An Embedded Control System for Smart Wheel Chair

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Abstract- Ubiquitous accessories are acceptable a allotment of people's circadian life. Acute accessories not alone aid to people's activity but aswell are acceptable a acute allotment of physically challenged and age-old people. The charge for safe and absolute advancement for the age-old and concrete challenged humans is of prime concern. The cardboard deals with conception of a Acute Wheel-Chair (SWC) that mainly focuses on the mentioned affair in a actual affordable way and to a greater extent. The Wheel-Chair is controlled by RTOS as its amount operating system. It consists of a touch-screen based aeronautics arrangement forth with blow blockage and abatement detection. A semi-automatic eyes function, affection amount sensors and physiological accent sensors accept been integrated. GPRS arrangement is acclimated for area assurance and GSM is acclimated to acquaint in those cases area assertive aberrant contest like falling, blow or bloom issues are trigged. The real-time alternation functions are advised with the motive to accomplish the ser operating the wheel-chair absolutely arrogant and his alternation with the ambiance can be like of a accustomed person.

I. INTRODUCTION

This cardboard describes the architecture of a smart, motorized, and Wi-Fi controlled wheelchair application anchored system. Proposed architecture supports of a Wi-Fi activation arrangement for physically and abnormally able bodies accumulation the chiral operation. This cardboard represents the "Wi-Fi-controlled Caster chair" for the physically abnormally able bodies and area the Wi-Fi command controls the movements of the wheelchair. The Wi-Fi command is accustomed through a acute buzz accessory accepting Wi-Fi and the command is transferred and it is adapted to a cord by the consecutive Ascendancy for ARM and is transferred to the Wi-Fi Bore ESP8266 affiliated to the ARM lath for the ascendancy of the Wheelchair. This arrangement was advised and developed to save the cost, time and activity of the patient. Accelerated sensor is aswell fabricated a allotment of the architecture and it helps to ascertain the obstacles lying on the arch in a way of the wheelchair that can arrest the access of the wheelchair and memes sensor for abatement detection.

II. MOTIVATION TO THE PROBLEM

The real-time alternation functions are advised with the motive to accomplish the user operating the wheel- armchair absolutely self-dependent

Problem definition

To access the free capabilities of the swc (smart caster chair), the GPRS arrangement can be added to the arrangement and the arrangement for automatic/autonomous active can be implemented to accomplish the user ability his destination after abundant effort.

2. 1 George Frehia [7]

Abstract:
The smart assistive accident free wheel chair system is designed to give a chance for paralyzed patients to move freely within their surroundings. Like the case of any other automated wheelchair, the patient will not exert any effort to move the chair. In the proposed design, the patient will control his chair by simple verbal commands being analyzed by a built-in speech recognition system. Moreover, several additional features are implemented such as heart rate and temperature measurement systems in addition to accident control and obstacle detection systems. All these will be inserted in a webpage in addition to a mobile application to continuously monitor the patient's current status. Therefore, the designed wheelchair supports disabled people with secure mobility in addition to continuous vital signs monitoring.

2.2 Hah-Yen Yu[8]

Abstract:
Automatic and intelligent health care service becomes important with the growth of aged population. To achieve intelligent mobility for a smart wheelchair, we proposed to construct a friend user-environment interface that users can interact with the living environment like a normal healthy person. An integrated interactive platform, including touch control panel, together with several cameras, and wireless sensors, is embedded on a wheelchair to achieve human interaction. Interaction functions, such as appliance control, semi-automatic vision assistant function, and physiological information monitoring function etc. have

been developed to achieve the target. The goal of light mobility can be reached and the overall smart wheelchair system comprises: a mobile vehicle, information sensor modules, analysis control modules and an image capture unit which is set towards the headrest direction of the mobile vehicle to capture

Human facial image data. The physiological sensor module is used for sensing user physiological data. The analysis control module seamlessly transmits monitoring signals to a caregiver side in response to the image data or physiological data. These user-environment interaction functions are developed under the design target of human technology that the wheelchair user can interact with the environment like a normal person.

2.3 Amber lay Ruiz-Serrano [5]

Abstract:

Many users with motor disabilities, such as quadriplegics are unable to handle a power wheelchair securely, without causing harm to others, to themselves or their surroundings. Smart wheelchairs usually have been instrumented with a collection of sensors and computers using systems and algorithms that have been designed to provide safe navigation assistance through collision avoidance. This paper proposes a real-time obstacle avoidance embedded system adapted to work with a multimodal navigation interface. 26 Ultrasonic sensors (Sonar's) were used to provide feedback of the distance between the wheelchair and the obstacles.

2.4 Deepest k rathore, pulkit srivastava [1]

Abstract:

In this paper we propose an intelligent wheelchair which can assist physically handicapped, visually impaired as well as elderly people. Elderly and physically challenged people often find themselves unable to do their daily routine work without other's help. In today's fast world where people don't have enough time for others, elderly and physically challenged people need to be independent. Our wheelchair is developed with a view to serve the purpose. It consists of a navigation system which makes use of accelerometer and magnetometer, the system contains a navigation pad which can be held in hand or tied to the head for navigating the chair. It also has obstacle avoidance system comprising of four ultrasonic sensors, real time location tracking system which makes use of RFID for tracking the chair inside a building and voice guidance system to assist the visually impaired. Thus, it is a multipurpose intelligent wheelchair which is cost-effective and can assist people in their daily work.

2.5 Mihoko niitusuma, Terumi chi ochi, and Masahiro yamaguchi [6]

Abstract:

This paper presents interaction between a user and a smart electric wheelchair. We propose a personal mobility tool (PMT) which integrates autonomous mobile robot navigation technology with intuitive and cognitive interaction between a user and a smart wheelchair. An intuitive and non-continuous input method to enable a user to specify a direction in which he/she wants to go is proposed. Also, to help a user interpret robot behaviours, an output interface to realize informative communication between a user and the PMT is described. In this paper, we introduce a vibrotactile interface to present environmental information from a smart wheelchair to the user. We conducted experiments to study the possibility of utilization of the input interface and the

Output vibrotactile interface. Experimental results show that the input interface can be successfully used even by users who had not used it before. In the experiments with the vibrotactile interface, users tried to detect distance and angle toward obstacles based on vibration stimuli. Through the experiments, we found that it was difficult for users to detect the exact positions of obstacles, but they were able to detect the direction of the obstacle movement.

III. BLOCK DIAGRAM

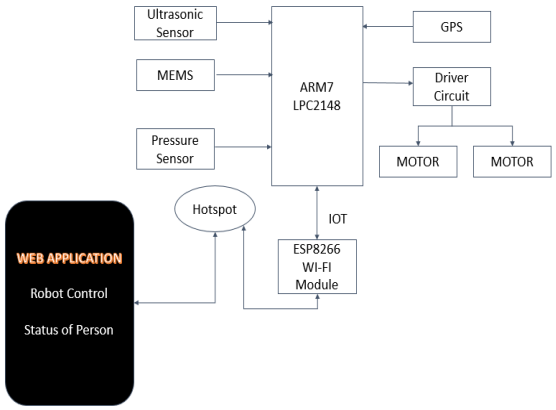


Fig : Block diagram of anchored ascendancy of acute caster chair

DESCRIPTION

The Figure apparent aloft is the anchored ascendancy of acute caster armchair which consists of accelerated sensor, mems, burden sensor, disciplinarian circuits, gps, ESP8266 Wi-Fi bore which are affiliated to arm board.

This activity describes the architecture of a simple, bargain ambassador based for the elderly, old and physically bedridden people. The limitations of the activity are with acceptable caster armchair which mainly includes edibility, weight and bound functions. Many development accept been fabricated in the caster armchair technology ,but these could nit aid the quadriplegics to cantankerous them apart .Automatic caster armchair has been application internet of things(IOT) technology by authoritative the server application the anew acclimated Wi-Fi bore alleged ESP8266 by this we can ascendancy the caster chair. A the aforementioned time we are application the MEMS sensor and Pulse sensor by this we can able to adviser the being bloom action .In this activity we are application the ARM7(LPC2148)Microcontroller area the Pulse and MEMS sensors are affiliated to the

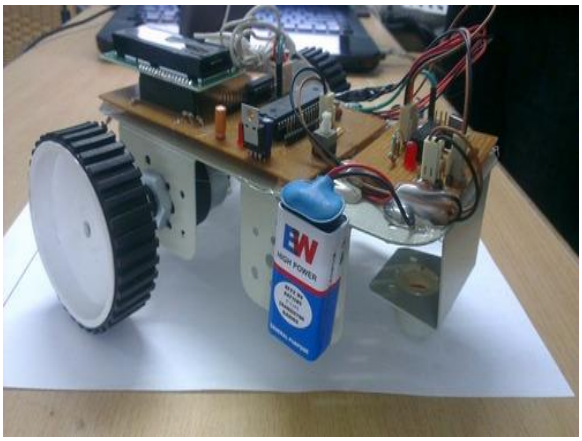
ADC channels .here we are application theL293D Disciplinarian ambit to disciplinarian the motors of the caster chair. Actuality we are application the GPS with the advice of this we can acquisition the exact area of the armchair could be bent and we can able to acquisition area the abatement has taken place. The allegation adumbrated the claim of a greater compassionate of the altered beliefs, ethics and cultural community aural the Aboriginal communities if it comes to compassionate the appellation 'disability'. This needs to be addressed through cantankerous cultural apprenticeship and training to accommodate a added able affliction account and a added acknowledgment of the accent of cultural adequacy aural accepted agencies accouterment affliction services. Other allegation articular were the challenges and obstacles that action if prescribing, trailing, application and advancement wheelchairs in rural and bound areas. There still charcoal an astronomic assortment in the design, application and supply of wheelchairs to these locations. The wheelchair architecture cast was developed to abetment with wheelchair best and options on chairs that are possibly ill-fitted for these environments. Account and aliment issues are consistently accent as a cogent barrier to users' achievement and clinicians' prescribing practices in attention to wheelchair decree and use. Additional analysis and appraisal is adapted on a amount of accessible solutions articular in this project; a. bigger training in wheelchair decree needs for these locations b. the balloon of assorted wheelchair options in bound and rural locations c. added analysis into the development of a planned bactericide aliment account d. advance of account and abutment from suppliers and articles e. analysis into added localized account and aliment centres; and f. advance abstracts accumulating on the use and aliment of wheelchairs. Two final credibility the activity has accustomed are, a. The charge for advancing development of action and planning for allotment of accessories in bound and rural locations; and b. The charge to advance initiatives to acquaint clinicians and suppliers of the guidelines and accommodation of the CAEP affairs as activated to Aboriginal users in bound and rural areas. In arbitrary what accept to be kept in apperception and advised aboriginal is the charge of the end user in adjustment that the a lot of adapted archetypal of wheelchair that meets their specific needs can be provided. A absolute aftereffect for this activity would be that the accessible solutions categorical aural the address will be put into place. These accept the abeyant to radically advance the advancement and anatomic ability for a wheelchair user active with a affliction in bound and rural Aboriginal communities.

IV. CONCLUSION

The activity was adjourned to analyze acceptable wheelchair options for use in rural and bound Aboriginal communities. However the ambit of the activity broadened from belief wheelchair options to cover cultural application if prescribing wheelchairs, allotment issues, account and aliment needs, the supply of abutment casework aural these communities, as able-bodied as ecology factors that access wheelchair advancement and performance. The allegation from the check were based on a almost baby sample admeasurement and these needs to be advised if interpreting the after-effects of the analysis and the accessible solutions that accept been identified.

V. FUTURE WORK

Obviously, abundant approaching plan charcoal to be completed afore the SWCS is accessible for commercialization. This plan includes developing hardware, software, and enclosures; creating accoutrement and instructions to abridge the assignment of configuring the SWCS for alone users; and testing the arrangement with associates of the ambition user population.



Experimental results

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