Automated Wheel Chair Using Multiple Methods In Android Technology

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Abstract- *The wide spread prevailing loss of limbs is day-to-day scenario due to wars, accidents, age and health problems. The main aim of the project is to automate the Control of Wheelchair movements with all directions and producing the emergency alert as well. Elderly peoples can't walk; we have to deal with these peoples each day. Thus, we are utilizing the wheelchair for transporting these peoples. It is difficult for the incapacitated and elderly individuals to move a mechanical wheelchair, which huge numbers of them typically use for velocity. Subsequently there is a requirement for outlining a wheelchair that is clever and gives simple transportation to the physically-challenged peoples as well as elderly peoples. In this specific circumstance, an endeavor has been made to propose an idea controlled wheelchair, which utilizes the caught signals from the client's activity and procedures it to control the wheelchair. The triggers which are caught are converted into movement triggers by the microcontroller which thus moves the wheelchair. For all the entire system properly supports the elderly people to supplement their physical illness and provides an wonderful solution to live the independent life without other's physical needs for moving from one place to other place in respective places.*

Keywords- Electronic Wheel Chair, Healthcare, Transportation.

I. INTRODUCTION

As of late as the silver age has been exponentially expanding, the social requests about the personal satisfaction likewise have been expanding relatively to them. Numerous mechanical specialists have been attempting to consolidate the apply autonomy ability into the welfare frameworks for the impaired and the elderly. Since a guide robot for the visually impaired was first introduced, there are numerous looks into about such guide robots 2, 3, 4 and many more. A wheelchair robot for versatility helps for the disabled is likewise introduced.

II. RELATED WORK

In the year of 2014, the authors "R. R. J. P. D. H.J. Pandya, Hyun Tae Kim" proposed a paper titled "Mems based low cost piezo resistive micro cantilever force sensor and sensor module", in that they described such as: in the present work, we report manufacture and portrayal of a minimal effort MEMS based piezo resistive smaller scale drive sensor with SU-8 tip utilizing research facility made silicon-on-protector (SOI) substrate. To plan SOI wafer, silicon film (0.8 μm thick) was stored on an oxidized silicon wafer utilizing RF magnetron sputtering procedure. The movies were saved in argon (Ar) surrounding without outside substrate warming. The material qualities of the sputtered saved silicon film and silicon film strengthened at various temperatures (400– 1050 °C) were considered utilizing nuclear power microscopy (AFM) and X-beam diffraction (XRD) methods. The remaining worry of the movies was estimated as an element of strengthening temperature. The worry of the as-stored films was seen to be compressive and strengthening the film over 1050 °C brought about a tractable pressure. The worry of the film diminished bit by bit with increment in strengthening temperature. The created cantilevers were 130μm long, 40μm wide and 1.0μm thick. A progression of force– removal bends were acquired utilizing manufactured micro cantilever with business AFM setup and the information were investigated to get the spring steady and the affectability of the created micro cantilever. The deliberate spring steady and affectability of the sensor was 0.1488 N/m and 2.7 mV/N. The micro cantilever drive sensor was incorporated with an electronic module that distinguishes the adjustment in protection of the sensor concerning the connected power and shows it on the PC screen.

In the year of 2009, the authors "Y.-J. Li, J. Zhang, Z.-Y. Jia, M. Qian, and H. Li" proposed a paper titled "Research on force-sensing element's spatial arrangement of piezoelectric six component force/torque sensor", in that they described such as: this framework proposes a novel piezoelectric six-part drive/torque sensor with four-point supporting structure, and makes look into on constrain detecting component's spatial game plan of the novel sensor. Two sorts of various spatial plans are propelled, tablet and square course of action. The numerical models are constructed

and figured. The effect on utilizing execution of the two sorts of various spatial plans of the sensor is dissected by FEM (ANSYS programming). Keeping in mind the end goal to examine the legitimacy of the proposed strategy, a model of piezoelectric six-segment compel/minute sensor is created with two sorts of various spatial courses of action, and trademark trial of the piezoelectric six-part constrain/minute sensor are performed. The test demonstrates that both of the diverse spatial course of action sensors could be utilized to quantify six-segment compel/torque, however the square game plan piezoelectric six-segment constrain/minute sensor is more reasonable for estimation of six-part drive/torque on pivot. The obstruction blunders of square plan sensor are under 5%, which are lower than those of the capsule course of action sensor. The common frequencies in six ways are broke down and talked about.

In the year of 2014, the authors "Y. Tenzer, L. P. Jentoft, and R. D. Howe" proposed a paper titled "Inexpensive and easily customized tactile array sensors using mems barometers chips", in that they described such as: this framework introduces another way to deal with the development of material exhibit sensors in view of barometric weight sensor chips and standard printed circuit sheets (PCBs). The chips incorporate firmly coordinated instrumentation enhancers, simple to-computerized converters, weight and temperature sensors, and control hardware that gives phenomenal flag quality over standard advanced transport interfaces. The subsequent exhibit hardware can be effortlessly exemplified with delicate polymers to give strong and agreeable getting a handle on surfaces for particular hand outlines. The utilization of standard business off-the-rack innovations implies that exclusive essential electrical and mechanical aptitudes are required to fabricate successful material sensors for new applications. The execution assessment of model clusters exhibits incredible linearity (regularly <;1%) and low commotion (<;0.01 N). Outside tending to hardware enables different sensors to impart on a similar transport at more than 100 Hz for each sensor component. Sensors can be mounted with as close as 3#5-mm dispersing, and spatial motivation reaction tests demonstrate that straight strong mechanics-based flag preparing is achievable. This approach guarantees to make delicate, powerful, and modest material detecting accessible for an extensive variety of mechanical technology and human-interface applications.

Past System Analysis

In existing system, there is automated way to operate a wheel chair. So the wheel chair can be operated with own hand or with someone's help. So, handless people felt very difficult to operate it. To overcome these problems we go for proposed system. The existing wheelchairs have some disadvantages and some of them are listed below: (i) The wheel chair robot is difficult to operate (ii) There is no alternative method is used to operate the wheel chair in this system (iii) Low in Performance, requires heavy manual operations to perform (iv) Cost Expensive in nature and (v) Modes of control is limited, only higher end models contains some interesting features, but it is too costly to purchase.

III. PROPOSED SYSTEM

In our project, we are introducing advanced method to control the wheel chair with the help of embedded systems. Here we are introducing two methods for controlling the wheel chair. (a) Hand gesture control (b) smart phone control. Here robot can be operated in four ways like forward, reverse, left and right with the hand Gesture signal movement. But some cases hand gesture is not possible to operate a wheel chair. Therefore we introduce alternate way to operate a wheel chair with the help of android mobile. Using this android application, it can be used with 3 in 1 option. We can control the wheelchair robot with three methods using this application.

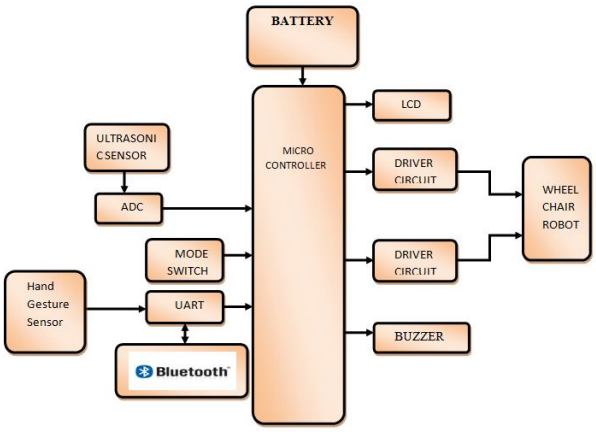

Fig.1 Proposed System Architecture

There are Steering control, Voice control, and touch screen button control. Also Ultrasonic sensor is used to detect the obstacle. LCD is used to display the various statuses. The wheel chair can also be operated automatically using a pre-defined path. The proposed wheelchair model has lots of advantages and some of them are listed below: (i) this method is easy to operate the wheel chair. (ii) In addition of voice is used to control the wheel chair. (iii) For a safety monitoring of ultrasonic sensor is used. Since the design of the wheelchair robot is like the portable robot, numerous victories were introduced. Such looks into have been focused on detecting and way arranging since confinement and snag evasion are vital issues in the portable apply autonomy. However the real client of the wheelchair robot is the impaired, so the

wheelchair robot must ensure the wellbeing and dependability while thinking about the client's goal. In like manner, late investigations embraced a human-robot interface in order to bring a human into the robot criticism control circle. We can see that a bio-flag, for example, the electro myo gram (EMG) and human movement, for example, look bearing and facial direction were used as the interface technique.

Architecture of the wheel chair robot with HRI. The incapacitated and the elderly are not ordinary physically, so the client's order might be erroneous. What's more, the tangible data got by outside sensors.

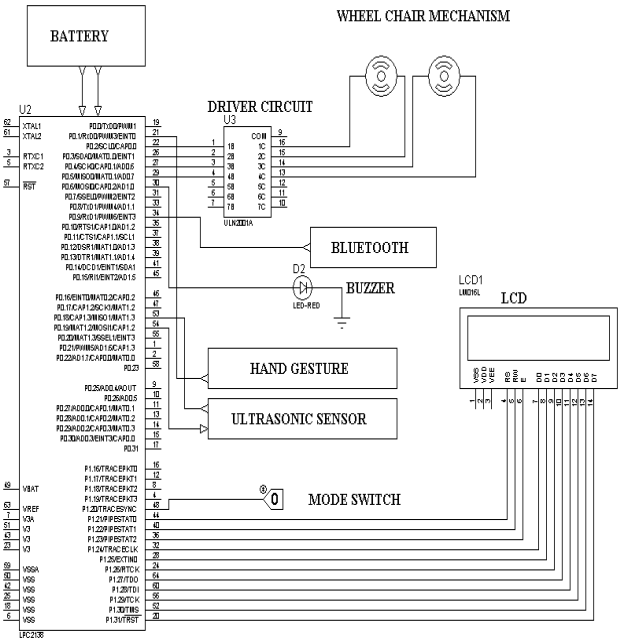

Fig.2 Circuit Diagram of the Proposed System

For example, vision, sonar, and laser go discoverer likewise incorporates vulnerability. In these reasons, the security is the most extensive issue in the welfare mechanical technology.

Hand gesture

Gesture recognition empowers people to speak with the machine and connect normally with no mechanical gadgets. Utilizing the idea of Gesture recognition, it is conceivable to point a finger at the PC screen so the cursor will move likewise. Motion location uses four directional photodiodes to detect reflected IR vitality to change over physical movement data to computerized data. The Gesture motor suits an extensive variety of cell phone motioning prerequisites: straightforward UP-DOWN-RIGHT-LEFT motions or more mind boggling motions can be precisely detected. Motion recognition, closeness identification, and RGBC shading sense/surrounding light sense usefulness is controlled by a state machine, which reconfigures on-chip simple assets when each useful motor is entered. Each utilitarian motor contains controls like pick up, ADC incorporation time, hold up time, perseverance and edges that administer the activity. The control of the drove drive stick, LDR, is shared amongst vicinity and Gesture usefulness. The shading/ALS motor does not utilize the IR LED, but rather cross talk from IR LED discharges amid an optical example transmission may influence comes about. Depending on the type of the input data, the approach for interpreting a gesture could be done in different ways. However, most of the techniques rely on key pointers represented in a 3D coordinate system. Based on the relative motion of these, the gesture can be detected with a high accuracy, depending on the quality of the input and the algorithm's approach. In order to interpret movements of the body, one has to classify them according to common properties and the message the movements may express

Fig.3 Gesturing Device

Algorithm Precedence

Step-1: The system consists of mode switch to select different modes of operation.

Step-2: Based on the mode selected, the gesture or voice based chair control is done.

Step-3: The hand gesture module is used to drive the robot using hand gesture signal.

Step-4: The ultrasonic sensor detects the distance between the person and the obstacle and reports it to controller.

Step-5: Based on obstacle the wheel chair is driven in such a way it doesn't collide.

Step-6: The user transmits a voice signal to mobile to drive the wheel chair

Step-7: The signal is provided to the Bluetooth receiver and the respective motor is driven.

IV. EXPERIMENTAL RESULTS

The following figure illustrates the simulation view of the wheelchair design.

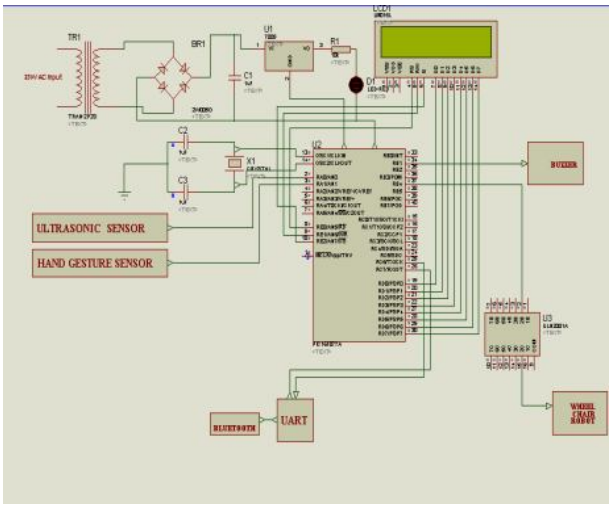

Fig.4 Simulation Model

The following figure illustrates the hardware design view of the wheelchair design.

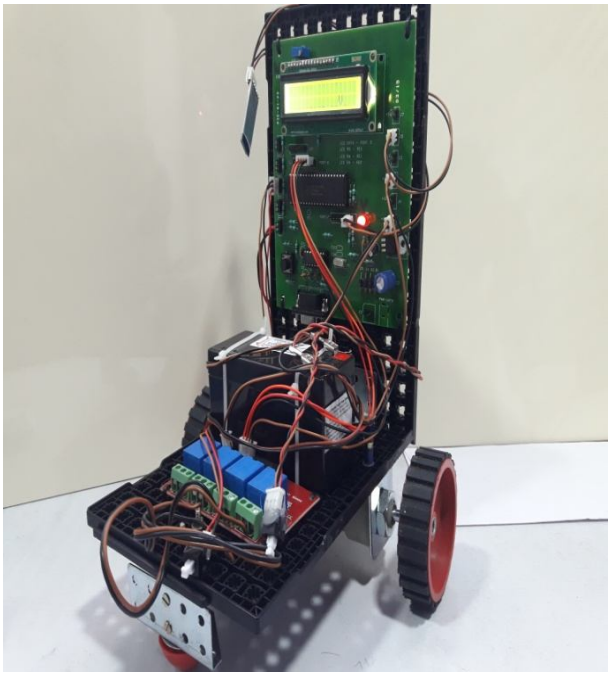

Fig.5 Wheelchair Design

V. CONCLUSION

The system eliminates the dependency of human for the disabled people to navigate them. The user can operate the chair using both hand gesture and voice signal. This helps for multiple disabled people of certain kind to use this system. Thus the physically challenged people can operate their vehicle independently without any additional assistance. They are free to control the vehicle using Voice commands or Gesture board. Thus the motors can move freely based on the user direction.

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