



Review On Fifth Wheel Car Parking

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Abstract :

Parallel parking is a method of parking a vehicle in-line with other parked vehicles. Parallel parking requires initially driving slightly past the parking space, parallel to the parked vehicle in front of that space, keeping a safe distance, and then followed by reversing into that space. Subsequent position adjustment may require the use of forward and reverse gears. Parallel parking is considered to be one of the hardest skills for new drivers to learn. Parallel parking enables the driver to park a vehicle in a smaller space than would be true of forward parking. Driving forward into a parking space on the side of a road is typically not possible unless two successive parking spaces are empty. Reversing into the spot via the parallel parking technique allows one to take advantage of a single empty space not much longer than the car in order to complete the parking within three wheel-turns the parking space would generally need to be about one and a half car length long.

Keywords: Parallel parking , Pneumatic system, Boot space, Pivot point, Automotive sector

1. Inroduction

The work on parallel parking of car using fifth wheel according to, Parallel parking is the method of park the vehicle parallel in between the two vehicle keeping the safe distance. They developed a system by introducing a fifth wheel at the rear side of the vehicle. The pneumatic system is used as a jack to lower the wheel and lift the vehicle from the rear side. The prime mover is used to provide a power to the fifth wheel and for forward and reversed rotation is also done by motor. Firstly, the driver places the vehicle at an angle from the front. As soon as the driver pushes the button the wheel is goes downwards and vehicle lifted up from rear side. The prime mover gives the rotation to the wheel as per the requirement (Forward or Reversed) and the vehicle park in between the vehicles. For this system they implement a digital display to indicate the status of the fifth wheel done the work on fabrication of parallel car parking, using 5th wheel according to his study, In earlier methods of parking, the time taken is 2 minutes (approx), the driver needs to be more alert while parking in order to avoid hitting of the car during the reverse motion. Therefore, to avoid these inconveniences, a concept of parallel parking is made, where the total time will be 50 to 60 seconds. This parking can be done using an additional wheel, a pneumatic cylinder and solenoid valve set up is used to control fifth wheel to land and lift. A DC motor enables the forward and reverse motion for the fifth wheel. A digital display is used to indicate the status of the wheel for the driver reference. It also helps to know malfunctions during landing or lifting of the wheel. This concept is mainly used for four-wheeler vehicles. This setup makes the vehicle to turn parallel in a significant angle with reference to the front axle within a short period. The model enables the driver to park the vehicle between two vehicles, where the space is limited. This is carried out by us made an impressing task in four wheelers. It is very useful for parking four wheelers, because they need not take any risk for park the vehicle and quick operation. This project will reduce the cost involved in the concern. Project has been designed to perform the entire requirement task at the shortest time available fifth wheel according, parallel parking is a method of parking a vehicle in-line with other parked vehicles. Parallel parking requires initially driving slightly past the parking space, parallel to the parked vehicle in front of that space, (hence the term 'Parallel Parking'), keeping a safe distance, and then followed by reversing into that space. Subsequent position adjustment may require the use of forward and reverse gears. Parallel parking is considered to be one of the hardest skills for new drivers to learn. Parallel parking enables the driver to park a vehicle in a smaller space than would be true of forward parking. Driving forward into a parking space on the side of a road is typically not possible unless two successive parking spaces are empty. Reversing into the spot via the parallel parking technique allows one to take advantage of a single empty space not much longer than the car (in order to complete the parking within three wheel turns the parking space would generally need to be about one and a half car-length long). The is carried out by us made an impressing task in four wheelers. It is very useful for parking four wheelers, because they need not take any risk for park the vehicle and quick operation. This project will reduce the requirement of time & effort task during parking of vehicle.

The work on, Design and Fabrication of an Automated Multilevel Car Parking System, according to his study, in this paper, the basic multi-level car parking system with three floors is considered to show the use of

control systems in parking systems. The control system will play a major role in organizing the entry to and exit from the parking lots. It also presents the design of multi-level parking lots which occupies less need on the ground and contains the large number of cars. In the modern world, where parking-space has become a very big problem, it has become very important to avoid the wastage of space in modern big Automatic multi-level car parking system helps to minimize the car parking area companies and apartments. The parking lots have an elevator to carry cars to different floors according to the vacancies. The elevator is controlled by a programmable logic controller (PLC) along with the help of some sensors. The multi-level car parking system had successfully been designed and developed. The control strategy for the traffic flow to the multi-level car parking system was carried out using the PLC. The PLC with the help of some sensors checks the availability of the vacant place on each floor. It can be noticed that the control system for the multi-level car parking system has achieved the anticipated performance to regulate the entry and exit of the car to/from several floors accurately. The movement of the elevator between the floors was continuous and smooth as requested. The number of entering and existing car from all the three floors was controlled as per the signals from the sensors on each floor at the entry and exit point. The entry and exist phases of the cars depends on the availability of the elevator and the time required for exist. The preference for the entry will be for the car that is present at the stopping in front of an elevator at the ground floor. Meanwhile, the preference for exist from other floors will depend firstly on the space and secondly on the time demanded for exist. Introduction to vertical multistage car parking system according to his study, In metropolitan cities, vehicle parking has become a major concern in all busy areas and a good traffic system needs a good parking system. Different types of vehicle parking are applied worldwide namely Multi-level Automated Car Parking, Automated Car Parking System, Volkswagen Car Parking, vertical car parking etc. Parallel parking is challenge for all drivers say amateurs or the experts. A multistage car parking system is a solution to this ordeal. This paper explains in detail a simple and precise multistage car-parking introduction, advantages, characteristics, etc. This paper give the information to develop a reduced working model of a car parking system for parking 6 to 24 cars within a parking area of 32.17 m². The chain and sprocket mechanism is used for driving the parking platform and a one fourth hp brake motor shall be implemented for powering the system and indexing the platform .The platform is fabricated to suit. Vertical Car Parking model has been designed; all the parts in it were manufactured and assembled and tested successfully. Analysis of the model has been done and developed with the scaling of 1:9 for life size model Such as SUV's like fortuner. As the life cycle model involves proper design and advanced methods are to be used to meet the requirements of the customer. Quick Automated Parking and retrieval of vehicles. Up to 12 cars can be easily and safely parked. Surface space required equivalent to just 2 surface car parking spaces. Most suitable for Staff or dedicated user parking. Engineered to ensure Driver safety by use of an electronic Safety zone. Low maintenance levels required by the system.

Roads that facilitate parallel parking have an additional lane or an outsized shoulder for put cars. It's also used whenever parking facilities aren't accessible typically in giant metropolitan areas wherever there's a high density of vehicles and few (or restricted) accommodations like multi- keep automobile parks. Some

jurisdictions have eliminated individual spots permitting shorter vehicles to use less area. Parallel parking could be a methodology of parking a vehicle in-line with different put vehicles. Parallel parking needs at first driving slightly past the auto mobile parking space, parallel to the put vehicle before of that area, keeping a secure distance, and so followed by reversing into that area. Later position adjustment could need the utilization of forward and reverse gears. Parallel parking is taken into account to be one in every of the toughest skills for brand new drivers to be told. Driving forward into a parking space on the side of a road is typically not possible unless two successive parking spaces are empty. Parking system: A car parking system is a device that multiplies parking capacity inside a parking lot. Parking systems are generally powered by electric motor or hydraulic pumps that move vehicles into a storage position

So, let's step back in time to consider a nifty innovation that made it much easier to squeeze into a tight spot. Back in the 1950s, a man named Brooks Walker invented "fifth wheel driving," wrote Old Cars Weekly. The system utilized a hydraulic pump and the car's spare tire to guide the vehicle in and out of parking spaces. It could also turn the car in a complete circle. Walker created a prototype on his own Packard Cavalier. (He was from the San Francisco Bay Area, where the steep streets can make parallel parking especially tricky.) Walker demonstrated "fifth-wheel driving" at numerous auto shows. "With new cars getting bigger and parking spaces getting smaller an inventor has developed something to soothe the motorist's headache," a newsreel narrator enthused. But the big car companies didn't jump on the bandwagon. The inventor apparently spent the next 20 years tinkering with the idea, with the ultimate goal of making the system "a bolt-on kit that could be applied to any car without changes to its basic structure," Old Car Weekly wrote. Watch the video below to see how Fifth-Wheel Driving worked. Before long he was making the rounds again, this time demonstrating his park assist device on a 1953 Packard Cavalier and taking advantage of an extended continental kit to mount the fifth wheel outside the trunk. Using a series of gears and hydraulic pumps and lines, Walker's system could be activated with the push of a button beneath the dash. Surprisingly, Detroit said no again. Walker continued to perfect his parallel parking system into the 1970s, but he died without ever realizing his dream—a dream that is now reality. So, the next time you take your hands off the wheel of your Chevy Malibu as it methodically parallel parks itself, give thanks for Brooks Walker

2.Literature Survey

Meghraj Gadhavel and et al., (2021) presented the time taken is 2 minutes; the driver needs to be more alert while parking in order to avoid hitting of the car during the reverse motion. Therefore, to avoid these inconveniences, a concept of fifth wheel parking is made, where the total time will be 50 to 60 seconds. This parking can be done using an additional wheel fifth wheel. A screw is used to control fifth wheel to land and lift. DC motor enables the forward and reverse motion for the screw. It also helps to know malfunctions during landing or lifting of the wheel. This concept is mainly used for four-wheeler vehicles. This setup makes the vehicle to turn parallel in a significant angle with reference to the front axle within a short period. The model enables the driver to park the vehicle between two vehicles, where the space is limited.

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Dr. A. P. Sivasubramaniam and Dr. M. Makesh, (2022) presented the Parallel parking is a method of parking a vehicle in-line with other parked vehicles. Parallel parking requires initially driving slightly past the parking space, parallel to the parked vehicle in front of that space, (hence the term 'Parallel Parking'), keeping a safe distance, and then followed by reversing into that space. Subsequent position adjustment may require the use of forward and reverse gears. Parallel parking is considered to be one of the hardest skills for new drivers to learn. Parallel parking enables the driver to park a vehicle in a smaller space than would be true of forward parking. Driving forward into a parking space on the side of a road is typically not possible unless two successive parking spaces are empty. Reversing into the spot via the parallel parking technique allows one to take advantage of a single empty space not much longer than the car (in order to complete the parking within three wheel-turns the parking space would generally need to be about one and a half car length long).

Vaibhav Channewadkar and et al., (2021) presented the methods of parking, the driver would take to be more time as well as alert while parking in compact spaces avoid hitting of the vehicle during the movement of vehicle. The parking is a big problem in the big cities due to congestion of roads and traffic regulation and if it is an unskilled driver it will be a big problem to the other drivers also maximum time is needed for parking. Therefore to avoid these inconveniences, a concept of parking is developed for taking least time for parking and aim of this system is to fold the auxiliary wheel for better space adaptability also placed in boot space. This parking can be done using an additional wheel (an Auxiliary Drive Wheel) most probably this will be a Stepney wheel. Initially, when the driver finds a slot for parking, he pushes the button and the DC motor actuate the movement of rack and pinion. Rack and pinion will applied force on the one side of triangular hub and due to the pivot point the triangular hub move in angular moment and other side of triangle will lift auxiliary wheel. This will land the auxiliary wheel on the road and slightly lifts the rear side of the vehicle. A rack and pinion and triangular hub set up is used to control an Auxiliary drive wheel to land and lift. The model enables the driver to park the vehicle between two vehicles, where the space is limited.

Mr. Paresh G. Chaudhary, and et al., (2018) presented the One of the main problems of the collaborative mobile robot application is to share the exact information of the robot itself and the surrounding area. Each robot needs to maintain its stability and positioning in order to achieve the target. As one of the samples of achieving the positioning task, a parallel parking problem was used in this paper. This paper used a car-like robot to do a parallel parking task. Front wheels were steered by using a connected joint and a servo motor. Meanwhile, each of the rear wheels was connected to a motor DC. Four ultrasonic sensors were used to find the distance between the robot and its surrounding (fixed in front, back, middle right, and middle of right -

back side). The sensors connected to an Arduino Uno as the main microcontroller. The robot used a positioning algorithm based on the distance to nearest objects. The robot is designed only for parking on the right side of the car with an assumption there is no obstacle in the left side of the car. The experimental results confirmed that our system can solve the parallel parking problem. However, during the test, the output of the sensor was were affected by the noise from the environment. Another problem was the robot hardly to move straight because the rubber tires were not installed neatly. In the future works, the data output needs to filter and corrected and the servo degree needs to be initially corrected based on the chassis and tires angle.

3.Problem statement :

In automobiles, parking system is complicated and time taking to park the vehicle, needs to be more alert while parking in order to avoid hitting of the car during the reverse motion. Therefore, to avoid, a concept of fifth wheel parking is made.

Objectives:

- i. To understand the basic principal of the our project
- ii. Describe the construction and working of various parts of our project
- iii. Development of the working model of the our project
- iv. To reduce time spent on this activity.
- v. To analyze the technology according to needs and capabilities

Advantages:

- i. Easy Maintenance
- ii. Change in mode is Easy
- iii. Applicable in every 4 wheeler
- iv. To obtain better parking in narrow space and at multiplexes.
- v. To obtain 0 to 360 degree turning with zero turning radius.
- vi. Resolve Traffic Problems.
- vii. Vehicle parking and driving in city conditions with heavy traffic in tight spaces.
- viii. This type of car can be taken through traffic jam.
- ix. Saving of Time.

Disadvantages:

- i. Additional wheel is required
- ii. Extra space is required
- iii. Less boot space

Application of project:

- i. Used for easy parking in four wheelers
- ii. It is applicable for all four wheeled vehicles.

Future scope:

- i. Aim for development of a system to useful in the automotive sector.
- ii. Four bar mechanism will be implementing for working of fifth wheel, our aim is to fold the fifth wheel axel for better space adaptability.
- iii. Hence whenever needed operated must have unfold the fifth wheel axel by actuating rack and pinion.
- iv. Arrange conventional steering system at front side

Conclusion:

The project carried out by us made an impressing task in the field of automobile industries. It is very usefully for driver while driving the vehicle and parking the vehicle. This project has also reduced the cost involved in the concern. Project has been designed to perform the entire requirement task which has also been provided. A vehicle featuring low cost and user-friendly steering mechanism for Auxiliary wheel has been introduced. This paper focused on a steering mechanism which offers feasible solutions to a number of current maneuvering limitations. A prototype for the proposed approach was developed by introducing separate mechanism for normal steering purpose and 360-degree steering purpose. This prototype was found to be able to be maneuvered very easily in tight spaces, also making 360° steering possible.

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