



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 5, May 2023

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

 [ijrset@gmail.com](mailto:ijrset@gmail.com)

 [www.ijrset.com](http://www.ijrset.com)

# Demonstration of E-Vehicle with Wheel Chair

<sup>1</sup> L S Prasad, <sup>2</sup>Praveen G B, <sup>3</sup> Abhishek, <sup>4</sup> Adithya T V, <sup>5</sup>Chethan B, <sup>6</sup>Lohith Kumar S, <sup>7</sup>Darshan S, <sup>8</sup> Sachin, <sup>9</sup>Thushan, <sup>10</sup>Yuvaraj M

<sup>1</sup>, Assistant Professor, Dept. of Mechanical Engineering, Yenepoya Institute of Technology, Moodbidri, India

<sup>3,4,5,6</sup>Students, Dept. of Mechanical Engineering, Yenepoya Institute of Technology, Moodbidri, India.

<sup>2</sup>, Assistant Professor, Dept. of Electrical and Electronics Engineering, Yenepoya Institute of Technology, Moodbidri, India

<sup>7,8,9,10</sup>, Students, Dept. of Electrical and Electronics Engineering, Yenepoya Institute of Technology, Moodbidri, India

**ABSTRACT:** The number of handicapped people in India is rising every. Mobility aids are beneficial for patients as a means of transportation and as a substitute for walking, particularly in indoor and outdoor environments. Problems faced by those with physical disabilities and necessary changes to utility features for people's betterment. The generation of power is a big difficulty for the world, and the problem for the 1.3 billion physically challenged individuals is made worse by rising population and power shortages. India has around a million people. Improved mobility is currently a significant concern in the public healthcare sector, particularly for elderly and handicapped people who live alone. As a result, the need for support devices like smart wheelchairs has significantly expanded within the healthcare sector, particularly for patients who are unable to walk normally due to an accident. By implementing specialised interfaces that allow users to emit commands that are detectable and understood by machines, human-machine interaction researchers are now able to increase the capabilities of traditional wheelchairs.

**KEYWORDS**—Electric car, Wheelchair, Solarpanels.

## I. INTRODUCTION

Physical impairment can make it difficult to move around on one's own and do everyday duties, such as travelling to work or school. There are presently more than 1 billion disabled persons in the globe who struggle with daily tasks as a result of accidents, illnesses, birth deformities, and wounds sustained in combat. The World Health Organization (WHO) defines a handicapped person as someone who experiences challenges carrying out activities or actions, has limits in physical function or structure, and is restricted in their ability to participate.

People with physical impairments still have trouble getting transportation that meets their unique requirements, despite advances in technology and transportation. Many physically challenged people dream of being able to drive or ride in automobiles, but this is sometimes a struggle.

According to a government study at the national level, there are roughly 27 million differently abled persons in India, or 2.21% of the total population. 14.98 million of them were male, and 11.84 million were female. In comparison to metropolitan regions, rural areas have a larger number of handicapped persons. Mobility impairments were the most prevalent form of disability, impacting 5.43 million persons.

We have created and developed a mechanism to convert leg-operated cars to hand-operated models in response to this problem. Our concept is designed for persons whose legs are hurt or crippled and who depend on their hands for daily tasks like long-distance travel. Our goal is to create a cheap, tough vehicle that can be used in a developing nation like India. In order to do this, we created the car using components and factories that are easily accessible locally.

In this research, we investigate the viability of creating an electric car from a known, locally accessible platform. By enabling individuals to move more freely and independently, the conversion of leg-operated vehicles to hand-operated models has the potential to significantly improve the lives of persons with physical limitations.

With the support of this initiative, persons with physical impairments will be able to fill the vacuum in the transportation industry and realise their aspirations of being independent and mobile.

## II. LITERATURE SURVEY

Eco-driving is a term used to refer to a strategy for operating vehicles so as to minimize energy consumption. Without any hardware changes, eco-driving is an effective approach to improving vehicle efficiency by optimizing driving behaviour, particularly for autonomous vehicles. [1]

The environmental concerns and reduction in fossil fuels have become a major concern due to which a large number of electric and hybrid vehicles are being built to minimize the contribution of greenhouse gas emissions from the transportation sector and to increase the efficiency of the overall vehicles. Electric vehicles (EVs) play an important role in today's development of smarter cities and hence, there is a rapid growth of EVs all around the globe. [2]

Implementation of lighter and smaller power sources requires the estimation of power demand under different driving conditions, which are not available for portable assistive technology such as electric or power wheelchairs. [3]

A project for upgrading conventional cars to hybrid electric vehicles is presented. Hybridisation to a through the road parallel hybrid structure is obtained by integration of wheel motors in rear wheels, the addition of an additional battery, of flexible photovoltaic panels and a Vehicle Management Unit. [4]

In this paper, they have highlighted that there is practical as well as symbolic dimensions that are important for BEV adoption. Their interviewees perceived their BEV as being more comfortable than petrol or diesel cars. All BEV owners in the interview study (except the one driving a Buddy model) highlighted great driving characteristics and also considered their BEV to be a safe, silent and exciting technology. [5]

## III. PROBLEM STATEMENT

1. The amount of energy consumption currently serves as a proxy for progress in all societies. Therefore, it is acknowledged that energy is a crucial input parameter for the growth of the national economy.
2. Physically disabled persons have a problem that has to be solved, as does the demand for utility and technological advancement.
3. Utilising renewable energy can help ease the strain of producing energy from non-renewable sources.
4. Patients with paralysis.

## IV. MODEL DESCRIPTION

A vehicle class known as an electric vehicle (EV) uses electricity as its primary fuel rather than petrol or diesel. An electric motor drives the wheels of the car using electricity that is stored in a battery. Electric cars come in a variety of forms, such as hybrid electric vehicles (HEVs), which combine an internal combustion engine with an electric motor, and all-electric vehicles (EVs), which are powered only by electricity.

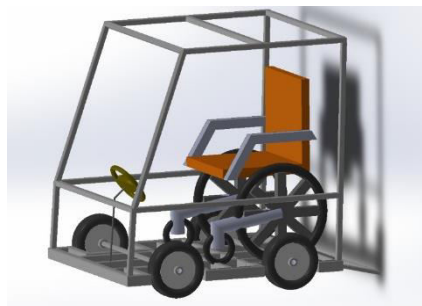


Fig 1 Skeleton Model

The fact that electric vehicles emit no emissions makes them a more ecologically friendly choice than conventional petrol or diesel vehicles. This is one of their key advantages. Due to the fact that electricity is typically less expensive than petrol or diesel, they also typically have lower operational expenses than conventional cars. A more enjoyable driving experience may result from the fact that electric vehicles are frequently quieter than conventional automobiles.

The act of modifying and adapting a wheelchair to best suit the requirements and preferences of the specific user is known as wheelchair optimisation. This may entail altering the wheelchair's seat, backrest, footrest, armrests, and other parts.

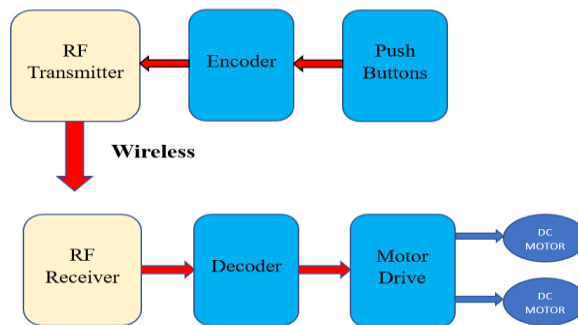


Fig 2 Block Diagram of Remote-Control System

## V. COMPONENTS USED

The durability, effectiveness, and compatibility of the components used in the design and construction of a Smart E car with wheelchair system employing solar panels should be taken into consideration.

### Frame /Chassis:

The essential framework of every vehicle is referred to as the chassis. It serves as the hub to which all other parts are connected

### 20000Rpm Gear Motor:

A small, compact motor gearbox that is frequently used in prototype cars is the Ouee RS390 Electric Motor Gearbox. Its maximum speed ranges from 12000 to 20000 RPM, and its voltage ranges from 6V to 12V.

### ECM for motor control:

An embedded system that is frequently used in automobiles to regulate the motor is an electronic control module (ECM), also referred to as an electronic control unit (ECU).

### Solar panel charge controller:

In order to provide effective and secure charging of a battery or other load, a solar panel charge controller is an electrical device that regulates the voltage and current output from a solar panel

### Solar panel:

A photovoltaic module called a 12V solar panel is made to produce electricity from sunlight.

### Battery 12v 4AH:

The Exide Xplore 12V 4AH battery is a sealed, maintenance-free lead-acid battery made for a variety of uses, including emergency lighting, motorcycles, scooters, and ATVs.

### Invertor

An appliance that transforms a solar panel's direct current (DC) output into alternating current (AC), which can be used to power residential or business equipment, is a solar panel invertor.

### MAX30102

The MAX30102 is a highly-integrated pulse oximeter and heart-rate sensor module that is designed to provide accurate heart-rate measurements and blood oxygen saturation levels.

### ESP32 MODULE

Espressif Systems created the ESP32, a system-on-chip (SoC) microcontroller with built-in Wi-Fi and Bluetooth functionality

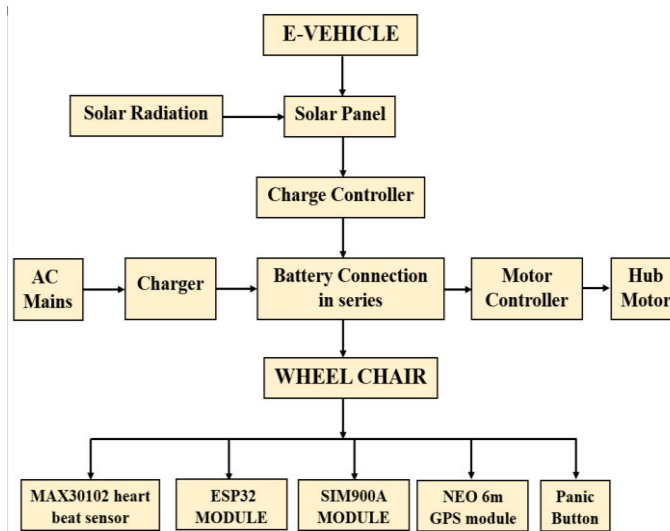
### SIM900A MODULE

SIM900A is a quad-band GSM/GPRS module designed for embedded applications. It is a highly integrated module that combines the power of a microcontroller with the communication capabilities of GSM/GPRS networks.



**NEO 6m GPS module**

A compact, low-power GPS receiver, the NEO-6M GPS module delivers precise position and time data. The NEO-6M GPS module contains an integrated active antenna and a high-sensitivity receiver that enable it to pick up and follow satellite signals even under difficult circumstances.



**Fig 3 Block Diagram of E-Vehicle**

**VI. CONCLUSION**

In conclusion, the creation of a smart wheelchair or e-vehicle has the potential to completely change how people with impairments move about. By fusing the accessibility of a wheelchair with the convenience of a small electric car, this ground-breaking technology gives users more mobility and independence.

The user experience is improved by the incorporation of intelligent features, making driving the car simpler and safer. Examples of these features are obstacle detection and GPS navigation. Additionally, the e-vehicle wheelchair is an environmentally sustainable solution due to the use of eco-friendly materials and effective electric motors.

The smart e-vehicle cum wheelchair represents an important advancement in terms of raising the standard of living for people with impairments. It provides a useful and effective mode of transportation that can improve independence and mobility while lessening the environmental effects of conventional gasoline-powered cars. This technology has the potential to alter the way we think about accessibility and mobility with more study and development.

**REFERENCES**

[1] Heeyun Lee, Kyunghyun Kim, Namwook Kim, Suk Won Cha, “Energy efficient speed planning of electric vehicles for car-following scenario using model-based reinforcement learning”, *Applied Energy*, Volume 313, 1 May 2022

[2] Muhammad Umair Mutarraf, Yajuan Guan, Luona Xu, Chun- Lien Su, Juan C.Vasquez, JosepM.Guerrero, “Electric cars, ships, and their charging infrastructure – A comprehensive review” *Sustainable Energy Technologies and Assessments*, Volume 52, Part B , August 2022

[3] Dafne Zuleima Morgado Ramirez , Lara Rasha, Giulia Barbareschi, Tatsuto Suzuki , Irving Caplan, Iain McKinnon , Dan J.L. Brett , Catherine Holloway, “Adjusted method to calculate an electric wheelchair power cycle: fuel cell implementation example” *Journal of Energy Storage* 2019

[4] Rizzo Gianfranco, Tiano Francesco Antonio, D’Alessio Pietro Maria, Marino Matteo, “A prototype car converted to solar hybrid: project advances and road tests.”, *FAC Papers OnLine*, 2022

[5] Lina Ingeborgrud, Marianne Ryghang, “The role of practical, cognitive and symbolic factors in the successful implementation of battery electric vehicles in Norway” *Transportation Research Part A: Policy and Practice*, Volume 130, December 2019, Pages 507-516



**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](http://www.ijirset.com)

Scan to save the contact details