# ELECTRICAL ENGINEERING DEPARTMENT

# POLITEKNIK SEBERANG PERAI

## TITLE: GSM BASED TRACKER FOR BLIND PEOPLE

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## DIPLOMA IN ELECTRONIC ENGINEERING (COMPUTER)
## POLITEKNIK SEBERANG PERAI
## DECEMBER 2016

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# DECLARATION

TITLE : **GSM BASED TRACKER FOR BLIND PEOPLE**

SESI : **DECEMBER 2016**

We     **1. MISYALNI A/P MOHANARAJA**
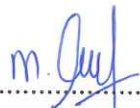
         **2. SANTHIYA A/P SELVARAJA**

are final semester students of Diploma in Electronic Computer Engineering, in Polytechnic Seberang Perai, Jalan Permatang Pauh, 13500 Permatang Pauh, Pualu Pinang.

2. We agree that "GSM Based Plant Watering System" and

intellectual property contained within it are the work / design of us

without taking or imitate any intellectual property rights of others.

3. We agreed to relinquish ownership of intellectual property of' GSM BasedTracker For Blind People using Mini Arduino Pro and GSM' to Polytechnic Seberang Perai to meet the needs of completion in Diploma in Electronic Engineering (Computer) Engineering Studies to us.

Made and truthfully recognized by;

     a)   MISYALNI A/P MOHANARAJA        .......................
          (10DTK14F1064)                  (MISYALNI A/P MOHANARAJA)

     b)   SANTHIY A/P SELVARAJA         .......................
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# ABSTRACT

The aim of the project is to provide the navigation information via audible messages and haptic feedback to the visually impaired people helping them to improve their mobility independently. The system with portable self-contained feature that allows the blind people to travel through familiar and unfamiliar environment. The proposed system consists of hardware and software. All the operations can be made with this touch screen. The major components are the GPS receiver and path detector used for receiving the current position and finding the current position and finding the shortest path to the destination. The navigation process of the system will start once the user gives the destination as in press button. The system is provided with an emergency button which will trigger an SMS that will send the present location of the user (GPS coordinates) to a remote phone number asking for help, in case emergency. This project will help the blind people in improving their communication ability and not to depend on none during walking in even unknown areas.

# ABSTRAK

Dalam projek kami, kami telah memilihuntuk menjalankan projek yang berkaitan dengan rakyat kecacatan mata. Tujuan projek ini adalah untuk memberikan maklumat navigasi melalui mesej yang boleh didengar dan maklum balas haptic kepada orang cacat penglihatan membantu mereka untuk meningkatkan mobiliti mereka secara bebas. Sistem yang dicadangkan terdiri daripada perkakasan dan perisian. Komponen utama ialah pengesan GPS penerima dan jalan yang digunakan untuk menerima kedudukan semasa dan mencari kedudukan semasa dan laluan terpendek ke destinasi kejadian. Proses navigasi. Selain itu, sistem ini disediakan dengan butang kecemasan yang akan mencetuskan dan SMS yang akan menghantar lokasi semasa pengguna untuk nombor tlefon yang jau meminta bantuan ketika dalam kecemasan. Akhir Sekali, projek ini akan membantu rakyat kecacatan mata dalam meningkatkan keupayaan komunikasi mereka dan tidak bergantung kepada sesiapa ketika berjalan walaupun dikawasan yang tidak diketahui.

# ACKNOWLEDGEMENT

In performing our final year project, we had to take the help and guideline of some respected persons, who deserve our greatest gratitude. The completion of this assignment gives us much pleasure. We would like to show our gratitude to Mr. Hamadi bin Ahmad, project coordinator, for giving us a good guideline for project throughout numerous consultations. We would also like to expand our deepest gratitude to all those who have directly and indirectly guided us in writing this assignment.

In addition, a thank you to our project supervisor Madam Nurulhidayah Bt Ahmad Shairazi, who introduced us to the Methodology of work, and whose passion for the 'underlying structures' had lasting effect. We also thank the Institute of Polytechnic Seberang Perai for consent of introducing a platform to develop a project.

Many people, especially our classmates and team members itself, have made valuable comment suggestions on this proposal which gave us an inspiration to improve our assignment. We thank all the people for their help directly and indirectly to complete our assignment

# CHAPTER 1

# INTRODUCTION

## 1.1 INTRODUCTION TO THE SYSTEM

In past few years there is a rapid growth in this system. The user communicates with the centralized unit through SMS. The centralized unit communicates with the system through SMS which will be received by the GSM with the help of the SIM card. Global system for mobile communication (GSM) is one of the most trustable wireless communication system that can be accessed and used very easily. The price of the trans-receiver module and subscription fee of the services is very low so it is very cost effective also. Embedded system interfaced with GSM module and GPS tracker can widen the scope of embedded design and enhanced the application areas of controlling and monitoring systems to a great extent. After processing, this data is displayed on the LCD the latitude and longitude. Thus in short whenever the system receives the activation command from the subscriber it checks all the field conditions and gives a detailed feedback to the user and waits for another activation command to start the motor. The main criteria of this project is to track the blind people using GPS tracker and the GSM module when they are in an emergency or lost track. As this report presents the design for the system which includes microcontroller, GPS tracker, GSM module, Buzzer and the circuit designs.

## 1.2    RESEARCH BACKGROUND

In today's environment, many people are having a busy workload day, than were using to, feeling the crunch. It might not be able to control the workload by the human, but it can be controlled on how we react and decide on it. People can be choosed to be overwhelmed, or it can be choosed to accept where we are today, while taking steps to improve the situation. In order to cope with all the situations, as a human being need to be prepared with fresh ideas. There is a way that can help to enhance ourselves and to relax our mind. This system to help and encourage people to take care of their blind family member easily. This projects will be implementing using Mini Arduino PRO. Moreover, with the help of GPS we could easily locate their latitude and longitude and automatically the GSM trigger the location to the phone. It is just by having a secure life to the people in our home. We could stop worrying about them. There is an idea to overcome all this in our daily life.

## 1.3 PROBLEM STATEMENT

Can we automatically navigate the blind people in my family when I am going to my work or do I have to bother my neighbors or relative to assist them always? Sometimes the neighbor or relatives don't really take the initiative on taking care of them well. There are timer based devices available which navigate the blind people on a set of interval. As we know if the people is in emergency or have lost themselves somewhere by just staying in our places? Can we manually find the blind people from remote location?

The answer is "Yes, we can" to the entire above problem. The solution provided is simple and economical. It requires to know little bit of electrical and electronics.

## 1.4 OBJECTIVE

The objectives of the project are to produce a GPS based tracker for blind person using GSM modem that will:

i. To detect exact position of blind people so that can help them rescue during Emergency.

ii. To provide a safety environment for them as we can always notify their location.

iii. Don't have to wait for the outsiders to help the disable person to contact us during emergency.

## 1.5    RESEARCH QUESTION

This study will answer the following research questions:

- Do the GSM based Tracker for Blind people a user friendly?

- Does GSM based tracker for the Blind people makes human work easier?

- Did the security of the Blind People increased?

## 1.6    PROJECT SCOPE

GPS track from time to time no matter where or how buy we are. Helps to save the fauna. Moreover, this project allows us to save the blind people in all type of situation. Transmission of signal is that how to transmit a signal from the circuit and to track the blind people. This system will act like a medium of communication between the system and blind people. This system will allow the owner of the blind people to locate easily when they are in need of help. It is amazing that I can monitor the activity by just setting the coding to make an instruction. Program is about development of the simple program to detect a signal at the parallel port from the transmission of the circuit..

This project uses:

- GPS Tracker
- GSM Module Sim 900
- Buzzer
- Mini Arduino Pro

Input:

- As the input, it uses the Mini Arduino Pro ( ) which starts the system.

Process:

- GPS which had been used as the medium of signal it will collect the latitude and longitude to the signal and send the information to the Mini Arduino Pro.
- The Mini Arduino Pro send the latitude and longitude to the GSM.

Output:

- GSM which had been used as the user sends the message to the phone and notifies it to see the latitude and longitude.

## 1.7 PROPOSED SOLUTION

In order to solve the problem that are facing now, as proposed project of a smart detecting system called as 'GSM Based Tracker for Blind People'. The 'GSM Based Tracker for Blind People is a simple and easy to use to detect the blind people. Instead of using traditional or manual way to locate them during an emergency, proposed some ideas that injected some intelligent on it to make it more intelligent by the helps of internet. For the system functionalities, it will make sure that the user will be at ease when using this system and it will provide a very user-friendly system to use.

## 1.8    SYSTEM LIMITATION

The proposed system causes a lot of uncertain situations. For example without the power supply, these systems will be not functioning due to it is fully dependent to the power supply. Besides, the limitation of this system is, if there is any network problem the chances of sending and receiving the message will be interrupted.

## 1.9    Importance of the Project

God gifted sense to human being which is an important aspect in our life is vision. We are able to see the beauty of nature, things which happen in day-to-day life with the help of our eyes. There are some people who lack this ability of visualizing these things. They face many difficulties to move on with their daily life. The problem gets worst when they move to an unfamiliar location. Visually impaired people face many challenges when moving in unfamiliar public places. Only few of the navigation system for visually impaired people can provide dynamic interactions. None of these systems work perfectly for outdoors. Propose navigation device for the visually impaired people that help them in travelling from one location to another. This focuses on designing a device for visually impaired people that can help in travelling independently comfortable to use. The device is linked with a GPS to identify the location of the blind person. An emergency button is also added to the system. The whole device is designed to be small. So it is easy for the blind people to used.

## 1.10 CONCLUSION

By end of this chapter we have identified the problem that we have to overcome and had a clear vision on the project that we have to work on. Other than that we have also created and set a clear view of OBJECTIVES and also the IMPORTANCE of the project that had been done to follow the flow of the project as this gives the clear overview of the project. We also provided our project scope and also the limitations to make it more understandable and executable.

# 2.0 THE LITERATURE REVIEW

## 2.1 INTRODUCTION

In this chapter, the discussion will highlight several literatures that are related to this project area. It includes the detailed descriptions technique and approach that will be discussing can be vised as a guidance or guideline to develop prototyping of the **GSM BASED TRACKER FOR BLIND PEOPLE.**

The literature review also focus on the understanding of relevant topic to convey the knowledge and ideas that have been established based on journals, articles and web sites that are related to methodologies and approaches. Besides that, this section describes other similar or relevant project that related to the **GSM BASED TRACKER FOR BLIND PEOPLE.** Other than that, software and hardware design review also being pinpointed under literature review section.

## 2.2 CONCEPT AND THEORIES OF EXISTING MODELS

The increasing population and development there are a number of obstacles which occur and can cause collisions which is a big threat to blind people. It is necessity these days to provide security and safety to Blind people. There have been few ways and devices designed to help the blind people. Technology provides to all sorts of needs of the human today. Therefore applying the existing technologies can provide a solution to the stated problem. There are two systems for localization and positioning of vehicles using GPS and GPRS technology and some other devices. They are developed for sending command to the system in the form of SMS by system registered cell phone and the system responds it by transmitting its current coordinates in the form of Latitude and Longitude using a reply SMS to same cell phones. This project presents a theoretical model and a system concept to provide a smart electronic aid for blind people.

## 2.3 RESEARCH AND EXPERIMENT

**Journal 1**

| YEAR | AUTHOR | TITLE | OBJECTIVE | CRONOLOGI |
|---|---|---|---|---|
| January-March 2013 | by D. G. Agarwal G. S. Gujrathi | GPS and GSM Based Voice Alert System for Blind People | The system supports GPS with user input interfacing to get alert for few places is a microcontroller based device which intellectually find the location in which it was currently located and gives the alert to the blind man if it was his destination area. GPS is the acronym for Global Positioning System. It is employed to find the position where the user is located on the earth. This information is provided by the GPS with the help of the data it receives from the satellites. Microcontroller is the heart of the device. It stores the data of the current location which it receives from the GPS system. | The GSM based detecting system may offer users the flexibility to regulate and control the operations of their detecting systems with little intervention to reduce runoff from over tracking for improvement. This enables users to take advantage of the globally deployed GSM networks with its low SMS service cost to use mobile phones and simple SMS commands to manage their irrigation system. It will be possible for users to use SMS to monitor directly the conditions of their family member. This will help minimize the missing rating. |

Journal 2

| DATE | AUTHOR | TITLE | OBJECTIVE | CRONOLOGI |
|---|---|---|---|---|
| June 2015 | By Siddiqur Rahman Tanveer | Android assistant for blind tracker | Blind mobility is one of the main brainstorming challenges that scientist are still facing around different parts of the world and still researching to implement suitable blind assistive devices. In recent years blind mobility had become an important issue since a large number of people are visually impaired and partially sighted. | The navigation of a bind person is a great challenge as blind person has to rely on other. The simplest and most widely used travelling aid used by all blinds is the white cane. It has provided those people with a better way to reach destination and detect obstacles on ground, but it cannot give them a high guarantee to protect themselves from all level of obstacles. Sometimes, it happens that blind people are lost and their guardians are in tension about them. There has been many efforts but even now it is not easy for the blind people to move independently from one place to another. To solve this great problem it has been studied by many researches about support instruments for eye-sight. |

**Article 1**

| DATE | AUTHOR | TITLE | METHOD | WEBSITE |
|---|---|---|---|---|
| August 2015 | By Pankaj Patil, Kunal Bonage, Bhimsen Gire, Pranjali R Phirke | Blind Navigation For Blind People | This project is to provide a assistance to blind people. Its going to develop a intelligent system that works efficiency good in outdoor. Current navigation device for the visually impaired focuses on travelling from one location to another, this system focuses on designing a device for visually impaired people that help them to travel from one location to another. This device is used to help blind people to move with the same confidence as a sighted people. | http://www.arresearchpublication.com |

## 2.4 ELECTRONIC COMPONENTS
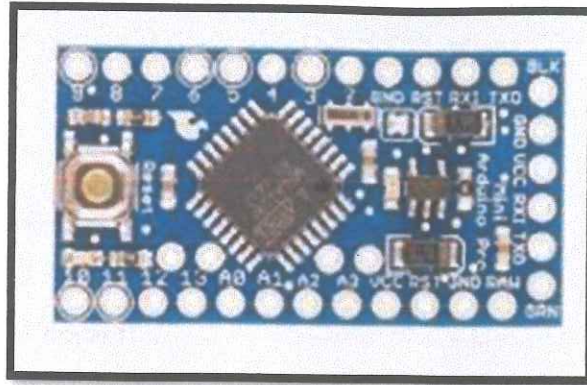
### 2.4.1 Mini Arduino PRO



**Figure 1:Mini Arduino Pro**

**Power:**

The Mini Arduino Pro can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector. The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

The power pins are as follows:

• VIN. The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

• 5V. The regulated power supply used to power the microcontroller and other components on the board. This can come either from VIN via an on-board regulator, or be supplied by USB or another regulated 5V supply.

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• 3V3. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

• GND. Ground pins.

## Memory:

The Atmega328 has 32 KB of flash memory for storing code (of which 0,5 KB is used for the bootloader); It has also 2 KB of SRAM and 1 KB of EEPROM (which can be read and written with the EEPROM library).

## Input and Output:

Each of the 14 digital pins on the Uno can be used as an input or output, using pinMode(), digitalWrite(), and digitalRead() functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40 mA and has an internal pull-up resistor (disconnected by default) of 20-50 kOhms. In addition, some pins have specialized functions:

• Serial: 0 (RX) and 1 (TX). Used to receive (RX) and transmit (TX) TTL serial data. TThese pins are connected to the corresponding pins of the ATmega8U2 USB-to-TTL Serial chip .

• External Interrupts: 2 and 3. These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value. See the attachInterrupt() function for details.

• PWM: 3, 5, 6, 9, 10, and 11. Provide 8-bit PWM output with the analogWrite() function.

• SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK). These pins support SPI communication, which, although provided by the underlying hardware, is not currently included in the Arduino language.

• LED: 13. There is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off.

The Uno has 6 analog inputs, each of which provide 10 bits of resolution (i.e. 1024 different values). By default they measure from ground to 5 volts, though is it possible to change the

upper end of their range using the AREF pin and the analogReference() function. Additionally, some pins have specialized functionality:

• I 2C: 4 (SDA) and 5 (SCL). Support I2C (TWI) communication using the Wire library. There are a couple of other pins on the board:

• AREF. Reference voltage for the analog inputs. Used with analogReference().

• Reset. Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board.

### 2.4.2  GSM MODULE

GSM module SIM900A is being used in the project here. It is just like a cell phone with all the facilities of sending and receiving a message, sending and receiving calls. It has a communication that can be programmed using AT commands. The signal names for the GSM modem communication port include the following; audio input and output pins (for Connecting external hands free audio devices), mute control pin, flash programming signal pins, external power pins, and receiver and transmitter pins.

Here the RX and TX pins are used for the serial communication with the microcontroller. There are various AT commands to check the signal strength and connection and SIM status etc. Here the Hyper Terminal is used to initially interface with the computer to check the module. It also has an antenna to receive the GSM signal from the user's phone. The basic AT commands are loaded into the program of microcontroller for it to interface with the GSM module. The figure given below shows a GSM module.
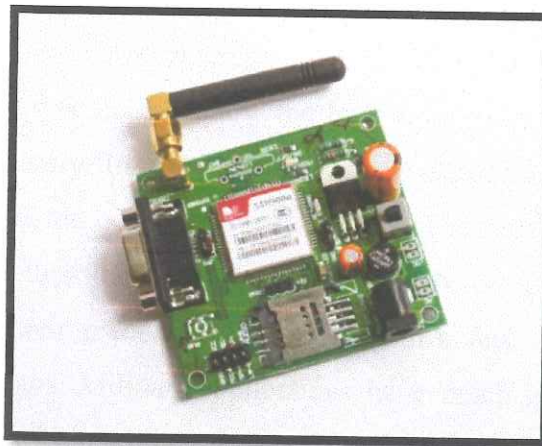


**Figure 2: GSM module**
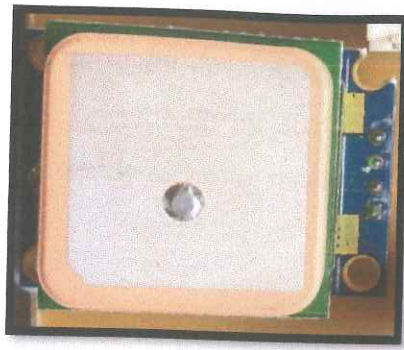
## 2.4.3 GPS TECHNOLOGY



**Figure 3: GPS Technology**

GPS or Global Positioning System is a network of orbiting satellites that send precise details of their position in space back to earth. The signals are obtained by GPS receivers, such as navigation devices and are used to calculate the exact position, speed and time at the vehicles location.GPS is well-known for its military uses and was first developed by the US to aid in its global intelligence efforts at the height of the Cold War.

Ever since the early 1980s, however, the GPS has been freely available to anyone with a GPS receiver. Airlines, shipping companies, trucking firms, and drivers everywhere use the GPS system to track vehicles, follow the best route to get them from A to B in the shortest possible time. The very first GPS system was developed in the 1960s to allow ships in the US Navy to navigate the oceans more accurately. The first system had five satellites and allowed ships to check their location once every hour. Today, portable Navigation device devices can give drivers their precise location to within a few meters, which is accurate enough to navigate roadways. Military applications have much higher precision so that a location can be pinpointed within a few centimeters.