Smart Self-Parking Chair

Vivek Dhande[1], Nikhil Bhot[2], Renuka Gongate[3], Akshay Chandgude[4], Prof.Shobha Patil[5], Prof.Dipali Patil[6]

[1]*Student, Computer Engineering, J.S.P.M. College of Engineering, Pune*

[2]*Student, Computer Engineering, J.S.P.M. College of Engineering, Pune*

[3]*Student, Computer Engineering, J.S.P.M. College of Engineering, Pune*

[4]*Student, Computer Engineering, J.S.P.M College of Engineering, Pune*

[5]*Guide, Computer Engineering, J.S.P.M College of Engineering, Pune*

[6]*Guide, Computer Engineering, J.S.P.M College of Engineering, Pune*

---***---

Abstract - Automatic systems are design for comfort of human's. Now a day's the need of physical work is greatly reduced. Since the technologies are advancing and m-any system have been developed for automation and are being used in our day to day life such as self-aligning chairs. Our main aim to design and developed a chair that tends to Parallel Park by itself. In Conference halls, In Meeting rooms or in offices most of the peoples never arrange the chair as it is on its original position or after meeting is over. The main problem is to sometimes last user can cater the problem of finding the way through the non-arranged chairs. It consumes time and requires human effort as well as arranging the chairs for immediately after meeting is over is most time consuming task. In order to reduce this issue we have developed a chair with smart parking capability at minimal cost. Whenever chair gets a signal from application it will park automatically on its own position. The self- parking chair's whole process is controlled by using Arduino MEGA and obstacle detection is done by using ultrasonic sensor. It overcome both human efforts and time consumption in the process of decorating a conference room, Meeting rooms or in offices. Proposed system model is more cost effective and affordable than the existing systems available till date.

Keywords: Arduino MEGA, Ultrasonic sensor, L293D, Bluetooth Module, Android.

1. INTRODUCTION

The Vision-guided robotics has been one of the major technical area in the software community in past years. In the paper "Self-Aligning Chair" we offer concept of an automatic parking chair. We design a system which will sense automatically starting and ending point location of chair. The system work like robot as it is able to get signal from android application via Bluetooth module i.e., HC-05. With a single click on android application chair start toward original position. In this project we develop an android application for chair movement in forward, backward, left and right movement manually also. We use Arduino MEGA for controlling chair activity or movement of chair with the L293D motor driver module attached to chair that helps for drive from one location to another location. The communication between Chair and Android application we use HC-05 module. If any obstacle is detected in front of chair that time chair stops the working until obstacle is moves away from it. It overcome both human efforts and time consumption in the process of decorating a conference room, Meeting rooms or in offices.

2. LITERATURE SURVEY

Paper Name: Intelligent Self-Parking Chair. (2018)

• Authors: Siddharth Gauda, Ashish Panchal, Yograj Kadam, Prof. Ruchika Singh: Intelligent Self-Parking Chair.

• Description: This project is based on the inspiration of Nissan Company which develop a chair with rotating axis of 360 degree and cameras which is capturing the movement of all the movement done by the chair and gives the signal for the next action. It is an journal published by the Japanese company NISSAN in the year of 2016 by Nancy Owano the project says that the chairs swinging into action, self-guiding to reach at a table in response when a person clap's. These chairs perform reverse and turn operation. They were named "robo thrones."

Paper Name: Providing Accident Detection in Vehicular Networks through OBD-II Devices and Android-based Smartphones.

•Authors : Jorge Zaldivar, Carlos T. Calafate, Juan Carlos Cano, Pietro Manzoni

• Description: By combining smartphones with existing vehicles through an appropriate interfaceweare able to move closer to the smart vehicle paradigm, offering the user new functionalities and services when driving. In this paper we propose an Android based application that monitors the vehicle through an On Board Diagnostics (OBD-II) interface, being able to detect accidents. Our propose

Paper Name: Parking Vehicle System.

• Authors : Ms. Honghong Liu

• Description: The paper described, an RC (remote-controlled) toy car is modified by integrating the ultrasound sensors and Arduino UNO with a high current shield to control the vehicle movements and the parking processes. Parking techniques and the corresponding algorithms are explored and programmed through Arduino IDE. At the time of testing, the car is capable to move to detect the imitated "roadside" environment, judge a space suitable for parking or not, and then drive to park automatically.

Paper Name: Performance Analysis of Maximum Length LFSR and BBS Method for Cryptographic Application.

Authors: N.S.Abinaya, P.Prakasam

Description: In this paper, 8, 16 and 32 bit maximum length LFSR which can give the maximum states of PN sequence has been implemented. Also pre-sented the comparison of performance analysis of 4 bit LFSR and 16 bit BBS based on synthesis and simulation result on FPGA using hardware descriptive language(HDL) with maximum length feedback polynomial to understand the area, speed and power requirement. The target device we have used is Xil- inx Virtex6 XA9572XL FPGA and performed simulation and synthesis using Xilinx ISE 12.L. FPGA is a predesigned reconfigurable. It has the ability to reconfigure its circuitry for a desired application or function at any time after manufacturing. It is an adaptive hardware that continuously changes in re- sponse to the input data or processing environment. The FPGA configuration is generally defamed using a hardware description language (HDL), similar to circuit (ASIC).FPGAs can be used to implement any logical function that an ASIC can perform. Because of various advantages and rapid prototype development can possible, so FPGA is chosen.

3. PROPOSED SYSTEM

In our system we create a chair that move parallel get self-position itself in conference room with the help of android application for providing signal to the chair. We can use different types of interrupts to perform the further operation the interrupts can be smart phones, line follower sensor,

Bluetooth device, steeper motor etc. In this chair we will be using one L293D motor driver for input to provide signal to motor for moving towards position, which will feed data to an onboard Arduino that will control its motors, using a finite state machine. The paper is focused on achieving a single task (automatic parking) by integration of sensors and actuators controlled by microcontroller and strategy planning/coding, therefore the vehicle platform is not built from the parts but from modifying a RC toy car instead for saving the time. For performing operating we use Android application for getting back signal to chairs. The field of invention is related to Smart chair based on IoT. This electronic chair helps to automatically locate at predefined space. Since most of the time in lab/conference room, after session completed people never keeps chair at proper position. So there is need to rearrange chair after session get over which require one person/peon engaged at outside of lab/conference room at all time for every lab. Traditional way of lab arrangement is to done manually by peon which require hard-work as well as time so present invention provides new and smart way to keep chair at proper position. Present invention uses Sound sensor to check sound of clap which is instruction to rearrange chair at predefined location and weight sensor to check whether user is still sat on chair or to decide whether to rearrange or not. Smart chair uses IoT devices to find location of chair. "Automatic Self Parking Chair System" we have shown the concept of an Automatic Chair Parking System. As in the modern world everything is going automatic, we have built a system which will automatically sense the start and end point location.

4. Block Diagram
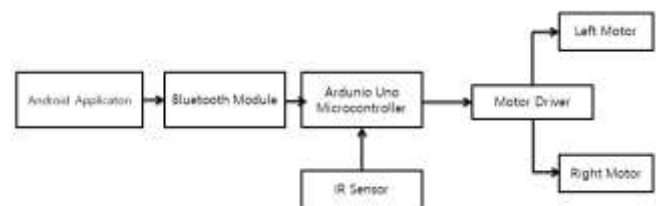
5. Algorithm

Line Following Algorithm: -

Line follower algorithm having the ability to detect and follow a line using on board hardwired control circuit]. Now a day, to reduce human effort and ensure efficient automatic transport system line followers are becoming popular. Especially in industrial areas, these are using in large number. This methodology is very easy to implement, and also efficient.
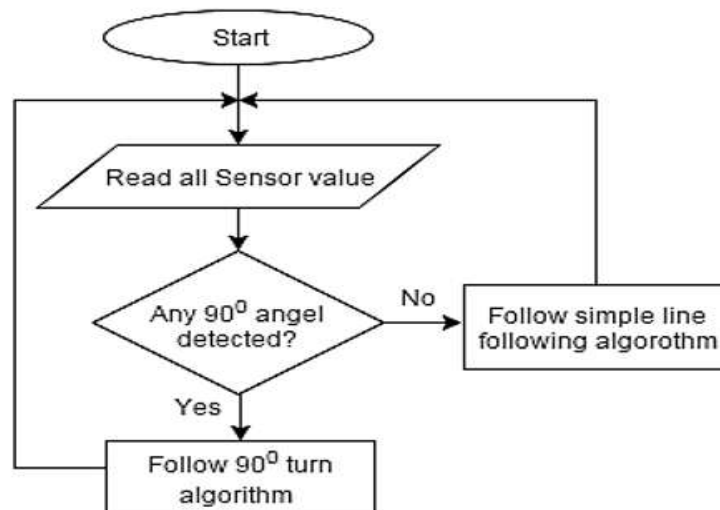
6. CONCLUSION

We developed low cost self-aligning chair is based on the Android application. The proposed system detects the space clearance and waits for obstacle clearance to move to its desired location. This system can be design in such a way that if it detects any obstacle it can alter the position by using Android application and reach the destination without waiting for obstacle clearance. This system automatically parks the shuffled chairs to their respective position with the 360 degree rotation in certain condition. By employing this automation, the chair adjustment can be done in different way as per the analysis through programming and can perform a smooth and efficient aligning behavior according to the relative positions of the chair and the parking space. The proposed system has the great advantage of being less expensive so that it is useful to the firms of all level. Since the system is simple monitoring of framework operation is quite easy. The self-aligning chair finds line locating its parking position in certain situations, so it may be useful for future work. This application leads to the development of automation in furniture and will be included in the robotics.

7. REFERENCES

[1] SiddharthGauda, Ashish Panchal, YograjKadam, Prof. Ruchika Singh-Intelligent Self-Parking

[2] Self-parking chairs at conference tables show Nissan's auto push by Nancy Owano (2016, February 15 and retrieved 23 February 2018)

[3] Ms. Hong Hong Liu- Automatic Parking Vehicle System (ASEE's 123rd Conference and Exposition-2016)

[4] DhirajThote, HarshaTembhekar, AnkitBharambe, AnkitBansod, MayurMeshram, PrajitMeshram-Automatic Self-Parking Chair (IRJET-2018)

[5] Fahim Anzum1, Fahim Ahmed2, M. Shariful Azim3, MosaddekHossain, ShifatZaman, FarhanHasib, Sazid Al Ahsan, Military Institute of Science and Technology (MIST), "Smart Self Position Aligning Chair for a Modern Conference Room."

[6] Sahil Singh Sodhi, Akash Singh Kunwar, Karan Dhingra School of Computer Science and Engineering"Smart Chair".

[7] "Internet-of-Things Based Smart Resource Management System: A Case Study Intelligent Chair System"Jing (Selena) He1 Department of Computer Scienc