

NECK MOVEMENT CONTROLLED WHEEL CHAIR USING IoT

Dr.B.Shadaksharappa¹, T.K.Pradeep Kumar², Shivashankar³, Sujay.S⁴, Surya Prakash.S⁵, Santhosh.M⁶

ABSTRACT: Wheelchair can expand the lives of many impaired humans. For debilitated humans human placed a wheel seat which may be moved with the resource of the use of hands for the those who do not have legs. Be that as it is able to, the people organizations who do not have legs simply as fingers can't go with the flow their wheel seat without certainly all and sundry else. They need a few other individual to transport their wheel seat. Be that as it could, some of the time such person faces this sort of big quantity of troubles within the event that they didn't get any man or woman to move their wheel seat. So we have got concept of the association utilizing four person switches which can be sorted thinking cautiously trends. The character who's running the wheelchair is probably equipped with a device which is ready around the neck of the person that is beneficial to push the seat beforehand and transfer bearing and now not the usage of a bodily or intellectual stress. For the development of the neck we are the usage of far flung RFID innovation.

I. INTRODUCTION

The amount of population in incapacitate individuals is increasing because of different reasons, as an example, avenue mishaps, premises fall, suicide times, catastrophic occasions like seismic tremors, and so on. There have to be some techniques for device that could help this population with making headway. This populace dreams a help that is given by using wheelchair. The pushing wheelchair is the underlying one wherein the purchaser needs to push the seat with the hands. It offers weight on the client whilst going for a protracted separation. So with the assist of innovation and human endeavors the opportunity of programmed wheelchair have become advanced. A mechanized wheelchair relies upon on a few data interfacing device which offers contribution to the engine. The engine bureaucracy the statistics gave and makes the comparing circulate in like manner (as a long way as improvement – glide left, the front, once more, right). With the presentation of android Smartphone inside the framework, the operating seems to be plenty less unpredictable. The framework seems to be very smooth to apply to the purchaser. The Internet of Things (IoT) is the combination of quite recognizable implanted figuring gadgets in the contemporary Internet framework. Normally, IoT offers propelled community of gadgets, frameworks, and administrations that gives tool-to-machine interchanges (M2M) and spreads an assortment of conventions, areas, and programs.

The Five inclinations of the wheelchair can be depicted as following:

1. Moving beforehand
2. Moving in opposite
3. Turning to 1 factor
4. Turning to at least one thing
5. Stop scenario

Its a essential language, a wheelchair is a device with wheels empowering easy development, which interact a definitely crippled individual to move around with much less reliance on others. Individuals have handicaps with their palms, foos, decrease furthest factors which locations a cutoff to perform commonplace project of their every day lifestyles.

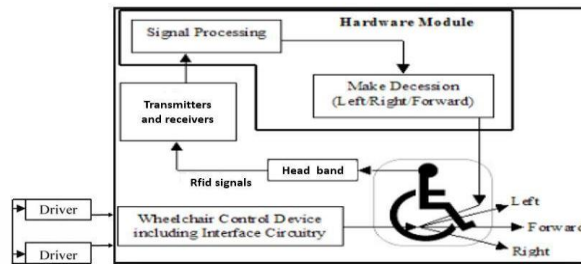
II. SYSTEM ARCHITECTURE

Frameworks configuration is the way toward characterizing the engineering, modules, interfaces, and facts for a framework to fulfill indicated requirements. Frameworks configuration may be viewed as using frameworks hypothesis to object improvement. There is some cowl with the orders of frameworks exam, frameworks format and frameworks constructing. In the occasion that the greater huge trouble of item improvement "mixes the factor of view of showcasing, plan, and assembling into a solitary manner to cope with object development, at that factor

configuration is the demonstration of taking the advertising and marketing records and making the shape of the object to be fabricated. Frameworks configuration is ultimately the manner in the direction of characterizing and creating frameworks to meet indicated conditions of the client. The physical shape identifies with the genuine information and yield techniques of the framework. This is clarified as a ways as how records is contribution to a framework, how it's far checked/authenticated, how it's far dealt with, and the way it's miles shown. In bodily shape, the accompanying situations about the framework are selected.

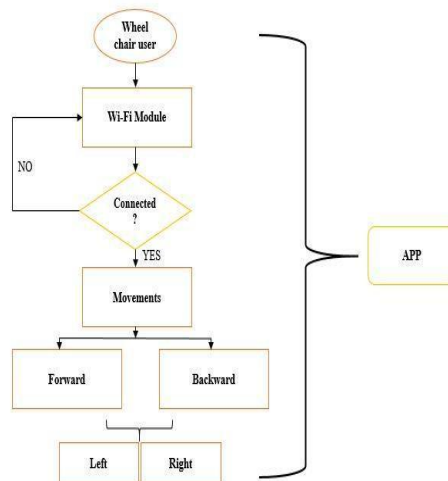
1. Input prerequisite,
2. Output conditions,
3. Storage conditions,
4. Processing prerequisites,
5. System manage and reinforcement or recovery.

UI Design is worried approximately how clients add information to the framework and with how the framework presents records once more to them. Information Design is worried approximately how the information is spoken to and put away in the framework. At lengthy final, Process Design is worried about how records travels via the framework, and with how and wherein it is legal, made sure about in addition to modified because it streams into, through and out of the framework.



DATA FLOW DIAGRAM

“A Data flow diagram (DFD) is a graphical representation ion of data processing of the flow of the data through an information system, modeling its process aspects. A DFD is often used as preliminary step to create an overview of the system, which can be elaborated later. DFD can also be used for visualization of data processing. A Data shows what kind of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored. It does not show information about timing of the process or information about whether processes will operate in sequence or in parallel. The data flow model for the project is as follows.”



At first the user is connected to wifi module and if its connected it will do the operation if not it goes back to the 1st step and connects again. Once initialization is done the functions are performed and all the data are stored in the app.

SYSTEM IMPLEMENTATION

Modules

- BCM 2835-Rasberry pi
- RFID Tag wireless
- Motor drivers
- Temperature sensor
- Heart beat sensor
- Buzzer
- Wifi module

POWER CALCULATIONS

1.Torque required on a flat surface

Normal force (Fn) = force applied = mg

$$= 100*9.81$$

$$= 981N$$

$$= 0.2*981$$

$$= 196.2 N$$

$$= 196.2*0.18$$

$$= 35.316 N-m$$

2.Torque required on slope

Stair dimensions

Land: 254.0 mm

Rise: 177.8 mm

Slope of stair () = $\tan^{-1}(177.8/254)$

$$= 35^\circ$$

Total mass acting (including setup) = 100kg = 100*9.8 = 981N Normal force acting (Fn) = mgcos

$$= 100*9.81*\cos(35^\circ)$$

$$= 803.58 N$$

$$= 0.2*803.58$$

$$= 160.7 N$$

Opposing force (Fo) = mgsin

$$= 100 \times 9.81 \times \sin(35^\circ)$$

$$= 562.67 \text{ N}$$

$$= (160.7 + 562.67) \times 0.18$$

$$= 130.20 \text{ N-m}$$

3. Motor torque generated

Power of motor (P) = 2 NT60180 = 2 $1.5T60 \times 0.6$ (i.e., 0.6 = efficiency of the gear box) Torque at the mid-shaft
 $T_{mid} = 687.54 \text{ N-m}$

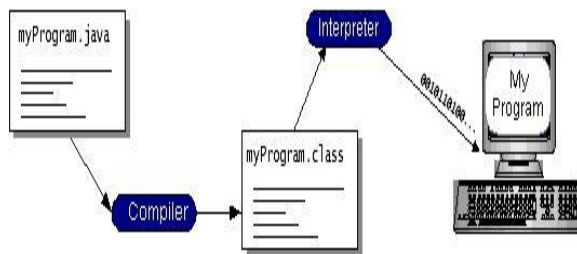
Torque generated at wheels = $T_{mid} / 1$ (1:1 ratio sprocket arrangement)

$$= 687.5 / 1$$

$$= 687.5 \text{ N-m}$$

SOFTWARE ENVIRONMENT

Java technology is considered as both a programming language and also a platform. The Java programming language is regarded as a high-level language. In most of the programming languages, a program is either compiled or interpreted so that can run in the computer. The Java programming language is considered as unusual in which a program may be compiled and interpreted. By using the compiler, initially a program is translated into an intermediate language known as *Java byte codes* —in which the platform-independent codes were interpreted with the interpreter present on the Java platform. The interpreter will parse and then runs each of the Java byte code instruction present on the computer. The compilation will occur only once; where the interpretation will occur each time when the program is being executed. The following diagram will illustrate about the working.



Java Interface

The Java byte codes are regarded as the tool code commands within the event of Java Virtual Machine (Java VM). Every one of the Java mediators, it is probably each an improvement system or a Web software which could run applets, is actualized by using the usage of the Java VM. The Java byte codes will assist with making "compose as quickly as, run anyplace" to get manageable. The software program can be organized into byte codes present on any of the extent which has a Java compiler. At that factor the byte codes can run on any of the execution of the Java VM. It manner that as long as the PC has a Java VM, the same software program that is written inside the Java programming language might also additionally run on Windows 2000, referred to as a Solaris computer, in any other case on an iMac.

Keil c Compiler

The Keil C51 C Compiler for the 8051 microcontroller is the most broadly identified 8051 C compiler on earth. It offers a wider variety of highlights than some other 8051 C compiler on hand today .The C51 Compiler permits you to compose 8051 microcontroller applications in C that, as soon as integrated, have the productiveness and tempo of low diploma computing construct. Language expansions within the C51 Compiler offer you with entire

get admission to to all assets of the 8051. The C51 Compiler makes an interpretation of C supply information into relocatable item modules which comprise whole representative facts for troubleshooting with the μ Vision Debugger or an in-circuit emulator. Notwithstanding the item document, the compiler produces a posting report which can also as an alternative include image table and circulate reference statistics.

VII. TESTING

The usage of checking out the framework is to distinguish the mistakes. Testing is viewed due to the fact the manner closer to trying to recognize each feasible bogus or shortcoming gift in the work item. It will deliver an method to checking the usefulness of parts, gatherings, sub congregations, and a completed item.

Sorts OF TESTS

The Unit checking out:

The Unit attempting out will embody the making plans of experiments which approve that the inward software program intent is accurately jogging, and the contributions of that software will deliver the valid yields. The entirety of the selection branches and the development of interior code want to be permitted. It is taken into consideration because the attempting out of person programming gadgets for the software.

The Integration checking out:

The Integration checks were meant for finding out the coordinated programming components with the intention to decide after they virtually run as one software program. Testing is taken into consideration as an occasion pushed and it's far more and more concerned with the aid of the essential result of fields or presentations.

The Functional take a look at:

The Functional assessments will provide an orderly show off that the capacities which is probably attempted have been accessible as portrayed via the usage of the industrial agency and the specialized requirements, consumer manuals and the framework documentation.

The System Test:

The System trying out will assure that the complete coordinated programming framework will meet the conditions. A setup is tried to assure unsurprising and stated results. The case of framework checking out is the layout of arranged framework blend test. The System checking out will be based at the machine streams and portrayals, underlining the pre-driven technique joins and the aggregate focuses.

VIII PERFORMANCE EVALUATION VALIDATION

The Test Results:

The entirety of the experiments which are referenced above are handed correctly. No imperfections have been professional.

The Acceptance Testing :

The User Acceptance Testing is the easy degree in any undertaking and it calls for the large help from the end client. It will likewise assure that the framework will meet the practical conditions.

The Test Results:

The entirety of the experiments which may be referenced above are exceeded efficaciously. No imperfections have been skilled.

IX .CONCLUSION

The perfect end result of this venture will empower an superb straightforwardness in improvement and associating of impaired people with immaterial human endeavors. Likewise, it's miles a few aspect but difficult to utilize and work due to the fact the development are handiest one touch away. The module is decreased and much less expensive; the particular sensors gift in the version along the health observing framework makes it an advanced module, which is really strong and supportive. This Wheelchair might be monetary and might less expensive to average citizens. This framework can be made profoundly green and effective if natural conditions are saved up.

The association for retaining up those ecological situations is probably an onetime hypothesis for any real application. The strolling fee of this framework is lots of lower as evaluation with terrific frameworks carried out for the same reason. Wheelchair is straightforward to work and needn't trouble with any outer assist. All easy guy can join for this wheelchair to get self sufficient on the off risk that they hold a complicated mobile

X. REFERENCES

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