

Survey on “Hand Gesture Controlled Solar Powered Tricycle”

Shikalgar Payal Dastgir
Department of E&TC
AITRC, Vita
Maharashtra ,India
shikalgarpayal@gmail.com

Kumbhar Varsha Ashok
Department of E&TC
AITRC, Vita
Maharashtra ,India
Varshakumbhar3097@gmail.com

Mr.Vikas R. Nichal
Assistance professor
AITRC, Vita.

Kadam Savita Pratap
Department of E&TC
AITRC,Vita
Maharashtra ,India
savitakadam41@gmail.com

Abstract: The percentage of handicap peoples in India as well as in world it's a big problem. But that handicap people can be work efficiently and regular life as all leave. So here in this paper we have survey different technologies and vehicle systems presently available for handicap people. Also we have compared their advantages and disadvantage of the different vehicle systems. From these all previous methods we have collected some points and we are introducing about new vehicle system for handicap person as well as for normal people. Which is based on solar panel and hand gesture based transportation vehicle system for handicap people.

Keywords: solar panel, Motor, Ardiuno, programming language.

I. INTRODUCTION:

Our project review is about tri-cycles which operate on solar energy. Today's time electricity plays vital role in our day to day life. To generate electricity is the main challenge and it's important for human being for living effortless life. To generate electricity solar is the best, easily available, cost free and eco-friendly option. Tri-cycle used by immobilized persons as well as daily workers also. Lots of solar tri-cycles are present in market but those have many disadvantages. Paddling solar tricycle is present at market which requires human effort to drive. It requires man power to drive the cycle. A motorized tricycle requires fuel to drive. Fossil fuels are Non-renewable, costly, combustible source which act as pollutant. Combustion of fossil fuels play important role in pollution which causes global warming. An electric motor cycle requires electricity for operating. As per Fuel electricity is also significant. it is costly. All this information collected by studying of different paper maintained in references. So overcome these disadvantages we are planning to develop a solar tri-cycle which is instructed by hand gesture. As per different gesture of hand it performs different movements E.g. rotate to right or left. Without using any handle left or right movement takes place. This additional feature reduces the efforts of immobilized persons.

II. OBJECTIVES:

Handicapped persons are facing lot of problems and there are various techniques are available for resolving their problems. The technique involves problem like cost, speed etc. So, to develop better technology we have studied various research paper and market survey.

- Prime focus to develop a solar tri-cycle instructed by hand gestures.
- To develop a tricycle that will use renewable energy and ecofriendly.
- To develop a tricycle for longer distance traveling.
- To develop such a tricycle whose directions are instructed by hand gesture.

III. SURVEY OF DIFFERENT TRI-CYCLE SYSTEM

Different types of tri-cycles are present at market.

1. **Paddled Tri-cycle:** The tri-cycle is operating on as same principle of bicycle only hand power is required to drive it. The chain is attached from hand paddle to wheel to drive it[6]. It requires more energy .So, the person get tired after using it. This will affect their working ability. Handicapped persons are largely depends upon other persons. They have less opportunities of adapted road[1]. It is difficult to operate tricycle for handicapped persons.

Before designing of tri-cycle different parameter has to be considered. The height of tri-cycle is very important

parameter. It should be balanced not too much high or not too small. The person should be comfortable. The tri-cycles easy for transportation, compact in size, easy to park. The tri-cycle requires low maintenance. Tri-cycle safe for any person but it requires lot of energy to drive.

2. **Motorize Tri-cycle:** As per name motor tri-cycle are operated on motor with the help of fuels. Fuel powered system improves the efficiency of system Fuel is required for the ignition of engine[6]. A spark ignition system engine are mainly used here which operate on magneto that provides current for the ignition system such as a petrol engine[6]. A chain is attached from shaft of motor to the wheel .if motor starts then motor shaft starts revolving and wheel is start rotating. Chain, sheet, Wheel, shaft, footrest, rims (circular shaft), spokes; sprockets, brakes etc. are some components of tri-cycle[8].

Most important parameter of design of tri-cycle is fuel engine which is connected to the rotating shaft. Fuel powered engine contains mechanical breaking system. Rotating shaft decide the speed of tri-cycle. 75Kg is the maximum capacity of tri-cycle to carry weight of vendor[5]. Motor tri-cycle can cover longer distance within a short period of time. Motor tri-cycles are easy to handle which drive by any person without taking any extra efforts. The prime focus of this technique is to make effortless, good living life of physically immobilized persons.

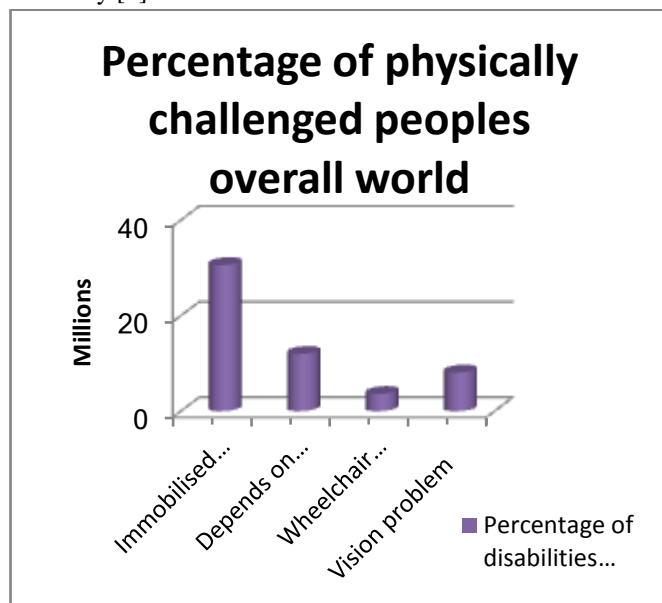
The main advantage of this technique is there no need of paddling to drive the tricycle. The user doesn't require to waste own power to drive the tri-cycle. The main parameter in this technique is fuel which is costly, non-renewable source and combustion of fuel is harmful to the environment. Global warming is very important parameter to consider before designing any technique. The combustible fuel is act as pollutant[4]. This is the main disadvantage of motorized tri-cycles.

3. **Electric Tri-cycle:** In motorize tri-cycle the combustion engine is required for the rotation of motor which causes harm to environment and fuel is non-renewable source. To remove this disadvantage electricity is used to drive the motor. The batteries are used to store electricity. Battery consists of electrochemical cells, which store chemical energy makes it as an electrical form[2]. Power must transmit from electric motor to the wheel of tri-cycle. The capacity of battery is decide how long cycles work. The motor speed and brake is controlled by joystick[5].

Electricity play vital role in day to days life. The generation of electricity is difficult and costly .So this is the main disadvantage is obtained after studied different paper

4. **Hand Gesture controlled wheel chair:** In future the robots are used for each work. All technologies are based on robots. The wheelchair which is operated on human hand gesture is also the one type of robot system. In future the robots can easily communicate with human in natural way. Basically in now day's wheelchair is controlled by using joystick. The cost exceed up to 1,50,000 which is not affordable to every physically disabled person [3]. Mainly wheel chair used by the immobilized persons. The hand gesture recognition is done by MEMS sensors and wheel chair controlled by microcontroller. Peoples those are physically disabled and partially paralyzed have to face mobility problems [2]. They are always depends on other person. They face lot of problem before doing any work due to this self-confidence affected which affect on their willpower.

Firstly, the Hand gestured physical signal should be converted into electrical form and then converted into in digital form. This chair operates on human command so this is human interface machine which perform a different task as per human need[3].Now days fast world doesn't have time to spend that on take care of physically challenged persons. This technique helps them travelling some distance by own self. In India, the percentage of physically disabled persons is increases. In overall world 2 in 10 adults live with disability [1].

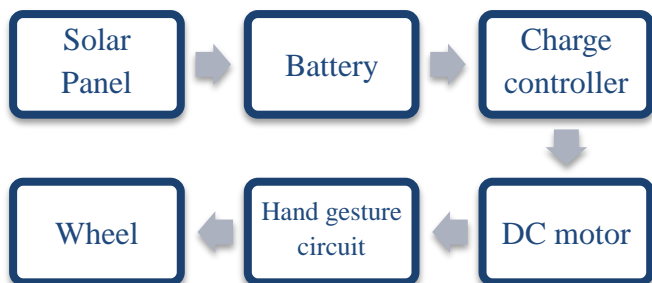


This is the percentage of physical disable persons. The immobilized and wheel chair used ratio is high.

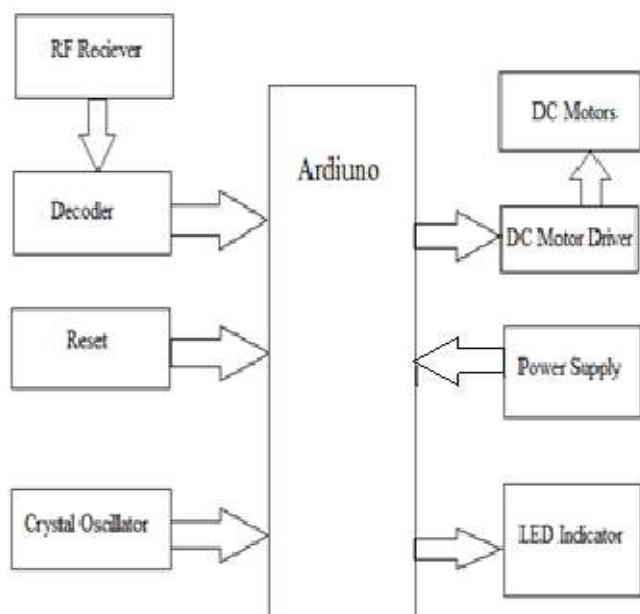
The Wheel chair is used for only short distance travelling. This is the main disadvantage of this technique. Hand gesture recognition technique is very useful to develop new project.

5. Hand Gesture Controlled Solar Tri-cycle: To overcome all these problems we decide to design solar tri-cycle which controlled by hand gesture

Block Diagram:



Hand gesture control section block diagram:



Component Details:

A. Solar Panel: Solar panels consist of solar cells. Solar cell convert the light energy into electricity. Solar cells made by semiconductor material i.e. by silicon material. The solar cells are sandwich of n-type silicon and p-type silicon[5]. Solar cells operates on principle of photovoltaic effect. solar cells are covered by sheet of glass on top. When sunlight shines on the cells, photons bombard the upper surface. The photons carry there down through the cell[4]. Photons give up their energy to electrons in lower p-type layer. Electrons use this energy to jump across the

barrier into the upper, n-type layer and escape out there by generating electricity[5].

B. Hub Motor: Hub Motor is a conventional DC Motor. In DC Motor the rotor is outside stator with permanent magnet mounted inside. When current is supplied to the Motor it generates rotational motion[7]. The Motor generate high torque at low speed they are very reliable and long life[6]. The main characteristic of brushless DC motor is that they may be controlled to give wide constant power speed ranges[5].

C. Battery: There are various types of batteries available in market. Lead-acid battery is the most popular type of battery in electronics[6]. The capacity of battery is measured in Ampere-hours. In tricycle the battery require must have light weight and long life. Lead acid battery is more efficient and practical choice for applications[2].

D. Arduino: Arduino is a microcontroller board which is a small circuit that contains a whole computer on a chip. Arduino consist sets of analog and digital input-output pins. It can be interfaced with other circuits. Most arduino board consists of an Atmel 8-bit AVR microcontroller with varying amount of flash memory pins and features [3]. Arduino is reprogrammable IC board. Different versions of arduino boards are available like arduino uno, arduino pro, Lilypad arduino board etc with various capabilities and features.

These are the some basic information of component.

Conclusion:

By studying of different papers and techniques we decide to make project on Hand gesture controlled solar tricycle which removes different disadvantages.

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Vikas Nichal received the BE degree in Electronics and Tele-communication engineering from Shivaji university, Kolhapur in 2012. He has completed ME in Electronics and Tele-communication engineering from Shivaji university, Kolhapur. His area of specialization in digital signal processing and wireless communication and currently working as an Assistant Professor in AITRC, Vita.

Biography:



Payal Shikalgar pursuing BE E&TC in Adarsh Institute Technology and Research Centre, Vita . Her area of specialization in Network and MATLAB



Varsha Kumbhar pursuing BE E&TC in Adarsh Institute Technology and Research Centre, Vita. Her area of specialization in MATLAB



Savita Kadam pursuing BE E&TC in Adarsh Institute Technology and Research Centre, Vita. Her area of specialization in Digital communication.