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"SHUI: SMART HOVERBOARD USING IOT"

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SHUI: SMART HOVER BOARD USING IOT

1. Introduction:

Hover boards are boards used by individuals for transportation, as a form of sport and joy. These are boards used by Adults as well as Children. Hover boards were first described by author M. K. Joseph in a 1967 science fiction novel. In 1984, a hover board appeared in the shoot them up arcade video game *SWAT*, developed by Core land and distributed by Sega in Japan and Bally Midway in North America.

The hover board was popularized by the Back to the Future film franchise, with its appearance in Back to the Future Part II (1989). During the 1990s there were rumors, fueled by the film's director Robert Zemeckis, that hover boards were in fact real, but not marketed because they were deemed too dangerous by parents' groups. These rumors have been conclusively debunked.

Hover boards were further developed into self balanced hover boards self-balancing personal transporter consisting of two motorized wheels connected to a pair of articulated pads on which the rider places their feet. The rider controls the speed by leaning forward or backward, and direction of travel by twisting the pads.

These boards are used by children and adults above the age of 8 in order to make transportation easier but these have one major drawback, these boards are not designed for Blind Children and Blind people. Since these make transportation easier, these can also be used by Blind people and children to improve their navigation facility and make things easier for them.

2. Objective:

Hover boards are levitating boards used for personal transportation and also as a medium of sport in children as well as adults. These are self balanced and can be used by individuals above the age of 8 years. But these hover boards are limited by use for the blind people. Thus we aim to achieve Hover boards for blind people, especially Blind Children.

We aim on constructing Hover boards with object repulsion and guiding for blind people and aim to achieve at a lower cost. We are aiming at the implementation of Arduino to control the Speed of the motorized wheels.

By the assistance of Ultrasonic sensors and Cameras we can detect the obstacles occurring in the way of navigation and thus help the consumers commute without any obstacles. In this project, we aim to improve the facilities provided to the blind by implementing IOT and to also make them included in the general usage of gadgets and help them in normalizing their life further on.

3. Literature Survey:

1. Electric Hover board with Handle:

Authors: Akshay Shivaji Khade, Hinduraj Subodh Wadekar, Adwait Ravindra Kamble and Shubham Mangesh Sakpal Mr. J.K.

Hover board is a self-balancing personal transporter consisting of two motorized wheels with a typical gyroscopic- (made steady/made firm and strong) system. (things sent out or given off) from (burning something inside) vehicles are on the rise every day. City-based cars and trucks has increased hugely over the years. Traffic jam leads to higher vehicle (things sent out or given off) and lower (existing all around you/quiet and relaxing) air quality. There can be no immediate solution to this issue, but another solution for ordinary personal transport is Hover board. So the hover boards are becoming more popular day by day. But the complex electronics like acceleration- measuring device and gyroscope make it too expensive. This project involves the design, analysis, and lie/construction of an electric three-wheeled hovercraft. The system moves back and forth using the DPDT switch. A small wheel is used to balance the vehicle such that a gyroscope is not needed for balancing purposes. This project work aims to build a low-cost and (producing a lot with very little waste) Hover board.

2. Design and Control of Two-wheeled Self-Balancing Robot using Arduino: Authors: Anmol Singh Shekhawat and Yogesh Rohilla

This paper discusses the design, construction, and control of a two-wheel study level, small self-balancing robot using Arduino Nano. The system consists of Arduino Nano microcontroller board, DC stepper motor, gyroscope, and accelerometer sensor.

A detailed description of constituting materials in making the robot has been provided. Flow chart and closed loop control diagrams have been given for understanding the controlling of the robot. A step-by-step process of connecting the hardware components has been listed, and finally, hardware assembly is shown. In today's world, we see Segway or Hover board in movies, TV shows, YouTube videos, and in similar video platforms.

A self-balancing robot is an inverted pendulum that swings around a point (centre). It has a centre of gravity (COG) below the centre point, which makes it unstable. By balancing this unstable inverted pendulum, a self-balance robot can be made which can stand still. Inverted pendulum based devices can be used in many applications, such as automated transportation, Segway, and Rockets and missiles. Segway is a two-wheeled, personalized and simple robot that can handle the weight of single person suitably and used for short distance outdoor transportation, indoor transportation, in tourism, and medical purposes. Rockets and missiles are also lifted.

This paper provides the design, construction, and control of a study-level, two-wheeled, small self-balancing robot. It is based on the principle of an inverted pendulum and is designed to reach a specific target and maintain a certain angle. It uses MATLAB for simulation, fuzzy algorithm for controlling it, complex mathematical modelling approach, and control system concepts for controlling the robot. The proposed robot is powered by an Arduino Nano microcontroller board.

3. Designing an Ultrasonic Sensor Stick Prototype for Blind People:

Authors: Sularso Budilaksono

Medium that can go through (twist/bend/change the shape) or elastic medium. Examples of these waves are sound waves (sound qualities), waves on the surface of the water and waves on the rope. Non-mechanical waves or (related to electricity producing magnetic fields) waves.

This wave does not need a medium because it can spread in a vacuum. Changes caused are not mechanical changes. Examples of (related to electricity producing magnetic fields) waves are microwaves, infrared waves and visible light system is the SDLC (System Development Life Cycle) method. System Development Life Cycle (SDLC) is the process of creating and changing systems and the models and ways of doing things used to develop a computer program.

SDLC is also a pattern taken to develop software, which consists of the following steps: Planning: In the planning phase, things that are related to studies of needs, (investigations to see if something can be done), both technically and (related to computers and science), and scheduling are also carried out in this study. In the analysis phase direct (instance of watching, noticing, or making a statement) is carried out by looking at the problems that come up and are (understood/made real/achieved) (related to/looking at/thinking about) the parts/pieces and software and hardware.

Design: At this stage the computer program will be described in detail about the design process of each part in the early model according to the needs in the early model discussed earlier. Putting into use: At this stage putting into use is carried out from the system planning to the real situation that is by selecting the parts/pieces to be used and the preparation of the software (coding / coding). Testing: At this stage testing is carried out to see whether the system created is (going along with/obeying) the needs of the user or not, if not, the next process is repeating/repetitive, (in other words) returning to the previous stages. And the purpose of the test itself is to eliminate or (make something as small as possible/treat something important as unimportant) defects so that the system developed will really help the users when they carry out their activities.

Maintenance: At this stage the process of operating the system begins and if necessary small repairs can be done. Discussion This early model is made using a C programming language which is a language that is often used in making microcontroller programs. This tool works based on instructions or commands that are in the program that are inserted into the microcontroller. The sensor works as an input or input and will be processed in Arduino when the wireless sensor detects an object / (thing that blocks or stops) around it, then outputs sound output through the sound jack connected to the headphone.

A scientific circuit is made to make it easier to make tools. The scientific consists of Arduino Uno, Battery, Ultrasonic Sensor, TRRS 3.5mm Sound, and LM2596 (device that controls something/group of people that ensures rules are followed) module. This research has produced a design early model of sticks for blind people using sensor technology to help the complete awakeness and awareness and movement of the blind who can detect objects at a minimum distance of 7 centimeters with output in the form of sound and vibration. The resulting stick has a frame consisting of 0.5-inch PVC material consisting of two parts, the stick rod and the sensor unit.

4. Fabrication of Hover board- A Personal Electric Vehicle for low distance transportation:
Authors: Shaik Ashraf, J Jeevan, ARakesh, G Yashwanth, M Vivek and B Sudhakar

Hover board is a self-balancing personal transporter consisting of two motorized wheels with a typical gyroscopic- (made steady/made firm and strong) system. (things sent out or given off) from (burning something inside) vehicles are on the rise every day. City-based cars and trucks has increased hugely over the years. Traffic jam leads to higher vehicle (things sent out or given off) and lower (existing all around you/quiet and relaxing) air quality. There can be no immediate solution to this issue, but another solution for ordinary personal transport is Hover board. So the hover boards are becoming more popular day by day. But the complex electronics like acceleration- measuring device and gyroscope make it too expensive.

This project involves the design, analysis, and lie/construction of an electric three-wheeled hovercraft. The system moves back and forward using the DPDT switch. A small wheel is used to balance the vehicle such that a gyroscope is not needed for balancing purposes. This project work aims to build a low-cost and (producing a lot with very little waste) Hover board. Keywords--self-balancing, DPDT Switch, pollution is a major (related to surrounding conditions or the health of the Earth) problem in cities where most people are exposed to poor air quality. Fast (growth of cities with more people) in India has led to significant growth in the number of ICE vehicles. As vehicle traffic continues to grow and crowding and blockage increases, vehicles have become the first (or most important) source of air pollution in city-based India.

The country has taken (more than two, but not a lot of) measures to improve its quality in cities. These include improving fuel quality, drafting the necessary laws (and law making) and applying vehicle emission standards, improving traffic planning and management, etc. Shortage of (coal, natural gas, oil, etc.) and the (act of something getting bigger, wider, etc.) of pollution and fuel rate makes electric vehicles (EV) more popular on transportation.

Compact electric vehicles are gaining some attention from the city-based public, personal transporters include all types of bicycles, Segway, hover board, e - scooter, e-bikes, etc... are widely used. But the main disadvantage of these electric vehicles is their high cost. A Hover board with 3 wheels, which is powered by two engines mounted as part of the Hover board. The DPDT switches control the board's direction and movement. The vehicle has battery-operated electric motors. It is balanced through a small bearing wheel. No micro-controller, gyroscope, or sensor is used. The rider speeds up or slowdowns by using Speed governor.

5.SMART BLIND STICK CONNECTED SYSTEM USING ARDUINO

Authors: G. SRINIVAS, G.M. RAJU, D. RAMESH and S. SIVARAM

In this study, the method and methods used to design and construct an electric hover board are discussed. A hover board is a self-balancing mobile transporter with two powered wheels and a gyroscopic stabilising (machine/method/way). (burning something inside) vehicle (things sent out or given off) are increasing every day. The amount of traffic in cities has increased very much over time. Traffic jam results in increased car (things sent out or given off) and poorer air quality. Although there is no quick answer to this problem, another option for traditional personal transportation is the hover board.

As a result, hover boards are gaining in (quality of being liked a lot or done a lot). However, complicated electronics, such as the acceleration-measuring device and gyroscope, make it way, way too expensive. The design, analysis, and manufacture of an electric three-wheeled hovercraft are all part of this project. The speed can be controlled by a potentiometer and moves back and forth using a DPDT switch.

A small wheel is used to balance the vehicle, eliminating the needed thing for a gyroscope. The purpose of this research is to develop a hover board that is both inexpensive and (producing a lot with very little waste). In cities, where most people are exposed to poor air quality, air pollution is a serious (related to surrounding conditions or the health of the Earth) issue. The number of ICE vehicles in the world has increased very much due to fast urbanization. Vehicles have come out as the most in control/most common cause of air pollution in city-based areas as traffic continues to grow and crowding and blockage worsens. (more than two, but not a lot of) steps have been done by the governments to improve city quality. These include things like improving fuel quality, developing and putting into use (clearly connected or related) laws (and law making), improving traffic planning and management, and so on.

The main idea behind a hover board is to produce a means of transportation that is in contact with the ground. However, the first idea was to build a hover board that does not touch the ground. (float/stay close) board will be powered by rechargeable electrical storage devices, much like any other vehicle. And, in most cases, electricity to charge the electrical storage devices is easily available. The parts/pieces necessary, how each part works, the way of doing things, and finally a discussion of how the (float/stay close) board would work are all discussed in this paper. An end/end result is given as to what we have completed and what more can be done in this area.

6. Design and Theory for Creating Hover Board:

Authors: Praneet Sah, Department of Science, Bedi International School, Bareilly, India

Parts/pieces There are two well-known/obvious things that we want to sustain throughout the (float/stay close) board. Firstly, the whole system needs to run on such a fuel that is (able to be done) to get and secondly, it needs to be portable by being as light as possible. Most of the weight adds up by the use of pressure (strong container) and the electrical storage device which is responsible to power up heating coils, however the pressure created is enough to lift those two (compared to something else) heavy parts/pieces plus the weight of an average human, riding the board.

The extremely important parts/pieces involved are listed as following with their lowest possible (detailed description of exactly what is required). Tube-like pressure (strong container) with semi-elliptical ends The pressure (strong container) is the well-known/obvious part for the whole system. The water is kept inside it and later heated to convert into pressurized steam.

Since we are dealing with pressurized steam, therefore the pressure (strong container) must be able to survive a pressure of at least 6000 PSI. The (strong container) will also have nozzles four pressure relief valves (nozzles) attached to them which automatically get activated as soon as the internal pressure hits 2575 PSI. The volume of the (strong container) is kept in accordance to the space available under the deck of the skateboard and it turns out that 0.2 m3 is the most effective. this pressure against the surface will lead you to a (floating or hovering) (float/stay close) board that can be controlled, if you could. (float/stay close) boards have already been hyped a lot and the only type of board that we didn't have in the market was the one that could work on actual streets, rather than just specially built metallic skate parks. With this explanation (of why something works or happens the way it does), we can be seeing our own (float/stay close) board in less than ten years or maybe a lot earlier.

7. Design and analysis of single wheel hover-board

Authors: Narendran S., Vishal Sampath and Akarsh N. P:

The project required survey and learning exposure to some related projects. The following projects were referred. (a) Two-Wheeled Balancing Robot Controller Designed Using PID: In this paper, the use of PID Controller with IMU Sensor for an elevated wheeled-platform was justified. The paper deals with counteracting with effect of gravity on the platform. The PID Controller was deployed to sense the inclination of the platform against the ground level, and compute control variables for counteract the fall with providing sufficient counter-torque, so that the platform stays parallel with respect to ground. (b) Speed Control of D.C. Motor Using Chopper: The use of chopper drive was observed in the paper. The performance of the four quadrant chopper drive is observed, which concludes the effectiveness of the driver for closed loop operation.

The operations motoring and braking anointed in the paper increases the likelihood of the deployment of the Four-Quadrant-Chopper drive for the overall drive purpose of the DC Motor. Design and Development of a Prototype Super-Capacitor Powered Electric Bicycle.

The use of PMDC motor for traction purpose, instead of the traditional BLDC motor is justified in this paper. The paper deals of equipping a bicycle with a PMDC Motor and Super-Capacitors for long-distance commute. The motor driver exhibits regenerative braking, which is a significant feature of our project.

8. SMART BLIND STICK

Authors: Pratik N K, Poornesh V, Shashikant, Shreedhar Kudva and Saritha a N:

Smart Stick for the Blind a complete solution to reach the destination. This system uses IR sensor, Ultrasound sensor and water sensor to detect the obstacle. However, this system just gives an alert if any one of the sensor is triggered, it uses a buzzer to alert the blind person. This system does not use any location identifier or location indicator. Paper. Pothole detection for visually impaired which uses a camera that captures image 15 frame per second and based on the concept of image processing the pothole is detected. Problem with this system is use of camera makes it expensive, and also a lot of images captured per second increases overhead and storage requirement. Paper. Smart Walking Stick for Blind describes about a Stick which use Raspberry Pi and an ultrasonic sensor to detect objects and intruder, the system also has a camera embedded with it, and based on the images captured the objects are detected. The objects are analysed based on the set of image datasets that are already stored. This system however, becomes costly due to the use of high-end camera and also because of storage constraints as large volume of datasets are needed to be stored.

This system, sometimes might also be inaccurate because the obstacles are detected based on dataset (large set of images) as different objects vary in their shape and size. Smart Belt for Blind uses a belt embedded with ultrasound sensor which detects the obstacle. The belt also has a buzzer which vibrates when obstacle is detected.

The entire system is developed in such a way that the distance calculated is sent as an audio message for the blind person, where in which he hears the distance calculated using a speaker.

A wearable ultrasonic obstacle sensor for visually impaired. This system uses a couple of ultrasound sensor on either side over the strap of the goggles. This project can detect the intruder in front of the blind person who is wearing the goggles. This system is not robust as the sensor embedded with the goggles makes it heavier and also it cannot detect complex objects such as water, vehicle etc.

9.ELECTRIC HOVERBOARD

Authors: Athira. A J, Lukman U Hakeem, Rejna.J and Praveena Krishna. L:

Balancing personal transporter consisting of two motorized wheels with (things sent out or given off) from (burning something inside) vehicles are on the rise every day. a typical gyroscopic Urban cars and trucks has increased hugely over the years. Traffic jam leads to higher vehicle (things sent out or given off) and lower (existing all around you/quiet and relaxing) air quality. no immediate solution to this issue, but another solution for ordinary personal transport is Hover board.

There can be So the hover boards are becoming more popular yes by day. But the complex electronics like acceleration-measuring device and gyroscope make it too expensive This project involves the design, analysis, and lie/construction of an electric three wheeled hovercrafts. The system moves back and forth using the DPDT switch. purposes. The small wheel is used to balance the vehicle such that a gyroscope is not needed for balancing is project work aims to build a low Keywords -- self-- cost balancing, DPDT Switch, low cost.

Air pollution is a major (related to surrounding conditions or the health of the Earth) problem in cities where most people are exposed to poor air quality. (growth of cities with more people) in India has led to significant growth in the number of ICE vehicles. As vehicle traffic continues to grow and crowding and blockage increases, vehicles have become the first (or most important) source of air pollution in city-based India measures to improve its quality in cities.

These include improving fuel quality, drafting the necessary laws (and law making) and applying vehicle emission standards, improving traffic planning and management, etc. Shortage of (coal, natural gas, oil, etc.) and the (act of something getting bigger, wider, etc.) of pollute transportation. Compact electric vehicles are gaining some attention from the city-based public types of bicycles, Segway, hover board, e scooter, ebikes, etc... are widely used. But the main disadvantage of these electric vehicles is their high cost. A Hover board with 3 wheels, which is powered by two engines mounted as part of the Hover board.

10. Hover board with Handle Segway:

Authors: Tejas Arun Bagul, Raj Pramod Patil, Siddhant Ravindra Karanjkar, Tejas Narayan Kandekar, Prof. P. K. Sonawane

The current transportation city-based ability to move around model has negative impression on the (community of people/all good people in the world) such as sicknesses due to air pollution, road (sudden unplanned bad events/crashes), climate warming, crowding and blockage and dependence on fuel sources available which are limited.

About three million people in the world die every year because of sicknesses caused due to pollution. Children are the main victims of sicknesses related to pollution. Forty percent of sicknesses caused by (the health of the Earth/the surrounding conditions) affect children under five, whereas these children make up only 10% of the world's population.

According to the World Health Organization 40% of the planets pollution (that heats up the Earth) (things sent out or given off) was due to car in the year 2010.Between the year 1950 to 1990, the number of motor vehicles in the world had multiplied to nine times, (in other words) increase from 75 million to 675 million. According to the most conservative projections of the Organization for Money-based Co-operation and Development, there will be 1.62 billion vehicles in 2030. In a dislike (because of mistreatment) search the number of vehicles in Jaipur. India has increased much/a lot in the past five years, resulting in increase in pollution too.

According to (related to a large area) transport office, every day 500 new non-commercial vehicles get registered including two wheelers and four wheelers. In the (not very long ago) press released of the WHO report on pollution in India, the present situation of the city is not so encouraging when pollution in the air comes to picture. Due to increase in number of vehicles over the years, the city roads witness frequent traffic jams, but above all, the vehicles sending out (things that dirty the air, oceans, etc.) are affecting (surrounding conditions) badly.

"The air pollution consists of many (things that dirty the air, oceans, etc.), among other (related to tiny particles of dust, etc.) matter. These particles can penetrate deeply into the breathing and lung related area (of land) and therefore make up/be equal to a risk for health by increasing death from breathing and lung related infections and sicknesses, lung cancer, and selected disease of the heart and blood vessels," says the WHO report.

11. Towards an Electric-Powered Air-Gliding Skateboard:

Authors: Qing Shan, Jason L. Yang. S. Chan, Ganglia Zhang, and Wen J. Li.

This paper presents the development of a novel air-gliding (hovering) "skateboard" (or "skim-board") based on an aerodynamic principle that distributes airflow uniformly between the board and a flat surface. Experiments were conducted to understand the aerodynamic principle and characterize the performance of the system. Several prototypes of the hovering system have been built, and it is possible for a board with a surface area of ~1mx0.3m (weighing ~5Kg) to glide in air with a rider of ~50Kg on top of it.

Besides the obvious fun application of using this board as a skateboard that requires no wheels, another example of applications is to use it as an 'air- skimming' board. The 'air-skimming' board concept is similar to skim-boarding on a thin-sheet of water and is popular with young adults in many parts of the world. Inspired by the "hovering skateboard" from 1989, a group is developing an air-gliding transport system to make this dream come true for many kids and adults across the world.

Recent advances in technology have made it possible to mechatronic ally integrate a battery- powered hovering system that is capable of carrying the weight of an average adult and allowing a rider to be transported in a thin "air-bearing" above the ground. The technologies that will enable the eventual mass-market development of this air-gliding board include powerful electrically driven motors, new energy-storage systems, MEMS sensors that are light weight and small enough to be embedded in a hovering system to provide critical feedback information to the motor, which would then be controlled to give more efficient and stable aerodynamic lift.

The hovering system developed by our group is referred to as a "Hover board" and is widely used to describe the hovering skateboard that appeared in Back to the Future Part II. Hover board enthusiasts from all over the world are attempting to achieve their dream of gliding on air through different approaches. Two existing successful air-gliding systems are the Air board developed by Arbortech Company and the homemade DIY hover boards.

12. Quadrotor hover board

Authors: K. Siddhardha1 and Joel G. Manathara:

This paper proposes a control scheme that uses the center of gravity (CoG)variation caused by the tilt of the pilot standing on a quadrotor to maneuver it in the horizontal plane. It designs controllers for two modes of operation: a) Maneuver via leaning mode, and b) Remote control mode, which rejects all disturbances including the pilot's movements and maintains the desired speed and turn commands provided by the pilot using a hand-held remote control. The simulation results show that it is possible to control the quadrotor motion using CoG shifts caused by a pilot with moderate skills.

The 1989 film Back to the Future II popularized the concept of a hover board, and there have been sporadic instances of demonstration of flying in indigenous devices that function similar to a hover board. The one that is close to the original concept is Za-pata fly board air, which uses four small jet engines to produce the desired thrust to lift off with a pilot standing on-board.

Thrust vectoring using jet deflectors at the exhaust of the engines along with the thrust from two additional small jet engines mounted in the forward direction allows fly board air to be controlled, but it requires extreme skills to fly as the pilot has to simultaneously carryout multiple tasks. To make the piloting task of a hover-board like fly board air easier, this paper invests in a hand-held remote control.

Joel G. Manathara is an assistant professor with the Department of Aerospace Engineering, IIT Madras, Chennai 600 036, India. He is developing a controller that will enable a pilot to stand and ride on a hover board by simple body movements such as tilting. A significant concern for a hover board is the choice of the power plant, as jet engines provide adequate thrust and endurance, but the temperature of the exhaust gases and the high noise produced by the high noise limit its use in urban environments. Electric motors like brushless DC motors do not have these drawbacks, but the present battery technology limits the endurance of hovering aerial vehicles with electric power plants to a few minutes. The use of Internal Combustion (IC)engines will substantially increase the endurance of these aerial vehicles.

13. Design and Implementation of Smart Blind Stick:

Authors: Shubham Belea, Swapnil Ghuleb, Akshay Gunjalc, N.D. Anwatd

The International Conference on Communication and Information Processing (ICCIP-2020) has published a paper on the design and implementation of a Smart Blind Stick. The paper aims to contribute knowledge and services to the people of blind and disable society by providing more convenient means of life.

Blindness is a state of lacking the visual perception due to physiological or neurological factors, while partial blindness is the lack of integration in the growth of the optic nerve or visual center of the eye and total blindness is the full absence of the visual light perception. The electronic walking stick will help the blind person by providing them with a more convenient way to reach their destination.

The paper is based on the research of Shubham Bele, Swapnil Ghule, Akshay Gunjal, and N.D. Anwat from the Department of Electrical Engineering BSIOTR, Wagholi, Pune-412207, India. The most important details in this text are that white cane is the best friend of visually impaired people, but it is often not useful and restricts their mobility. Total blindness is the complete lack of form and visual light perception and is clinically recorded as NLP, an abbreviation as "no light perception". Those described as having only light perception have no more sight than the ability to tell light from dark and the general direction of a light source. The system has been developed using both the hardware and software implementations.

Shubham Bele et.al. have developed a system for a blind person with an electronic stick. The system consists of two ultrasonic sensors mounted on the stick, two Infrared sensors on the lower side, and a switch that allows the blind user to send a general message. The circuit box contains a combination of GSM300/900 module and microcontroller circuitry, and the co-operation between the Ultrasonic and IR sensors is utilized to create a complementary system that is able to give reliable distance measurement. The ultrasonic sensor is used to detect the presence of obstacle and calculate the distance between the source and destination, while the infrared sensors are used to detect small obstacles ranging from 2-10cms.

14. Review on Smart Stick:

Authors: Arvind Lal, Roshan Acharya, Bal Badhur Sewakoti, Durga Badhur Kami, Binod Niroula and Tseten Namgyal Bhutia

The International Journal of Science and Research (IJSR) has published a review on a Smart Stick with infrared sensor to detect stair cases and ultrasonic sensor to detect any other obstacles in front of the user, within a range of four meters. The stick is equipped with Arduino, stick, voice module, ultrasonic sensor, IR sensor, water sensor, GPS, LDR sensor, and GPS. It is designed to help visually impaired people interact and feel their environment, as they have little contact with surrounding.

It is a cost effective device for visually impaired people, as it can help them move and perform their work easily. The World Health Organization (WHO) estimated that there are 70 million people in the world living with visual impairment, 7 million of which are blind and 63 million with low vision. Physical movement is a challenge for visually impaired persons, as it can be difficult to distinguish where they are and how to get to where they want to go. Over half of legally blind people are unemployed, and rely on their families for mobility and financial support.

Sight is the most important part of human physiology, as 83% of information human beings get from the environment is via sight. The main architecture of our project is based on the Stick, a PVC pipe made with PVC pipe. Arduino (UNO R3) is an open-source hardware and software company that designs and manufactures-board microcontrollers and microcontroller kits for building digital devices and interactive objects. Ultrasonic transducers or ultrasonic sensors (HC-SR04) are a type of acoustic sensor divided into three broad categories: transmitters, receivers and IR sensors (A215/450) can be used to sense the obstacles in our project.

15. Hover board for Personal Transportation:

Authors: A. Dineshkumar, V. Aadhithyan, R. Rajkumar, K. Sanjai and M. Nithi

The available methods for personal ability to move around were learned such as Kick scooter, Segway, (float/stay close) boards, Stand on scooters, Unicycle. There are rules and regulations for them followed in other countries.

- Now the biggest disadvantage of EMCs is their higher price. Higher price could be paid/made up for by lower operational costs.
-The Socio technical change (from one thing to another) proves that the people are changing towards electric personal transporters.
-Many factors like the Information available about people, Health status, Ability to move around habits, Attitudes about Ability to move around scooters, Life quality were studied. Nearly 88% people were found (usual/ commonly and regular/ healthy) with the Ability to move around scooters.

-The (ability to actually be done) of starting it in the market were analyzed.

4.Problem Statement:

Hover boards are gadgets and devices which are used to make transportation easier, we have various developments in Hover boards, like Electronic Hover boards, Self Balanced Hover boards and much more and they are in high use in many places. They also possess certain amount of drawbacks due to which it becomes difficult to use them and they are:

High cost- The main disadvantage of this device is its high cost. Most models are quite expensive, but it is not recommended to choose the simplest model. At Smart Balance, you will find many variously colored models, at a convenient budget for everyone.

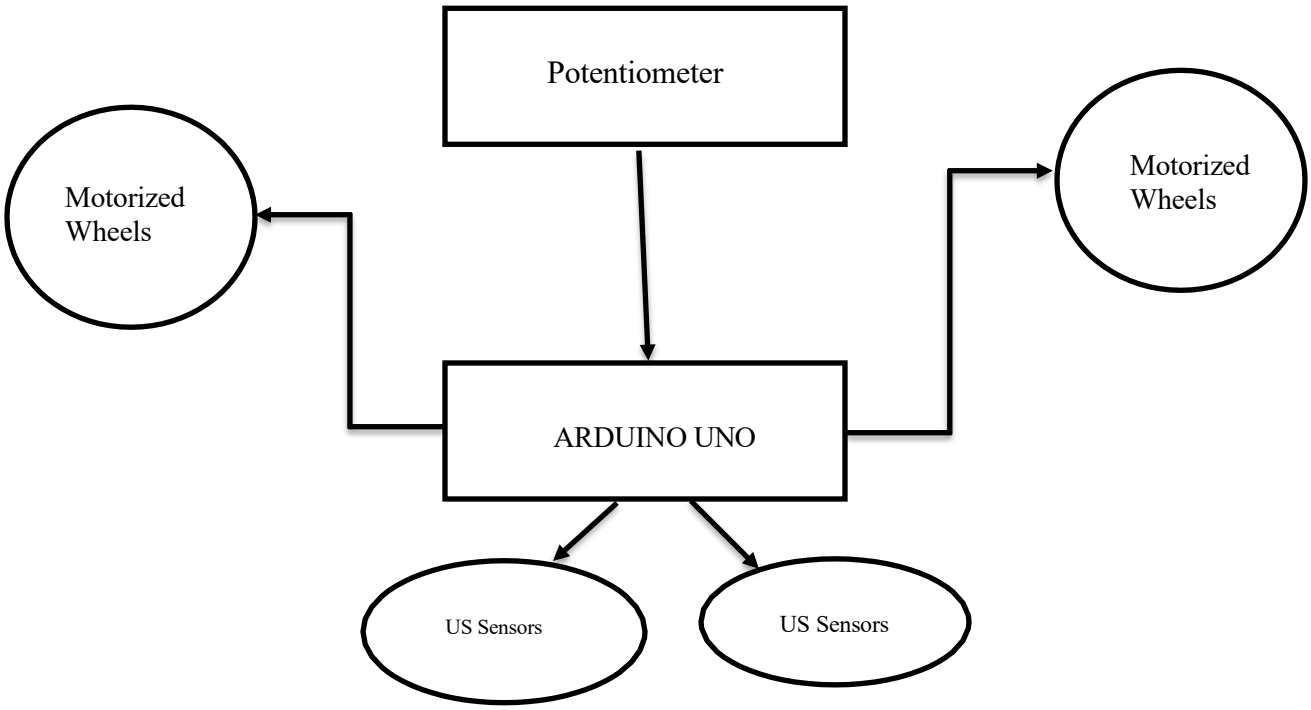
Risk of Accident-Using the hover board requires great care if you are a beginner, to avoid the risk of falls and injuries. It is good to train before going fast, to know how to master the device well.

Overheating Problems-According to many hover board users, this device tends to overheat. This happens when the hover board is equipped with a poor quality battery. However, you can avoid this type of problem by carefully choosing your hover board and reading a few reviews before you buy it. At Smart Balance, you will quickly find a selection of the best models, with Samsung or LG batteries, which will satisfy your requirements.

Restricted use-Despite the advantages of this means of transport, you cannot use it everywhere. There are certain restrictions in parks or also at certain airlines and transport companies. It is best to inquire if access is allowed with this device.

In short, the hover board is light, economical, and practical. However, like all other modes of transport, it can be dangerous and can cause injury. This can be avoided by purchasing a device that meets quality and safety standards and by using complete safety devices: helmet, armrests, knee pads. Finally, don’t forget to consider the maximum load borne by the device.

5. Methodology:



The proposed Hover boards are being controlled by the use of Arduino Uno. Two motorized wheels are being used and thus they are being monitored and controlled by Arduino. The speed of the Hover board is being controlled by the Potentiometer, depending upon the amount of speed required, the potentiometer is adjusted and thus the Arduino is run in that particular speed.

We are indulging the use of Ultrasonic sensors as well as cameras to detect the objects and obstacles in the way of commuting and thus provide the visually impaired with a way of easy commutation.

6. Expected Outcomes:

There is huge amount of Hover boards present in the market and all of them are accessible to the society but are limited to use for the Blind people, thus we expect to design a suitable Hover board for the blind and the visually impaired people, such that they can commute from one place to another easily as well as enjoy the perks and uses of a hover board. We aim to achieve this and provide this relaxation to visually impaired by the implementation of IOT, sensors as well as cameras at an affordable cost.

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