International Journal of Scientific Research in Science, Engineering and Technology
Print ISSN: 2395-1990 | Online ISSN : 2394-4099 (www.ijsrset.com)
doi : https://doi.org/10.32628/IJSRSET

Android Based Self-Parking Chair for a Modern Conference Room

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Article Info
Volume 7 Issue 5
Page Number: 65-69
Publication Issue :
September-October-2020

Article History
Accepted : 05 Sep 2020
Published : 10 Sep 2020

ABSTRACT

Android based self-parking chair is based on IOT devices and this smart chair are used to made modern and automated conference room. there are many automations done to build a smart chair like, chair which sense sound of clap and according to this sound chair move in forward direction. Basic motivation to build self-parking chair is to made automation in conference room and labs. In this world of automation where everything become an automatic, this self-parking chair build automation in conference room.

Keywords : smart conference room, self-parking chair, object detection, obstacle detection and avoidance, automation and robotics.

I. INTRODUCTION

In past few years we experience technology grows rapidly. Technological advancement gives us many smart devices.

Self-parking chair is an smart chair which is one kind of parking unit. And this chair is useful in many working area , smart chair can be useful in medical, military, educational purpose. Now a day self-parking chair model found by Nissan-technology and it gives much advantage in our life.

The main aim to build this smart chair is to made self-parking chair which move on flat surface. We can see, in conference room chair are not arranged. Every time one human resource required to arrange the chair and this is time consuming and tedious job. To avoid human intervention self-parking chair is made.

II. RELATED WORK

Existing intelligent system of smart chair is based on Nissan-technology which create self-align chair. This chair automatically returns to original position.

In this chair we are using different hardware like L293D driver to drive motor. IR sensors use to detect obstacle on given line. The main part of this system is processing unit. Here we are using arduino processor to control motors. This paper is focused on single task i.e. automatic parking of chair by using processor, sensor, actuator, etc.

The basic implementation flow of smart chair is user click on single button of the application which is installed on user's mobile phone. After that the signal passes from application to processor which is located on chair. These signals pass via Bluetooth model. And according to signal and processor chair moves in forward direction.

III. PROPOSED SYSTEM

In our system we create self-parking chair which park automatically after receiving signals from android application.

Since most of time in conference room or in labs people not arrange chair after session completed so, there is need to rearrange chair by human resource but this is time consuming job and every time human intervention is theirs. This is traditional approach to arrange labs or conference rooms. This required time as well as hard work. To avoid this, we provide new invention.

IV. OBJECTIVE OF PROPOSED

1. The main objective of building this system is to create self-parking chair.
2. Avoid human intervention.
3. Save money.
4. This system increases speed.
5. Eliminate need to manually arrange chairs.
6. This system requires less man power

V. ARCHITECTURE

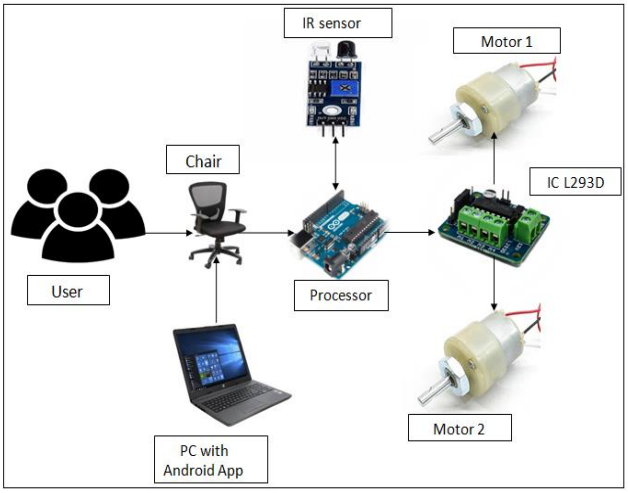

Fig1.system architecture

VI. DISCRIPTION

In this paper we have shown the concept of an automatic parking chair. As in modern world everything is going to automatic, we build a system which will automatically sense start and end points using line follower algorithm. We use microcontroller to sense the movement of chair and check whether there is proper place to park chair, and depending on data of microcontroller processor decides to park the chair or not. There are two sets of sensors: one is placed as line following sensor which gives the interrupt to the system and wheel encoder reminds the movement of chair for its real position. The use of this chair in this modern world is to reduce human efforts. For controlling purpose or providing signal to chair we design an android application. When we give command from smart phone arduino controller gives signal to chair for moving forward direction.

VII.LINE FOLLOWING ALGORITHM

1. Start
2. Read SLL,SL,SR and SRR sensor values
3. If SLL and SRR on black surface
4. If SL and SR on black surface
5. Move forward (reduce right motor speed)

6. Go to step 2
7. If SR on white line
8. Move right (reduce right motor speed to half)
9. Go to step 2
10. If SL on white line
11. Move left (reduce left motor speed to half)
12. Go to step 2
13. If SLL and/or SRR is/are on white surface
14. Not a simple line
15. Follow 90 degree turn algorithm.

VIII. MATHEMATICAL MODEL

S is the system S = {I, O, F, A, mp, mn}.
Where,
I=input data from sensor I= {i1, i2, i3... in}.
O=output data from motor O={o1, o2, o3... on}.
A=android application output A={a1, a2, a3... an}.
mp=motors positive output.
mn=motors negative output.
F=functions used in line follower algorithm.
F={f1, f2, f3 ... fn}
(Success)
f1= {mp1 and mp2 are true}.
Chair move forward.
f2= {mn1 and mn2 are true}
Chair move backward.
f3= {mn1 and mp2 are true}
Chair move towards left.
f4={mp1 and mn2 are true}
Chair move towards right.
(Failure)
f5= {mp1 and mn1 and mp2 and mn2 are false}
Chair not moving.

IX. FLOWCHART

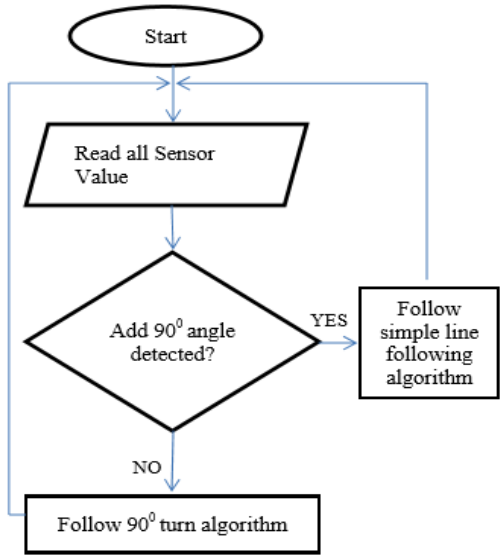

Fig2. Flowchart

X. PICTURE MODEL

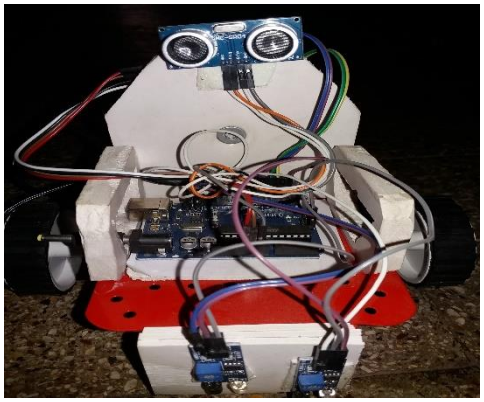

Fig3.picture of model

XI. FUTURE SCOPE

The future of the smart parking market is expected to be significantly influenced by the arrival of automated vehicles (AVs).

Self-parking chair system may use in hospitals for patient who have some physical disabilities.

As it is self-parking system it will use for many areas where automation is most important.

The main use of this system is in conference rooms and it may use in colleges or in schools to mark attendance.

XII. COMPARATIVE STUDY

1. Existing System

There are some automatic parking systems available. Which implement self-parking chair. But these systems make use of SMPS which require more voltage for work. Because of this it becomes time consuming.

2. Proposed System

In this system we are using motors and motor drivers for movement of chair. The android application used to trigger arduino processor. We use L293D motor driver because of this system works in efficient time.

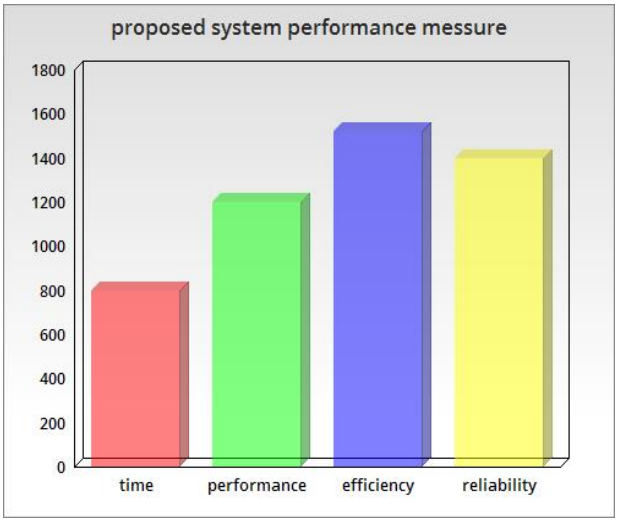

Fig 4. Flowchart

XIII. CONCLUSION

Using this system, we successfully build a self-parking chair. It is fully automated system because there is no human interference in parking operation. By using this system, we arrange chair automatically and without human resource. This system work within very less time and helps to save time.

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Cite this article as :

Auchare Manisha, Chaudhari Bhagyashri, Phadatare Supriya, Jagdale Pranita, Prof. Shubhangi Jadhav, "Android Based Self-Parking Chair for a Modern Conference Room", International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 7 Issue 5, pp. 65-69, September-October 2020.
Journal URL : http://ijsrset.com/IJSRSET207524