Smart Car Parking System Using RFID Sensor (IOT)

[1]Prof. Mrs. R. V. Humane, Mr. Prajwal R. Umak[2], Mr. Sangharsh S. Sonarkar[3], Mr. Dhiraj S. Wanjari[4], Mr. Anish A. Gund[5], Mr. Dipanshu R. Jiwane[6], Mr. Sanket C. Barsagade[7]

[1,2,3,4,5,6,7] Department of Electrical Engineering, Priyadarshini J.L. College of Engineering, Nagpur, Maharashtra India
[1]deodhe@gmail.com, [2] prajwalumak22@gmail.com, [3] sangharshsonarkar@gmail.com, [4]dhirajwanjari84@gmail.com, anishgund94@gmail.com[5], dipanshujiwane@gmail.com[6], barsagadesanket777@gmail.com[7]

ABSTRACT —

Car parking is a major issue in large cities in various locations. There are many consequences and considerations for parking issues, but you can see that with the help of an RFID device, parking results will occur. Intelligent Reserve Systems Using RFID are the result of an extended (radio frequency identification) for managing parking spaces using RFID technology. This system allows drivers to use RFID markers to reserve and drive parking spaces safely and accessible. The system uses RFID Compendia to identify and track the location of marked vehicles, allowing drivers to find available parking spaces without issue. The data stored in the algorithm allows for entry/output of vehicles that are not permitted to be entered/output. The system offers similar benefits, including improved security, reduced business transactions, and improved stoner experience. It also provides Parker with real data and analysis, optimizing parking operations and generating profits. Despite some challenges related to the facts of RFID technology, the benefits of the Smart Reserve Pare Park system have promising results for managing parking spaces in colorful environments, including purchasing citizen areas, airfields and promnade.

Preface

RFID-heard Automatic Parking System is designed to provide an effective parking lot with Arduino and RFID technology. Just like in the ultra modern world, everything is automatic, and it builds a system that automatically sniffs the entries and outputs of buses passing through the gate, as well as the number of buses in the parking lot. Checks and checkouts are handled quickly without stopping the bus, so that business jam issues are avoided during these processes. This developed technology can be used in all bourgeois areas where automatic parking is the most common. Some of the heavy companies that can install and use this design are shops, hospitals, airfields, cinemas, apartments, and more. Land costs are increasing exponentially in large cities. Therefore, it is important that the parking spaces require the lowest possible location and absorb the maximum vehicle quantum. Through this design, we develop a parking system for automated parking systems for stylish use of the square..

Literature Survey

Vijay Paidi, Hasan Fleyeh, Johan Haìkansson and Roger G. Nyberg published a paper (4) in 2018, titled "Smart Parking Treatment, Technology, Open Parking Lot Technology, Operations" (4). The newspaper author proposed intelligent park detectors, technology and operations for open parking spaces. This study suggested a mechanically ingested, foldable folding network and multi-agent system suitable for open parking spaces, which has been proposed for resistance to various environmental conditions. Open parking reservations are not possible, making it sensitive to oiling the driver when deciding on choosing a parking space.

- **Arduino Uno**

 [1] Karma Tsheten Dorjee, Deepak Rasaily, Bishal Cintury, RFID-grounded car parking system, Microcontroller, Ijett Volume 32, Number 4, 2016 Arduino UNO has an AVR microcontroller-ATMEGA328, six analog input legs and 14 digital E/A legs, six of which are used as PWM incidents. This card includes a USB interface. H. USB strings are used to connect the board to a computer and program the board into Arduino IDE (Integrated Development Environment) software.

- **RFID Module**

[4] R. Kannadasan, A. Krishnamoorthy, N. Prabakaran, K. Naresh, V. Vijayarajan, G. Sivashan Mugam, Introduction and Applications of RFID-based Automated Parking Systems, Australia, Lores, Volume 10 (2), Runners 186 191, February 2016. - Frequency or Radio Frequency - Frequency or Radio Frequency or Radio Frequency or Radio Identification System, Two Key Factors, February 2016. "Object links and transceiver, also known as interrogators/anthology, consists of electromagnetic frequency modules and antennas that generate electromagnetic high-frequency fields..

- **IR Detectors**

[3] S. C. Hanche, Pooja Munot, Pranali Bagal, Kirti Sonawane & Pooja Pise, Automobile Parking System with RFID, ISSN (printed) 2320-8945, Volumen-1, Output-2, 2013. The dissatisfied IR detector is referenced. The emitter is simply an IR LED (light diode), and the sensor is simply an IR photodiode, and is sensitive to IR lights of the same wavelength as the issued IR LED. If Ir-Leithle is a photo diode, the resistance and tension in question will change in relation to the size of the input IR light.

- **Servo Motors**

[7] Ranxin Way; Qisheng wu; Mayyan; White Things; Bo Li; RONG GAO designs and perpetrators of intelligent parking systems based on RFID and the Internet, Runner 17-20, 2012. The servo engine is mainly composed of a DC engine, which is controlled by a variable resistance (potiometer) and several gears.

[8] Eirini Eleni Tsiroopoulou, John S. Baras, RFID Ground Smart Parking Operations System, Taylor & Francis, 2018, ISSN 2333-5785. Servo motors are a type of engine that can rotate perfectly. In principle, this type of engine consists of a control switch that provides feedback regarding the current position of the motor shaft. With this feedback agent, the servo motor can rotate with very accurate accuracy. Also, if you want to rotate an object at a specific angle or distance, use a servo motor. It consists of only a simple engine that flows through servo media.

- **TV Display**

[4] M.Y.I. Idris, Y.Y. Leng, E. M. Tamil, N. M. Noor, Z. Razak, Auto-Demesne System Intelligent Parking System and Its Technology Journal, 2009, ISSN 1812-5638, "Electronic devices used to display data.

Methodology

Our designs focus primarily on the principles of spare parking spaces for licensed vehicles and can be implemented directly in universities (for professors and employees), hospitals, MNCs and other government-like towns. and private associations.

1. Problem-Analysis

Uncertain parking spaces often lead to unfortunate spaces, which can damage each other. Insufficient parking affects traffic and driver frustration. A situation arises that is called seeing a vehicle blindly obey other vehicles without proper identification. Most of the time goals are open, which leads to the intrusion of all kinds of vehicles within the demesne. Safety personnel are ineffective in enabling critical vehicles in demesne for proper identification systems. The gate opening system is homemade and depends on the emptiness of the guard.

2. Element Selection

- **Arduino Uno**:
- Microcontroller: ATmega328P
- Operating Voltage: 5V
- Input Voltage (recommended): 7-12V
- Input Voltage (limits): 6-20V

- **RFID Technology**:
- Operating frequency: 125KHz RFID module
- Operating voltage: 4.5V to 5.5V
- Current Consumption: 50mA
- Operating Temperature: 0 oC to +80 oC
- Range: Up to 5cm

- **IR Sensors**:
- 5V DC Operating voltage
- Range: Up to 5cm
- Dimensions: 48 x 14 x 8 mm
- 20mA supply current

- o **Servo Motors**:

- Operating Voltage is +5V typically

- Torque: 2.5kg/cm

- Operating speed: 0.1s/60°

- Gear Type: Plastic

- Rotation: 0°-180°

- Weight of motor: 9gm

PROPOSED RESULT

This design is designed so that only valid workers can access Demesne using a valid RFID card. The proposed automated parking system uses RFID anthology at the entrance to recognize certified vehicles and distribute available parking spaces to the vehicles. The system easily displays available parking spaces, shows committed and unoccupied locations on the display card, allowing stoners to check locations before entering the parking lot, allowing cars to be placed in this niche without wasted time. Parking spaces are continuously covered and data is continuously optimized with display cards. Any entries that are not permitted will be denied access to the parking system.

WORKING OF THE SYSTEM

The circuit diagram through the construction of a smart parking system earned with RFID with the Arduino Uno Show is specifically accessed only by the RFID card. If the circuit is on, the information about the emptiness of the location played on the TV display is. However, the Arduino allows the car to sit in a secure area if the card number matches the number stored in the database. With the help of IR detectors located in all niches, information about the location of the TV display is displayed. Welcome communication with the cardholder's name will also be displayed on the TV display. When the car is in, information about the availability, i.e. H. A free niche number displayed on the TV display. Once the car leaves the parking lot, there is another RFID anthology and an exit gate, supporting several entries on one card. This prevents the vehicle from entering the starting side. When the car leaves the parking lot from the output, the number of available locations is optimized and the same location is displayed on the TV display.

FUTURE COMPASS

The fetal compass of the Smart Reserve Parkes system with RFID technology is relatively promising, with many implicit advances and advances on the horizon. Included in important areas of fetal development.

- Integration with Smart City Systems

- Integration with Autonomous Vehicles

- Use of AI and Machine Learning

- Integration with Mobile Payments

- Environmental Monitoring

REFERENCES

1] Jhonathan J. Barriga, Juan Sulca, and Jose Luis Leon, "Smart Parking : A Litreture Review from Technological Prespective", Applied Sciences, 2019.

[2] Fadi Al - Turjman , Arman Malekloo , " Smart Parking in Iot- enabled cities; A survey", Elsevier , 2019.

[3] Llogari Casas Cambra , Gerard Herrera Sague , "Creating An Interactive Mirror Experience through Web Technologies" , International Journal of Scientific and Research Publications, 2015 , ISSN 2250 - 3153.

[4] M.Y.I. Idris, Y.Y. Leng, E.M. Tamil, N.M. Noor and Z. Razak, " Car Park System: A Review of Smart Parking System and its Technology", Information Technology Journal, 2009, ISSN 1812-5638.

[5] Hongwei Wang, M.S., "Reservation Based Smart Parking System" ,University of Nebraska, 2011.

[6] L.Mainetti, L.Patrono, M.L.Stefanizzi, R. Vergallo, " Integration of RFID and WSN Technologies in a Smart Parking System",University of Salento Lecce Italy, 2017.

[7] Eirini Eleni Tsiropoulou, John S. Baras, "RFID-based smart parking management system" , Taylor & Francis, 2018, ISSN 2333-5785.