System (GPS) and Global System for Mobile Communication (GSM) module.

**Keywords:** ultra-sonic sensor, Global Positioning System(GPS), Global System for Communication (GSM)

## ABSTRAK

*Kajian memfokuskan kepada kaedah mudah mengesan halangan dan laluan dengan menggunakan ultrasonik sensor yang boleh mengesan lubang atau tangga dengan jarak maksimum kira-kira 1 kaki. Seperti yang kita lihat, buta orang ramai menghadapi masalah untuk melakukan rutin hidup mereka kerana mereka tidak dapat melihat walaupun satu perkara. Dengan idea kami, kami ingin membantu orang seperti ini menjalani kehidupan mereka dengan bebas. Tongkat buta moden ini mempunyai beberapa ciri yang pastinya boleh membantu orang buta ini untuk menavigasi laluan dan mengesan halangan yang pastinya boleh memudahkan rutin hidup mereka. Pengguna hanya perlu menggunakan buta tongkat buta biasa, yang berbeza ialah, orang buta boleh mengesan lubang atau tangga dengan lebih cepat dan mudah. Selain itu, penjaga atau ibu bapa juga boleh mencari lokasi pengguna kayu menggunakan Global Sistem Penentuan kedudukan (GPS) dan Sistem Global untuk Komunikasi Mudah Alih (GSM) modul .*

***Kata kunci:*** *sensor ultra sonik, Sistem Kedudukan Global (GPS), Sistem Global untuk Komunikasi (GSM)*

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# CHAPTER 1 1 INTRODUCTION

## 1.1 Introduction

Nowadays, visually impaired person suffer from serious visual impairments preventing them from travelling independently. Accordingly, they need to use a wide range of tools and techniques to help them in their mobility. One of these techniques is orientation and mobility specialist who helps the visually impaired and blind people and trains them to move on their own independently and safely depending on their other remaining senses. Recently, many techniques have been developed to enhance the mobility of blind people that rely on signal processing and sensor technology. According to the literature, the mainly classified into two major aspects: sonar input (infrared signals, or ultrasonic signals). The way these devices operate just like the radar system that uses ultrasonic fascicle or sonar to detect the obstacle of fixed and moving objects. The distance between the person and the obstacles is measured by the time of the wave travel. However, all existing systems inform the blind of the presence of an object at a specific distance in front of or near to him. Information about the object characteristics can create additional knowledge to enhance space manifestation and memory of the blind. To overcome the above mentioned limitations, this work offers a simple, efficient, configurable electronic guidance system for the blind and visually impaired persons to help them in their mobility regardless of where they are, outdoor or indoor. The originality of the proposed system is that it utilizes an embedded vision system of three simple ultrasonic sensors and brings together all reflective signals in order to codify an obstacle through PIC microcontroller(Arduino Uno R3). Hence, in addition to distance the proposed guidance system enables the determination of two main characteristics of the obstacle which are material and shape. Furthermore, to assist in tracking the location, this modern blind stick utilizes GPS to determine the location and send it via SMS to locate the location of the user Modern Blind Stick provide blind people to detect the obstacle and locate the person where they are.

## 1.2 Background Research

The purpose of this project is to detecting the obstacle and route by using ultrasonic sensor that can detect a hole or stair with maximum range about 1 feet. With my idea, i want to help this kind of people to live their life freely. This modern blind stick have a several feature that surely can help this blind people to navigate and detect an obstacle that surely can make their life routines easier. The user just need to use the blind the normal blind stick , the different is , visually impaired person can detect a hole or stair more faster and easily. Besides that, guardian or parent can locate the location of the stick user using GPS and GSM module by sending SMS to the stick.

## 1.3 Problem Statement

- I. Blind people can't easily recognize obstacles or stairs while using normal blind stick .
- II. No safety features on the normal blind stick

- III. Can't locate the location of the normal blind stick user when they are having an emergency problem or lost in a public area .

#### **1.4 Research Objectives**

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

#### **1.5 Scope of Research**

Visual impaired person that having trouble to navigate.

#### **1.6 Project Significance**

The importance for this project to ensure that the ultrasonic sensor to detect the obstacle in 1 feet in front of the stick so that the user can notify that there have something in front of them. In 2011, The author convinced the Global Positioning System (GPS) is to identify the position and orientation and location of the blind person any of those solutions rely on GPS technology. The author focused on the GPS to make use of the data stored to compare with the destination location of the user. By this it can trace out the distance from the destination and produce an alarm to alert the user in advance. To make the circuit work, I use Arduino Nano for another embedded system so that the GPS will work.

#### **1.7 Chapter Summary**

In this chapter, the importance for project is we need to know our objective so the can finish the way we want. In addition, the purpose for research is we can make something better than before.