Faculty of Electrical and Electronic Engineering Technology

i-SAJADAH WITH AUTOMATIC LOCATION TRACKER USING GPS

NUR FATIN SHAZWANI BINTI NOR RAZMAN

Bachelor of Electrical Engineering Technology (Industrial Automation & Robotics) with Honours

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A project report submitted
in partial fulfillment of the requirements for the degree of
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Tajuk Projek : Nur Fatin Shazwani Binti Nor Razman

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Disahkan oleh:

Ahmad Idil

(TANDATANGAN PENULIS)
Alamat Tetap: No 10, Jalan Lampam 25 Taman Tanjung Puteri Resort, 81700 Pasir Gudang, Johor.

(COP DAN TANDATANGAN PENYELIA)
AHMAD IDIL BIN ABDUL RAHMAN
Pensyarah Kanan
Jabatan Teknologi Kejuruteraan Elektrik
Fakulti Teknologi Kejuruteraan Elektrik Dan Elektronik
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I declare that this project report entitled "i-Sajadah with Automatic Location Tracker Using GPS" 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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Student Name : NUR FATIN SHAZWANI BINTI NOR RAZMAN

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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 Electrical Engineering Technology (Industrial Automation & Robotics) with Honours.

Signature : Ahmad Idil

Supervisor Name : TS. AHMAD IDIL BIN ABD RAHMAN

Date : 11/1/2022

Signature : Johar

Co-Supervisor Name (if any) : TS. JOHAR AKBAR BIN MOHAMAT GANI

Date : 13/01/2022

DEDICATION

Special dedicated to my beloved parents, friends and the most supported person, Fahmi Asyraf

ABSTRACT

Development of this i-sajadah with automatic location tracker by using GPS real-time location which is an automated system that can be used by all levels of society. This project is to develop the i-sajadah rakaah notification and smart monitoring with automatic location tracker while the system can display time for solah automatically by using GPS. The basic idea of this project by using GPS are real-time information. Many modern development systems calculate prayer times based on manual longitude rather than automatic load such as GPS. It means that people must know their longitude wherever they go in order to know when to perform their solah. By applying the automatic location tracker, it can be easier for users to figure out a dependable means to identify them, particularly for Muslims, in order to guide them to the prayer hour. Therefore, the continuation of the i-sajadah with Automatic Location Tracker using GPS will provide the efficient usage for every Muslim out there. The GPS will function to tell us the exact prayer time according to the current places. The improvement of this project is to propose a more user-friendly and efficient usage of the current system. This device consists of GPS module that help user trace their current location and the prayer time based on their location. In this project of i-sajadah with automatic location tracker using GPS will automatically display the time of prayer on LCD screen. This device consists of the Arduino software, Wi- Fi application, sensory component and GPS module. In a nutshell, the innovation of the i- sajadah with Automatic Location Tracker using GPS provides more efficient system in tracking our location for our daily prayer routines.

ABSTRAK

Pembangunan i-sajadah ini dengan pengesan lokasi automatik dengan menggunakan lokasi masa nyata GPS yang merupakan sistem automatik yang boleh digunakan oleh semua lapisan masyarakat. Projek ini adalah untuk membangunkan pemberitahuan i-sajadah rakaah dan pemantauan pintar dengan pengesan lokasi automatik manakala sistem boleh memaparkan masa solat secara automatik menggunakan GPS. Idea asas projek ini dengan menggunakan GPS ialah maklumat masa nyata. Banyak sistem pembangunan moden mengira waktu solat berdasarkan longitud manual dan bukannya beban automatik seperti GPS. Maksudnya, orang ramai mesti mengetahui garis bujur mereka ke mana sahaja mereka pergi untuk mengetahui masa untuk menunaikan solat. Dengan menggunakan penjejak lokasi automatik, lebih mudah bagi pengguna untuk memikirkan cara yang boleh dipercayai untuk mengenal pasti mereka, terutamanya bagi orang Islam, untuk membimbing mereka ke waktu solat. Justeru, kesinambungan i-sajadah dengan Automatic Location Tracker menggunakan GPS akan memberikan penggunaan yang cekap kepada setiap umat Islam di luar sana. GPS akan berfungsi untuk memberitahu kami waktu solat yang tepat mengikut tempat semasa. Penambahbaikan projek ini adalah untuk mencadangkan penggunaan sistem semasa yang lebih mesra pengguna dan cekap. Peranti ini terdiri daripada modul GPS yang membantu pengguna mengesan lokasi semasa mereka dan waktu solat berdasarkan lokasi mereka. Dalam projek i-sajadah dengan penjejak lokasi automatik menggunakan GPS ini secara automatik akan memaparkan waktu solat pada skrin LCD. Peranti ini terdiri daripada perisian Arduino, aplikasi Wi-Fi, komponen deria dan modul GPS. Secara ringkasnya, inovasi i- sajadah dengan Penjejak Lokasi Automatik menggunakan GPS menyediakan sistem yang lebih cekap dalam menjejak lokasi kita untuk rutin solat harian kita.

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First of all,I would like to thank Allah SWT, The Almighty, a place where I pray and surrender, who has given me strength and ability to complete the project on time. The success and outcome of this project required a lot of guidance and assistance from many people, and I am incredibly fortunate to have got this all along with the completion of this project.

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LIST OF SYMBOLS

D, d	-	Voltage angle
F	-	Force
g	-	Gravity = 9.81 m/s
I	-	Moment of inertia
l	-	Length
m	-	Mass
N	-	Rotational velocity
P	-	Pressure
Q	-	Volumetric flow-rate
r	-	Radius
T	-	Torque
Re	-	Reynold number
V	-	Velocity
w	-	Angular velocity
x	-	Displacement
z	-	Height
q	-	Angle

LIST OF ABBREVIATIONS

RTC	-	Real Time Clock
UART	-	Universal Asynchronous Receiver-Transmitter
OLED	-	Organic Light Emitting Diode
GPS	-	Global Positioning System

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CHAPTER 1

INTRODUCTION

1.1 Background

Nowadays, it's thought-about a standard state of affairs for the industries to use technology to the extent of a much better or lesser degree. In several cases, the nice functioning of the instrumentality, overall system and swish networks are the most key of the corporate to unendingly in operation with success. In straightforward words, the buyer or client are the neutral directly offered with the new technology service. albeit the organization has the mandatory technology for his or her operational tasks, this doesn't imply that it's effective or helpful. At any purpose, the extent of the fault incidence could increase to bound difficult settings or eventualities. because of that reason, it's essential to possess associate degree organized laptop design to manage its functioning, as a result of any errors that occur won't influence the service provided to the customers within the finish.

Since prehistoric times, humans are making an attempt to plot a reliable technique of determinant wherever they are, notably for Muslims, so as to help them in determinant the prayer time. The sun, moon, and stars area unit utilized by cavemen to work out their location. The previous position is crammed by succeeding person. compass and sextants area unit succeeding advancements within the good procedure. The needle of a compass perpetually purposes to the north point, whereas a sextant uses associate degree adjustable mirror to live the angle of the sun, stars, and moon. However, all of them simply show the latitude and not the great circle.

Radio-based navigation systems were developed within the early twentieth century. that were of times used throughout warfare II, there have been 2 choices that is use an occasional frequency radio radiation that might cowl an oversized space however was inaccurate, or use a high frequency radio radiation that might cowl an oversized space however was inaccurate. At the instant, the sole system capable of displaying an exact position on the world at anytime, anyplace, and all told weather is that the international Positioning System (GPS). it's normally used as a method for gathering spacial information. Existing digital files, maps which will be digitized, and, a lot of recently, GPS area unit key sources of special information. It may be wont to confirm the situation of one thing within the globe by providing great circle, latitude, and altitude information.

The i-sajadah with Automatic Location Tracker Using GPS has been designed to improve the previous project development which is the i-sajadah with Smart Monitoring System. This system is improved in its design by adding the beneficial automatic location tracker feature which is using GPS module. In addition, improving the previous project by adding the GPS module as automatic location tracker, it will ease user to perform their solah wherever they are. By improving the new features, a possible problem to perform solah when doing work outside of current places or being at nowhere can be solve.

1.2 Problem Statement

For Muslims, prayer is an important moment to express their gratitude to The Almighty. As a result, they are attempting to devise the simplest method of calculating the time of prayer based on the location of the sun. The advanced technology on GPS has contributed many new discoveries and made many things easier for the end-user, particularly in the area of position monitoring, and its accuracy is also used to navigate a course of directions to a destination. The capacity of GPS to precisely track location coordinates can

also be used to help a Moslem traveller who is going on a trip to a new location find the nearest mosque to do prayer. However, few solutions for a Moslem traveller for Mosque tracking systems have been offered, and how to handle the geometrics dilution of accuracy problem on signal retrieving while tracking mosques remains a difficulty[1]. Some of them produce software for mobile phones, software for PCs, and prayer azan clocks to meet the demand of easily knowing the prayer time, as mentioned in the literature review in the following chapter.

The basic ideas of the i-sajadah with prayer time system using GPS are real-time information. Many modern development systems calculate prayer times based on manual longitude rather than automatic loads such as GPS. It means that people must know their longitude wherever they go in order to know when to pray. Nonetheless, the issue persists. They are prone to human errors (both intentional and inadvertent), have higher costs, and lack real-time monitoring and regulation. Many challenges can be overcome by creating this project. It has the potential to provide precise position without having to worry about where you are and the weather. People can take it with them wherever they go because it is small in size. It provides an advantage to Muslims who wish to migrate from one country to another. There is no need for them to be concerned about the difficulties of determining prayer time because the technology automatically loads and calculates prayer time. They can get prayer time information from the LCD display. As a result, we will undoubtedly know the prayer time precisely, and it will be possible to improve the system that was previously researched and developed. Hence, the problem statement that produce the reason for the outcome idea which is the improvement that helps user to track prayer time according to their locations or coordinate such as Global Positioning System (GPS). User can bring the prayer mat anywhere without need to change the coding of prayer time due to changes of

location. The weakness of the previous project is one of the problem statement which is the previous i-sajadah is moveable but the monitoring system is fixed. Then the prayer time is fix based on one location that's mean the sajadah is not valid to use at another places.

1.3 Project Objective

The main aim of this project is to propose a systematic and effective methodology to estimate system i-sajadah with automatic location tracker using GPS with reasonable accuracy. Specifically, the objectives are as follows:

a) To develop *i-sajadah* rakaah notification and smart monitoring with automatic location tracker.
b) To develop a system that can display time for *solah* automatically by using GPS module
c) To perform an analysis performance on the *i-sajadah* in term of its functionality and precision on detecting location and displaying *solah* time correctly.

1.4 Scope of Project

Muslims all across the world conduct extensive research into location trackers that use GPS modules. Several techniques have been discovered. To reduce the scope of the research, the project has been confined to a specific area, *i-sajadah* using an automatic location tracker system based on a GPS module. The goal of this project is to display the prayer time on an LCD panel that is determined automatically. The GPS Module determines the user's location. The receiver's longitude and latitude data are utilized to calculate the prayer time, which happens automatically. The propose system will be integrated with two

previous project which is Ingenious Prayer Mat with smart *rakaah* notification device and the another one is *i-sajadah* with smart monitoring system. There is two targeted zone area which Ayer Keroh, the place where I am study and the second are is Johor Bahru which is my hometown for setting up this project. In this project, the limit region function is to make this project more easy to analyze the performance. The limit region also is to create one zone for the testing to the system.