IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

AUTOMATED CAR PARKING SYSTEM USING MICROCONTROLLER

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Abstract: The development of autonomous parking technology has grown in popularity as a crucial element of intelligent car technology. Automatic parking technology can efficiently and safely accomplish parking tasks without a driver, enhance driving comfort, and significantly lower the risk of parking accidents. This study suggests an automatic parking system based on parking scene identification to address the following problems with current automatic parking systems: Methods for recognising parking scenes are less sophisticated, vehicle control is not very automated, and the research is only focused on conventional fuel vehicles. Machine vision and pattern recognition algorithms are used to intelligently recognise a vertical parking scenario, plan a reasonable parking path, and develop a path to maximise the utilisation of parking spots and parking convenience.

Keywords – Automatic parking, IR Sensors, Microcontroller, LCD, Rack and pinion

1. INTRODUCTION

Any city has the world's densest population, which is particularly obvious in the capital cities..People must suffer, and significant time is lost as a result of this persistent problem. Unplanned stoppages or parking, different speeding vehicles on the same road, excessive population, limited road space, and improper city planning are only a few examples. accountable for the traffic congestion. Automatic rotary parking system is the most effective and appropriate due to Compared to other systems, it uses less space. Due to the inefficiency of the current parking system. Due to new technology there will be less congestion in the traffic
in a notable manner. Less land is required for this parking system since it utilises vertical space rather than horizontal area.
used. As the engines are turned off while the car is being transferred, no air pollution occurs with this system. Since 020026-7 is not audible, making the use of this parking method extremely ecologically beneficial. Additionally, this method is automatic, and it is simple to observe where the needed car is parked. One of the drawbacks of wireless technology is GSM-based multi-level parking is predicated on the idea that hackers might access the software of the car and alter or control it. Operation, which poses a significant security risk. This issue arose because we used a password instead of WiFi or GSM.[1]

Today, more and more multi-story buildings are being built on a daily basis, which has led to an increase in vehicle parking.
issues. Consequently, there is a land shortage, which results in the removal of trees. This has a severe and negative impact on
the surroundings. The goal of this initiative is to preserve ground space,necessary for parking. Utilizing the parking system, several
Vehicles can be parked in accordance with the requirements.Using a microcontroller-based car parking system,parking of automobiles by showing the open spaces and thereby limiting the amount of parking that people use. This is where
parking method allows for the parking of any number of vehicles.The system is incredibly contemporary and a perfect fit for the purpose conserving space. [2]

With increasing vehicle sizes in the luxury category as well as sport utility vehicles, parking has been and continues to be a challenge. This is especially true when you consider how small parking spaces are in cities and parking lots. While parking-related harm normally does not harm the passengers, but it is expensive and inconvenient. aid in parking systems on the market are by no means new, since passive systems that give longitudinal For a lot of years, ultrasonic distance sensors have been used for steering.
of time. A semi-automated solution to parallel parking issues is provided by the system appear commonly in cities in Europe and Asia.The difficulty encountered in the creation of this system was to have as few components as possible. attempting to reuse as many of the previously-integrated functionalities that are currently there in a conventional car. As a result, the system abandons the longitudinal controlling the car while automating the steering and even stopping the as you arrive at the ideal parking spot for your vehicle. [3]

The development of automatic parking technology has grown in popularity as a crucial element of intelligent vehicle technology. Automatic parking technology can efficiently and safely complete parking tasks without a driver, enhance driving comfort, and significantly lower the risk of parking accidents. This study suggests an automatic parking system based on parking scene identification to address the following problems with current automatic parking systems: The research only covers traditional gasoline cars, parking scene identification methods are less sophisticated, and vehicle control is not very automated. Machine vision and pattern recognition algorithms are used to intelligently recognise a vertical parking scenario, plan a reasonable parking path, and develop a path to maximise the utilisation of parking spots and parking convenience..[4]

Controlling the number of cars in a parking space, keeping an eye on traffic in and out, determining whether there is room inside for more cars, and parking safely are all issues with car parking. The purpose of this project is to address these issues by developing a

microcontroller-based system for managing the parking lot. The microcontroller functions as a programming tool to control the entire system, to lower the cost of requirements like job opportunities and to boost security. Additionally, this system can satisfy market demands and is quick and versatile..[5]

1.1 CONCEPT

This work has demonstrated the idea of an automatic parking system. In the modern world, everything is automated because we have created a system.which can recognise the entrance and exit automatically of vehicles through the gate, then show the how many vehicles are parked there.The time it takes to park a car is shorter because to Use the map to look for any automobiles in the area Parking spots are shown on an LCD panel.employing infrared (IR) sensors that have been placed at the entry and departure.This project makes use of Microcontroller 89c52.

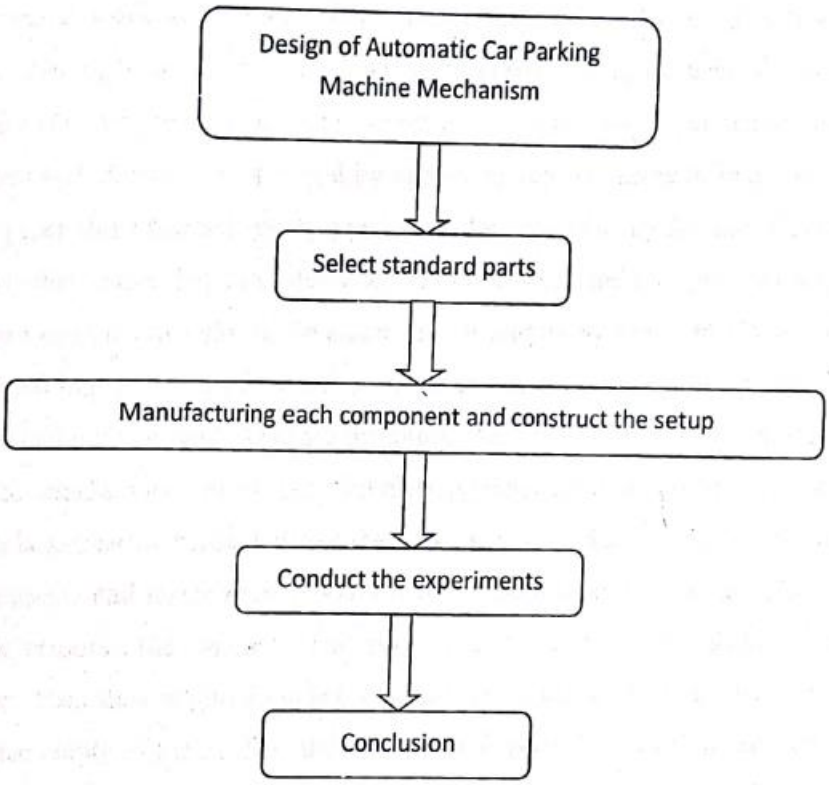

Fig. 1.1.1 Research methodology

2. THEORETICAL BACKGROUND

Nowadays there are more and more multi storey buildings are soringing up every day, thus giving rise to parking problem. Therefore limitation to land use leads to cutting down trees which creates lot of environmental issues. This work primarily focus on saving the ground space of parking using display the available slots. This will also reduce parking space required usually.

Whenever a car is placed on the pick platform the LCD will display empty space with the help of infrared sensors and microcontroller operated by motor. These operate motor to specific platform to the vehicle and space available. The pickup platform will return to initial position. Now the 89S52 Microcontroller decrements the value of count accordingly.

2.1 SETUP DESCRIPTION

The system is fully operated automatically. It includes circular structure platform made from material cast iron, rack and pinion arrangement, two pulleys, rope, six infrared sensors , # Dc motors, step down transformer, microcontroller , relays , limit switches, 12 V battery.

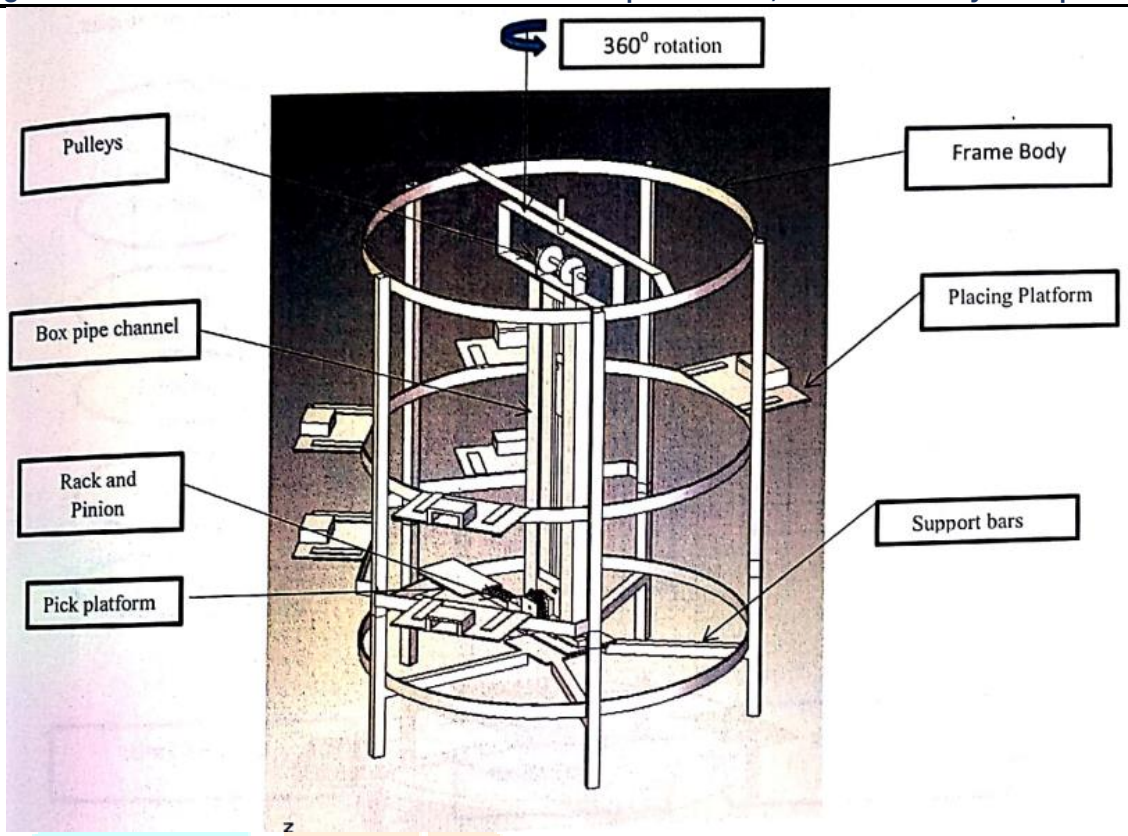

Fig. 2.1.1 Setup of frame

3. LCD DISPLAY

Alphanumeric displays are used in a wide range of application, including palmtop computers, processors,photocopier etc. It is available as optional extra is the serial LCD firmware, which allows serial control over display. All LCD commands are transmitted serially via a single microcontroller pin.

Fig. 3.1 LCD Display

4. MICROCONTROLLER

A CMOS 8-bit microcontroller with low power consumption and high performance, the AT89S52 has 8K bytes of internal programmable flash memory. The product is made with high-density nonvolatile memory technology from Atmel and is pin-compatible with the 80C51 instruction set, which is the industry standard. The programme memory can be updated in-system or using a typical nonvolatile memory programmer thanks to the on-chip Flash. The Atmel AT89S52 is a potent microcontroller that offers a highly flexible and economical solution to many embedded control applications by combining an adaptable 8-bit CPU with in-system programmable Flash on a monolithic chip.

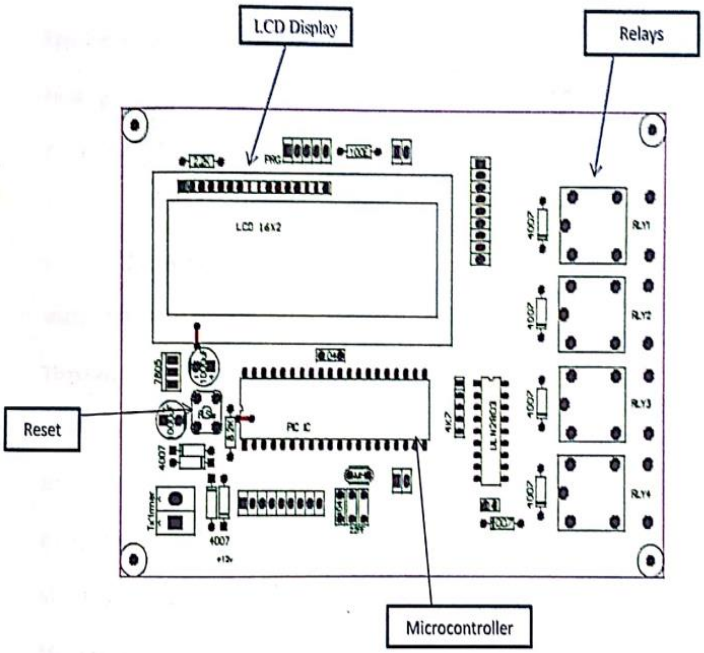

Fig. 4.1. Circuit diagram

4. RESULTS AND DISCUSSION

A lift mechanism is used to park the car on the first floor using motor. As motor rotates clockwise it get stopped when reaches on first floor as car is parked accpording to priority basis. When all cars parked on first floor lifter moves on second floor using motor and rest operation is same. When all cars parked on both floors i.e. no further space available display shows no space.

4.1 SIGNIFICANCE IN TERMS OF APPLIOCATION

- Space can be properly utilized by commercial entities
- Vehicle is safe in parking spot
- Reduced labour and resource cost as automation is introduced
- No need of rampways and driveways
- Significant saving in time

5 CONSLUSION

Automatic Multi stored car parking system is very good substitute for car parking area. This automated car parking system enables the parking of vehicles and thus reduces the time taken to check the space to be used by displaying the spot where the space for parking is available on an LCD display by using IR sensors at the empty platform. This automatic car parking enables the parking of vehicle around 360^0 thus consuming less space than ordinary parking system. The system is flexible, safe and requires less human interact.

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