



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 4, April 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

 ijirset@gmail.com

 www.ijirset.com

IOT BASED SMART HOVERBOARD

Ms.Fathimath Suhaila¹, Ms.Mishriya², Ms.Paavana M R³, Ms.Sambreena Banu⁴, Prof.Asif Mulla⁵

¹B.E Student, Dept. of ISE, YIT Moodbidri, Mangalore, Karnataka, India

²B.E Student, Dept. of ISE, YIT Moodbidri, Mangalore, Karnataka, India

³B.E Student, Dept. of ISE, YIT Moodbidri, Mangalore, Karnataka, India

⁴B.E Student, Dept. of ISE, YIT Moodbidri, Mangalore, Karnataka, India

⁵Professor, Dept. of ISE, YIT Moodbidri, Mangalore, Karnataka, India

ABSTRACT-A Gesture Dominated by Human Assistance Alternatively, there is the HOVERBOARD, which may be utilised both as a vehicle and a tram for transit tasks inside the sector. It mimics a skateboard for personal transportation but uses magnetic induction rather than the more common wheel-only design. To supply the transportation, the board levitates. The device's primary function is to move forward and to allow the wheel to turn in both directions. There are other secondary goals connected to it, including the usage of cameras inside of it for security purposes, among others. The two-wheel self-balancing hoverboard, which is famous for its zero turn radius, is the most popular type of hoverboard. Similar to the two-wheeled variant, the three-wheeled one can move.

KEYWORDS:Hoverboard, Accelerometer, gyroswivel wheel, Skateboard.

I. INTRODUCTION

The universal motto of engineering is "Improving the Quality of Life" of mankind without any limitations. Science and technology are required to make this change. There is a demand for a car that is affordable and environmentally friendly because of the rise in pollution and fuel prices. The finest vehicles for this purpose are hoverboards because they are affordable and environmentally friendly. Dean Kamen created the Segway Hoverboard, a two-wheeled, battery-operated electric vehicle that can balance itself. Segway Inc. of New Hampshire produces it.

Jack Barkenbus was the first to talk about the importance of switching to electricity for personal vehicle transportation. Every automaker is currently working to create an electrical car as we move away from using oil for personal mobility. Due to their higher cost and slower development, more complex technologies will take many years to produce a noticeable overall reduction in fuel usage. A hoverboard is a form of personal transportation.

that raises the user so they may move more smoothly. In general, hover boards are shown as looking like skateboards. Originally, the boards had wheels, but following revisions and the use of electromagnetic principles, the boards were created without wheels.

1.1 Objectives:

The apparatus was designed to move on powered wheels and be capable of turning on swivel caster wheels. While standing on the device, it was crucial for the user to maintain appropriate balance. The audience was not to see the batteries because they were supposed to be hidden underneath the apparatus, next to the wheels, and off the ground. An external party's cell phone or the user's hand gestures were to be used to control the device. The apparatus must provide balance while allowing the user to move forward and turn in both directions. The audience is only a few feet away from the artists, therefore it must also be very quiet.



II. LITERATURE REVIEW

[1] Electric Hover Board,

The process and processes used to create and develop an electric hoverboard are covered in this essay. The mechanical chassis design, a way to determine the necessary motor power rating based on the load, the potential use of various motors, techniques to regulate the BLDC motor's rotation, and closed speed control algorithms for BLDC motors are all discussed. Also covered are the design and development of the motor driver needed to construct a hoverboard. The design of the inverter, DC-DC converter, level shifter, and PCB manufacturing are all part of the development of the motor driver. After construction is complete, the motor is tested utilizing hysteresis for open loop control and closed loop control. Two hub motors and a battery pack power the hoverboard model that is the subject of this essay.

A handle bar is used to manage the vehicle's acceleration and deceleration. The mechanical design and construction of the hoverboard, the design of the motor controller (which includes designing the inverter to power the motor and selecting the control algorithm for motor control), and the selection of the battery rating as required by the motor as a whole are all steps in the development of a hoverboard from scratch. The right motors are selected when the requirements have been established.

[2] A Contactless Morse Code Text Input System Using Ambient Wi-Fi Signal:

This research paper presents a path-following, two-wheeled, portable robot with an Arduino Nano serving as the central driving functional unit. It also includes novel features for wireless control using WiFi and Bluetooth modules, as well as collision detection, avoidance, and control capabilities. These features give the robot the unique ability to avoid danger and fall from a height while maintaining improved stability and precise control.

In order to drive and align the robotic vehicle in the desired direction, our proposed model is a very highly efficient, low cost, low power (nine volts) consuming device operated by WiFi and Bluetooth. It also incorporates processing from feedback signals from the user side. Our model can be controlled manually from a distant mobile device using wireless technologies like Bluetooth and Wi-Fi, as well as control by every angle of tilting the phone. The graphical user interface created by the Java Portal is quite appealing with an improved visual platform that displays all of the robot's control directions, giving the robot a great degree of control and precision. Because we combined an Arduino Nano with incredibly lightweight parts and sensors that produce control signals, our design is really special. Each module and peripheral interface is perfectly synced with how it should operate.

[3] A Chat Application for Communicating with Hearing Impaired Persons:

This project was created to find a better, quicker, safer, and more affordable approach to clean the school field. The hardware for the device includes an Arduino Uno microcontroller, an HC-05 Bluetooth module, a WIFI module, two 12 volt wiper motors for the wheels, a 24 volt E-bike blade motor, a motor driver, two caster wheels, a switch, and two series-connected 12 volt 7 Amp lead acid batteries.

With the ENIRO app installed on an Android phone, the device can be utilized. Using MIT App Inventor, the ENIRO App was created. Bluetooth and WiFi connections are both useful for operating lawn mowers. Bluetooth can communicate over a distance of up to 58 metres (190 feet). The project evaluation. 20 reviewers rated it according to the following standards: The HIP can respond to text messages using texts and synthesized speech after seeing the texts or feeling tactile input portability, maintainability, functionality, reliability, usability, and reliability. The software portion focuses on creating programmes for the Arduino Uno microcontroller and developing Android applications for wireless transmission. They created a programme to operate the lawnmower using the MIT App Inventory. Bluetooth and WiFi connections can be used to control the project. The code is uploaded to the Arduino Uno microcontroller using the Arduino IDE. The lawn mower's case construction and blade, caster, and wheel installation are under the mechanical section's purview.

This paper's goal is to provide an illustration of a wearable device made with force-sensitive sensors. Six dots are used in the creation of the Braille text. It simulates the six-finger virtual keyboard needed for Braille typing. We shall type in this document using the three fingers on our hands, which are our index, middle, and ring fingers. In this study, the android device is receiving input through the Braille language medium.

The task of cutting the weeds is performed by the blade. Those who frequently use this type of instrument are more



vulnerable to injury from blades. The researchers offer housing that safely covers all the moving lawn mower components, including the speed cutting blades, and places where grass clippings can be safely discharged. The lawn mower can be effortlessly rolled over the grass thanks to the wheels' special construction. The tyres' cuts may be visible even in level parts of the field, but they may cut too low when making a turn, particularly when the field contains a little bump. The lawn mower may roll around rather easily because the caster wheel is often fastened to a big item.

[4] BrailleCharacterRecognitionBasedonNeuralNetworks:

Dean L. Kamen invented the segway, a three-wheeled vehicle, in 2001. It is capable of supporting both the rider's weight and self-balancing.

It has a control handle bar that is vertical to the platform and may be moved forward or backward to change the direction in which the segway moves. The device is primarily propelled by the rider's forward or backward motion. As there is no fuel utilised and rechargeable batteries are used in its place, this is an environmentally benign method of transportation for short distances. A segway takes up very little room and significantly lessens heavy traffic.

In our project, the prototype balances itself to show how the segway works. The Segway PT, which has three wheels, is the most well-known and often used type. It is an electric, self-balancing human transporter featuring a gyroscopic stabilisation and control mechanism that is computer-controlled. Two parallel wheels balance the gadget, which is moved by shifting body weight. The goal of this project is to create a tri-wheel electric segway that is extremely affordable, highly effective, and simple to use. (3) wheels Future-era electric scooters like the Segway are frequently employed in urban environments to carry users over short distances.[5]

Nonetheless, the three-wheeled vehicles are the most well-liked and frequently utilised ones. For the past few years, research on self-balancing hoverboards and two-wheel inverted pendulums has accelerated. It is unstable by nature and would eventually fall if left unchecked, rolling over the axis of the wheel. If the motor that powers the hover moves in the right direction, it will return to its original, stable position. The platform can maintain its upright vertical position and balance on a set of wheels thanks to an electromechanical technology that has been created. Commonly, a PID controller is utilised to regulate the robot's balance. Gyroscopes have a significant role to play in the stability of two-wheeled vehicles. Angles provided by the gyro sensors are used to calculate this change. Due to the motor's low capacity, pulse width modulation (PWM) is used as the control signal.

To give the PID controller information about the angular position of the self-balancing hover's base with regard to its stable vertical axis, a gyro chip is required. The Arduino, which uses a PID controller, has an algorithm for the self-balancing of the hover.

II. PROPOSED WORK

In this project serial communication is how HC 05 functions. When a button is clicked on the Android app, serial data is intended to be sent to the Arduino Bluetooth module. The data is received and sent to the Arduino through the Bluetooth module's TX pin by the Arduino Bluetooth module at the other end. The received data is compared and checked by the code that was uploaded to the Arduino. In the event that the data received is 1, the hoverboard will advance. The Hoverboard will travel backwards if the received data is 2, for example. Similarly, 3 and 4 denote left and right turns, respectively. The maximum current that one Arduino output pin should deliver is 20 mA.

The majority of electric motors require far more current than what one Arduino pin can deliver. The amount of current used by a small, inexpensive electric motor, such those found in toys, may be as little as 0.5A. When a motor starts running or when something holds the motor shaft firmly enough to halt it, the motor draws the highest current. Thus, verify a motor's voltage and current ratings for the running and stall currents. The motors, bearings, driving wheels, swivel wheel, and springs are attached onto the footplate after performing the necessary machining processes. A handle constructed of PVC pipes is attached to the top of the footplate by utilising T couplings once the components have been mounted beneath the foot plate. The assembly of the Segway is seen in the picture following the creation of the circuit wiring and the connection of the electronics. The segway is powered by two rechargeable lead acid batteries with a capacity of 10AH each and a voltage of 12V connected in series.

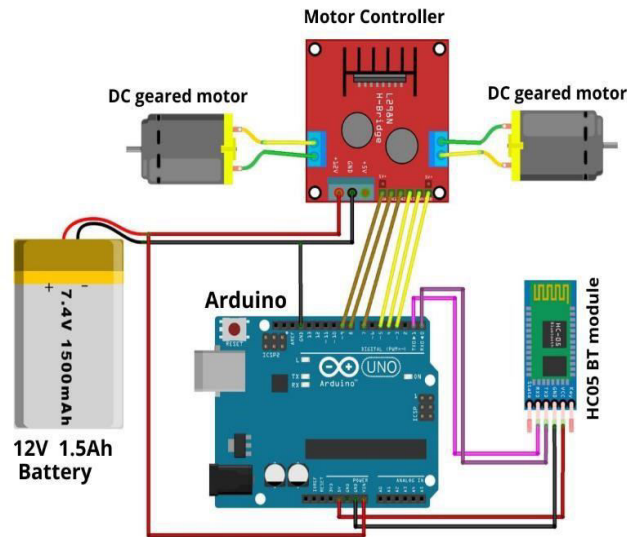


Fig:1-Block Diagram of Proposed System

III. CONCLUSIONS

The project started by investigating design concepts motivated by comparable products on the market. The decision was made to use a rectangular platform with two motorised wheels and two casters. components were bought, linked, and the

A device was created and examined. The main advancement is that it is an emission-free, environmentally friendly vehicle that can eventually take the place of cars to maintain a clean and safe environment. Companies making hoverboards are developing models with longer batteries. The present hoverboard already has this issue, and adding Internet capability will just make it worse. In the next two years, hoverboard manufacturers will focus on a select few qualities, with extended battery life being the most crucial.

REFERENCES

- [1] M. Karthick, K.S. Praveen Kumar, Pranish Nikile, C.V, Ramya. "Electric Hover Board" 2020 IEEE PES/IAS PowerAfrica.
- [2] Supantha Mandal¹, Suraj Kumar Saw², Shilpi Maji³, Vivek Das⁴, Sravanth kumar Ramakuri⁵, Sanjay kumar⁶, LOW COST ARDUINO WIFI BLUETOOTH INTEGRATED PATH FOLLOWING ROBOTIC VEHICLE WITH WIRELESS GUI REMOTE CONTROL, International Conference On Information Communication And Embedded System(ICICES 2016)
- [3] Noli Mark A. Paala, Nikko Marc M. Garcia, Rojimar A. Supetran, Ma. Erica Lyn B. Fontamillas, Android Controlled Lawn Mower Using Bluetooth and WIFI Connection, 2019 IEEE 4th International Conference on Computer and Communication Systems
- [4] B.S. Lakshmi Prasad *, R. Lovaraju, R. Saikoti, G.N.V.P.Kumar, K.Saikumar, G.Rahul, DESIGN ANALYSIS AND FABRICATION OF THREE WHEEL SEGWAY, Mukt Shabd Journal, ISSN NO : 2347-3150
- [5] 1 Vishakha Vijay Patel, 2 Merlyn Mary Thomas, 3 Nitha Prasad, 4 Keshava Raaju, 5 Sreelakshmi C S, 6 Chitralakha G, Self-Balancing Hover Integrating the Concept of Regenerative Braking and Gyroscopic Action, International Journal of Engineering Research & Technology (IJERT)



INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 8.423



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

9940 572 462 6381 907 438 ijirset@gmail.com



www.ijirset.com

Scan to save the contact details