

Voice Controlled Robotic Wheel-Chair for Physically Disabled with Live Data Streaming

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ABSTRACT: Apply autonomy is the branch of mechanical building, electrical designing and software engineering that arrangements with the outline, development, operation, and use of robots, and additionally PC frameworks for their control, tangible input, and data preparing. These advancements manage computerized machines that can assume the position of people in unsafe situations or assembling forms, or look like people in appearance, conduct, as well as discernment. Large portions of today's robots are roused by nature adding to the field of bio-propelled apply autonomy. Deciphering the constant stream of sounds originating from a human, continuously, is a troublesome undertaking for a PC, generally as a result of the immense variability of discourse. The same word, talked by the same individual may sound distinctive contingent upon nearby acoustics, volume, the past word, regardless of whether the speaker has a chilly, and so forth.. It turns out to be much harder when the speaker has an alternate accent. In any case, incredible steps have been made in the field since Davis, Biddulph, and Balashek outlined the principal "voice info framework" which perceived "ten digits talked by a solitary client with 100% exactness" in 1952.Currently, as well as can be expected perceive ceaseless, characteristic discourse, up to 160 words for every moment, with a precision of 95%.Live streaming has been a key aspect in this project as it helps in providing live feedback of the path traversed by the robotic wheel chair.

KEYWORDS: Digitalization, Live data streaming, synchronization, Voice- recognition.

I. INTRODUCTION

The fundamental point of our undertaking is to achieve a continuous synchronization amongst human and machine .One such approach is our concept of realizing a voice control over a robot and checking its development. The present point of this model is to control the development of the robot utilizing manual voice orders through Bluetooth talked via telephone. We likewise have joined camera on the board through which the way of the robot can be observed while sitting before a tablet .The configuration procurement of our model can likewise be stretched out to the utilization of physically handicapped individual as a Wheel seat.

"Make everything as simple as possible, but not simpler."

[Albert Einstein]

As stated by the connoisseur of tech field, it's important to make things as simple as possible but not as simple .Technology has its impact only when it is brought in to real world to severe humanity and mankind .One such approach is our design which aims at obliging the physically disabled people help monitor themselves without being dependent on others.

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II.LITERATURE SURVEY

1. D. Stoianovici, L. Whitcomb, J. Anderson, R. Taylor, and L. Kavoussi, "A modular surgical robotic system for image-guided percutaneous procedures," in Proc. Medical Image Computing and Computer-Assisted Interventions (MICCAI'98), Cambridge, MA, 1998, pp. 404–410.
2. "Electronic control of a wheelchair guided by voice commands" M. Mazo, F.J. Rodríguez, J.L. Lázaro, J. Ureña, J.C. García, E. Santiso, P.A. Revenga Departamento de Electrónica, Universidad de Alcalá de Henares (U.A.H.), 28871 Alcalá de Henares, Madrid, Spain.
3. "The High Performance HMI Handbook: A Comprehensive Guide to Designing, Implementing and Maintaining Effective HMIs for Industrial Plant Operations", by Bill Hollifield, Dana Oliver, Ian Nimmo, and Eddie Habibi, PAS 2008

III.METHODOLOGY

Our project mainly aims at alleviating the problem for the physically disabled people and helps them monitor themselves without depending on others for their life style. Present world actually aims at blending the digital world with the physical world and help people make their life easy. The present idea of our project is germane in that aspect where we try to interface human with the machine and help him communicate with the machine.

Can human really communicate with the machine??????

-This idea must seem quite lame to a lay man but the answer is a Yes!

The correspondence between the machine supposed the wheel seat in the present setting, and the client is achieved by giving charges over telephone, it is entirely closely resembling addressing a man. The client sitting on a wheel seat can screen himself by giving charges over android telephone. The new application that we have intended for this reason which depends on the Android stage is "CHARM". This application gives the attachment between the client and the machine by distinguishing the human voice and giving the charges to the Wheel-seat to move in that specific heading. The arduino smaller scale controller mounted on the Wheel –chair helps in the movement of the engines and makes movement which helps the client to move as indicated by his prerequisite. The term "Live Data Streaming" implies the way crossed by the Wheel Chair can be remotely transmitted to the tablet in live organization and its conceivable to monitor the incapacitated individual if there should arise an occurrence of crisis. The area of the individual can likewise be followed by the GPS mounted on the arduino. In this way the camera present on the wheel seat helps in getting continuous information transmission of the way crossed by the client. Generally patients with loss of motion and fit can't proceed onward their own particular and need extra backing, with this new approach its workable for those to screen themselves and lead a self ward life. In spite of the fact that, it's extremely bulky to mount a camera on to the robot its better to utilize the portable camera as its been an indispensable part of the framework which is utilized to give voice charges.

The very caption of the IEEE states "Advancing technology with humanity" which fosters the idea of ameliorating human life with the help of technology, throwing some light on the same context it's very necessary to involve technology in to human life and help them solve those problems. This paper also focuses on the same line to mitigate the problems faced by physically challenged people in daily life.

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IV.DESIGN ACQUISITION

TABLE I

HARDWARE REQUIREMENTS

1. Arduino Uno
2. Bluetooth Module (HC-06).
3. L293D Motor Driver
4.2x Gear Motor
5.2x Wheel
6.1x Chassis
7. Breadboard
8. Android phone
9. Connecting wires
10. GPS (Global Positioning system).

TABLE II

SOFTWARE REQUIREMENTS

1. "CH-ARM" Mobile application.
2. Arduino compiler.
3. IP-webcam application.
4. Proteus ISIS 7 Professional
5. MIT app inventor

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V.SIMULATION

The ground work such as a simulation is required for the implementation for any kind of hardware .Simulation is required to test the code for further process and make sure the design is tested. The simulation is implemented using a tool “PROTEUS ISIS 7 PROFESSIONAL”, this tool provides a good platform for implementing a good and accurate design before stepping over to hard ware implementation.

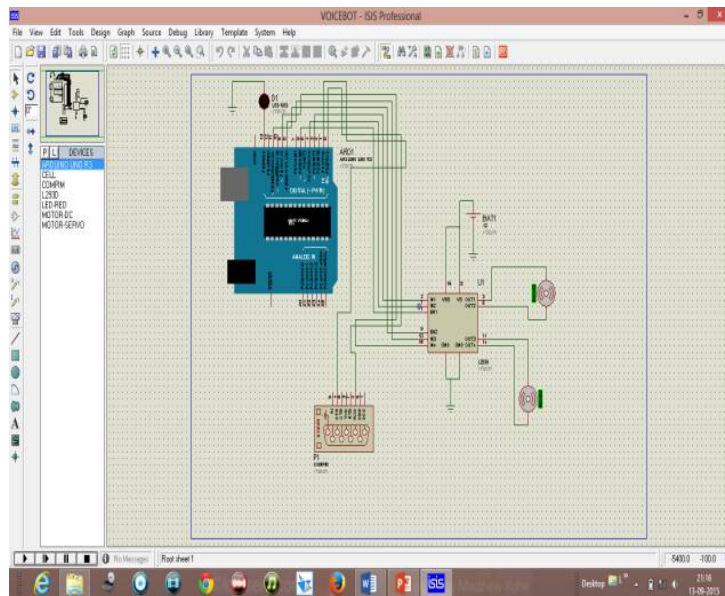


Fig.1.Simulation of the testing circuit using Proteus ISIS 7 Professional.

The order is gone through a correspondence port and the project is composed in the Arduino compiler and later subsequent to making the hex record it is dumped into the controller and the summons is passed. On the off chance that the given summon is '1' then the engine pivots in the clock savvy course and engine advances and if the order is "2" then the engine turns in against clock astute bearing and engine goes in reverse ,if "3" the it moves in the right heading, if "4" then it moves to one side .Hence in the same way it is conceivable to control the development of the robot through charges offered over to the phone.The orders given over telephone is changed over into a string by my new application "CH-ARM" ,this is then serially transmitted over to the Bluetooth(HC-05) mounted on the robot .

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V. HARD WARE IMPLEMENTATION:

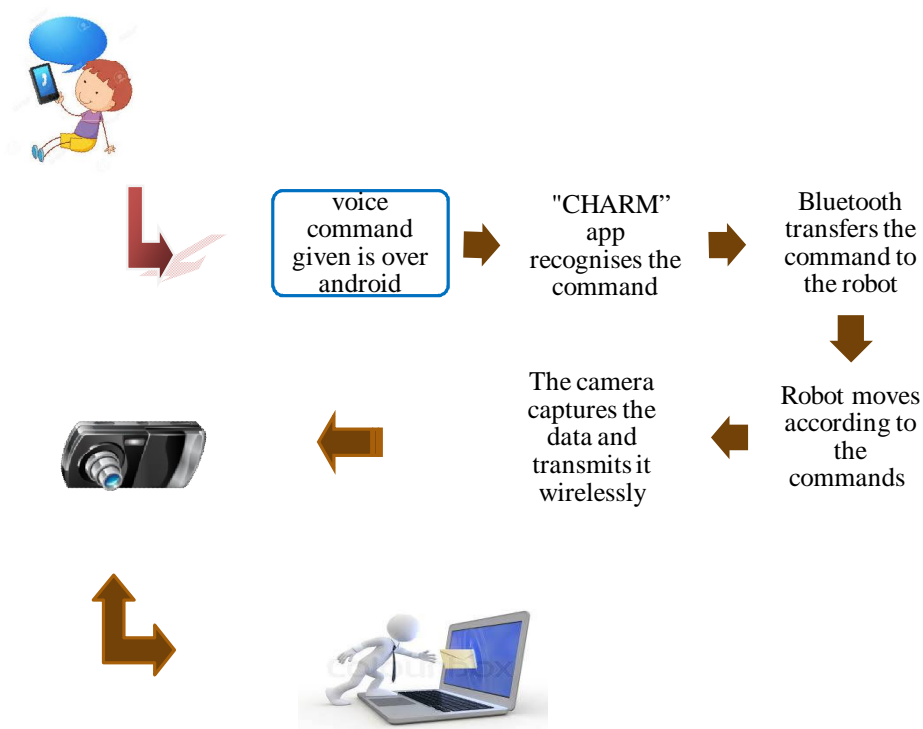


Fig2.Hardware implementation

A. CH-ARM Mobile Application.

The new "voice – recognition" application is being built on Android platform extensively for our project. The main aim of this application is detection of the voice and transfer of the detected voice serially over the Bluetooth to the Robotic wheel chair. The speech recogniser in the application helps in detecting the spoken voice over the phone that has the Android application " CH-ARM"; This app mainly aims at converting all kinds of interface to voice control and can make life much easy. Converting any interface to voice control helps in achieving a good interaction between human and machine. The application has been christened based on the names of two authors selecting the first two letters of their names.

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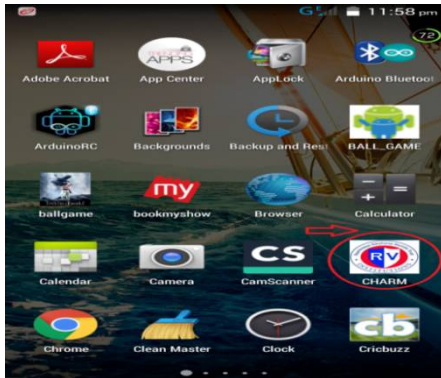


Fig 3(a).



Fig 3(b).

Fig 3 (a): Shows the application in the user's mobile. Clicking on the icon encircled in the image shall start the application

Fig 3 (b): The home screen of the application looks similar to the image and it reports the user to turn on the bluetooth..



Fig 3(c).

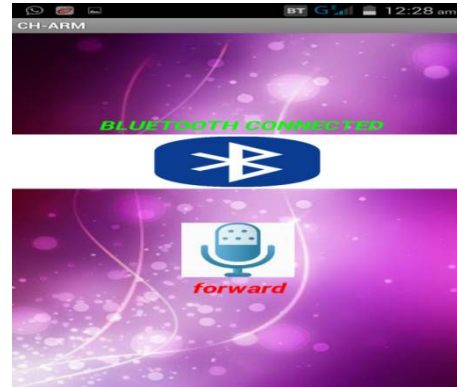


Fig 3(d).

Fig 3 (c): It shows the nearby Bluetooth devices to which it can be connected, and in our project we have used HC-05 Bluetooth module mounted on the Wheel chair. After turning on the Bluetooth the user is instructed to give voice commands by clicking on the speaker icon.

Fig 3(d): The command given over phone is detected and is transmitted through Bluetooth to the robotic wheel chair. As an example we can see the command "forward" being detected in the image.

VII. RESULTS AND DISCUSSION

1) The design model is extended on a larger scale and is used as a "Voice controlled Wheel Chair", which can help the disabled to monitor themselves without depending on others.

2) The live streaming facility available in our robot helps the user control the robot sitting in front of the laptop and helps him in monitoring the surrounding..

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3)It can also be used as a detector for military purposes to detect any intruder in regions where human accessibility is denied.

4)We have successfully implemented the hardware and have obtained 96.3% percentage success outcome and the live streaming of data has also made us flexible in obtaining the video.

5)It helps mitigate many problems to the handicapped people who are in serious spasm and is an advanced method in the field of medical science.

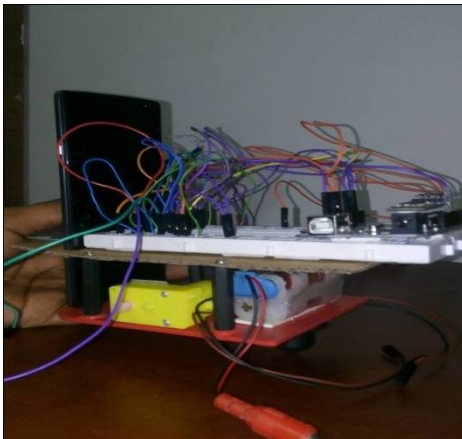


Fig 4(a) : The model of a Robotic Wheel Chair

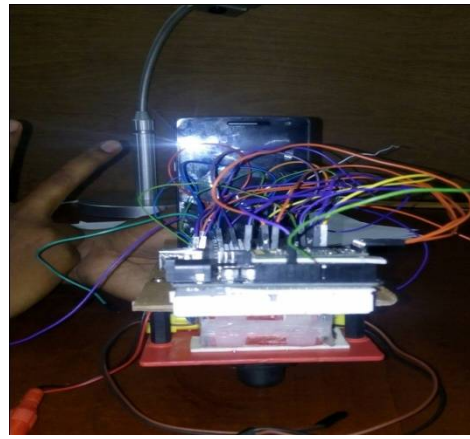


Fig 4(b):The Camera interfaced to the Robot.

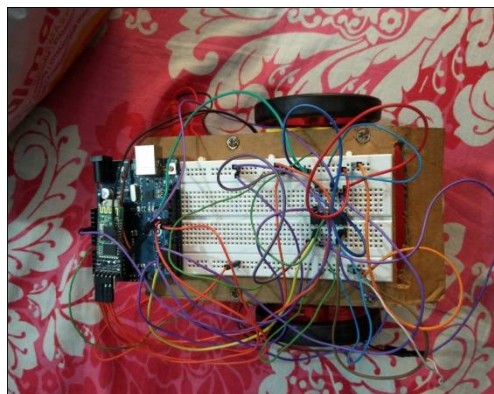


Fig 4(c). Final testing of the Robotic Wheel Chair.

REFERENCES

- [1] .D. Stoianovici, L. Whitcomb, J. Anderson, R. Taylor, and L. Kavoussi, "A modular surgical robotic system for image-guided percutaneous procedures," in Proc. Medical Image Computing and Computer-Assisted Interventions (MICCAI'98), Cambridge, MA, 1998, pp. 404–410.
- [2] M. Mazo, F.J. Rodríguez, J.L. Lázaro, J. Ureña, J.C. García, E. Santiso, P.A. Revenga, "Electronic control of a wheelchair guided by voice commands", Departamento de Electrónica, Universidad de Alcalá de Henares (U.A.H.), 28871 Alcalá de Henares, Madrid, Spain.
- [3] R. Suda and K. Kosuge. "Handling of Object by Mobile Robot Helper in Cooperation with a Human". Proc. Of the 32th Int. symposium on Robotics, pp.550-555, 2001.
- [4] MARTENS, C., RUCHEL, N., LANG, O., AND GRASER, A. A FRIEND for assisting handicapped people. IEEE Robotics and Automation Magazine 8, 1(2001), 57–65. SPORKA, A. J., AND SLAVIK, P. "Vocal control of a radio-controlled car". ACM SIGACCESS Accessibility and Computing, 91 (2008), 3–8.

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- [5] "The High Performance HMI Handbook: A Comprehensive Guide to Designing, Implementing and Maintaining Effective HMIs for Industrial Plant Operations", by Bill Hollifield, Dana Oliver, Ian Nimmo, and Eddie Habibi, PAS 2008.

BIOGRAPHY



Chandan Yadav.N was born in Karnataka, India, in 1996. He is presently perceiving his B.E (Bachelor of Engineering) degree in Electronics and Communication (VI semester) from R.V. College of Engineering, Bangalore-73. He has been an inquisitive participant in all the symposium held across Bangalore and other parts of country. He has also been involved in many inter-disciplinary projects held in college in collaboration with esteemed companies like T.E. Connectivity. His fields of interests are Embedded systems, Communication Systems, Networking System, Coding. He has also presented a paper in the "National level technical symposium & project expo" held at Madanapalle in collaboration with IEEE MITS student branch and raring to do more.



Amruth.B.M was born in Karnataka, India, in 1995. He is presently perceiving his B.E (Bachelor of Engineering) degree in Electronics and Communication (VI semester) from R.V. College of Engineering, Bangalore-73. He is an active learner and has presented a paper in the "National level technical symposium & project expo" held at Madanapalle in collaboration with IEEE MITS student branch. His fields of interest involve IOT, and has extensively worked on "Intelligent traffic management system" for the past six months. He has been an enthusiastic learner.