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Design and Implementation of Automated Car Parking System using RFID

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Abstract: Present industry is increasingly shifting towards the field of automation. This Project proposes an idea on the development of car parking system with its improved successful parking. It is an innovative payment system that provides the ultimate solution for drivers, municipalities and private parking lot owners. Simple and cost effective to implement, this project acts as a standalone system or alongside traditional parking payment systems to eliminate fraud and reduce cash handling.

Keywords: Smart parking system, RFID, H bridge circuit, sensor circuitry.

I. INTRODUCTION

Due to the surge in urbanisation, the usage of the automobiles has increased which in turn, has led to traffic and parking difficulties. The most widespread solution to this problem, is to increase manpower to handle such traffic. Even it is increased, the probability of traffic less parking is not completely controlled. As per recent survey more than 30% of traffic congestion are due to the search for vacant parking space. Hence there comes the need for the usage of automated car parking system. There are many methods used in the automated parking like Zigbee [9], wireless sensor network [7], microcontroller. All this methods has some merits and demerits.

II. LITERATURE SURVEY

Based on the research, the car parking has been classified into four types. They are:

1. Wired parking:
2. Wireless parking
3. Counter based parking
4. Image based parking

Wired Parking:
Wired parking is using detection sensors such as ultrasonic sensors [4] which are installed at parking lot. These sensors are wired to a central control unit that store and manage the occupancy information.

Wireless Parking:
With the advancement in the wireless technologies [3], wireless based methods have been employed in parking guidance systems. These systems are deployed and there are operated by the android[2] phone. They make use of the slot allocation algorithm and Parking management System.

Counter based Parking:
They use sensors to count the number of vehicles entering and exit a car park area. This can be gate arm counters[1] and induction loop detectors located at the entrances and exits. They can give information on the total number of vacant lots in a closed car park area, but does not help much in guiding the driver to the exact location of the vacant lots.

Image based Parking:
Image based Parking [5] sometimes called as video sensor techniques are used to capture the images at the parking lot and provide the information based on the image. There are arguments concerning the viability of using this technique.

III. PROPOSED WORK

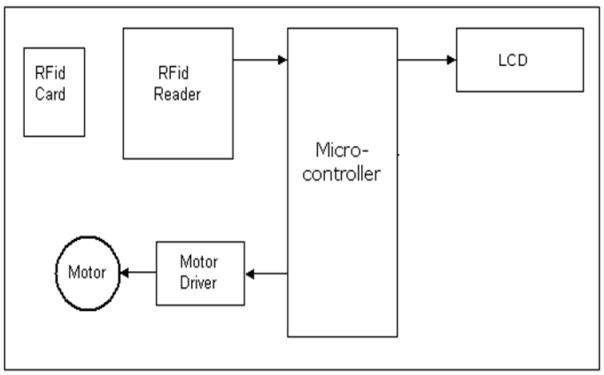

FIG shows the general block diagram of the proposed system.

The circuit shows that RFID [6] reader scan the RFID tag ID and the information is sent to the microcontroller. After the ID is read, Microcontroller checks whether the tag ID matches or not. If the ID is matched, LCD displays the string “ID is matched” on the LCD display and the motor movement indicates the opening and closing of doors. The motors are operated based on the H bridge circuit. They maintain a constant voltage across the circuit and prevent the circuit from damage. The clockwise rotation indicates

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the opening of the door whereas the anticlockwise rotation indicates the closing of door.

IV. SIMULATION CIRCUIT

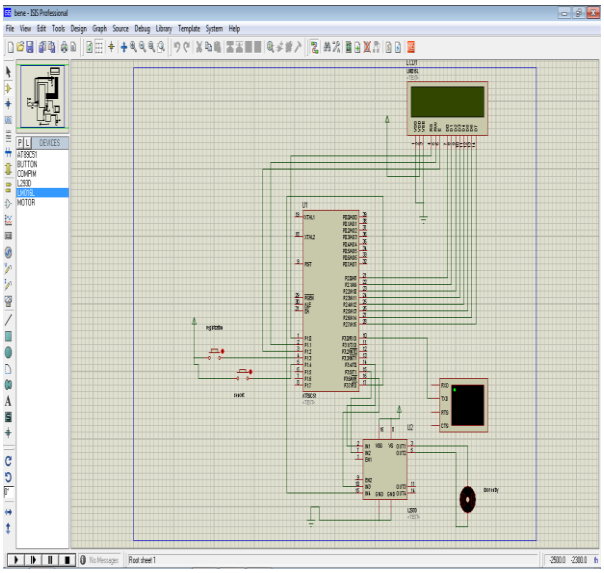


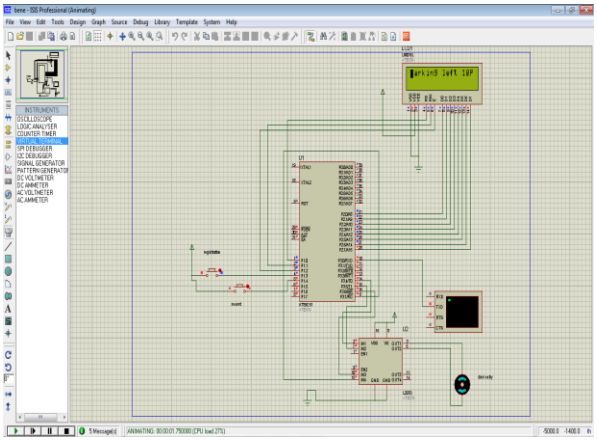
FIG shows the working of the proposed automatic car parking system simulated using Proteus software. When the hex file is loaded onto the AT89C51 microcontroller, the simulation begins. The display of the number of parking left appears. When the registration is clicked, the user is asked to register their ID and then the vacant space is filled by the car.

V. SIMULATION RESULTS

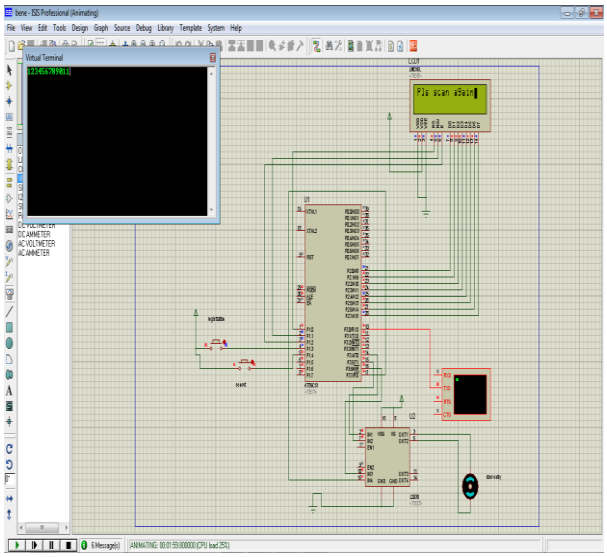
The simulation provides the output in the following order such as:

1. Display of the number of parking left
2. Registration of the RFID card
3. Creation of the user number in the Parking lot
4. Matching the ID card

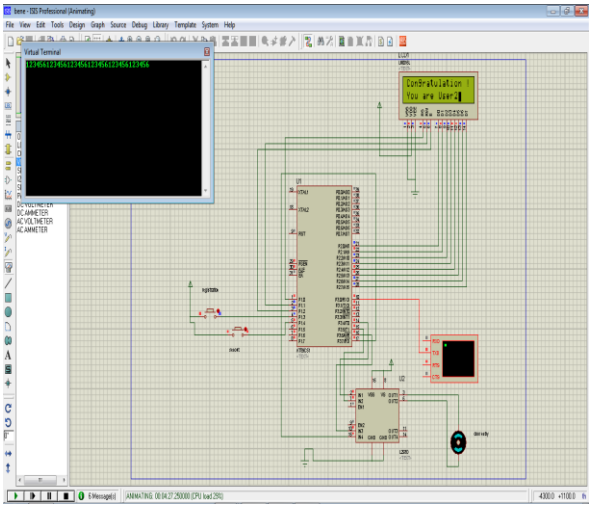
1. Display of the Number Of Parking Left



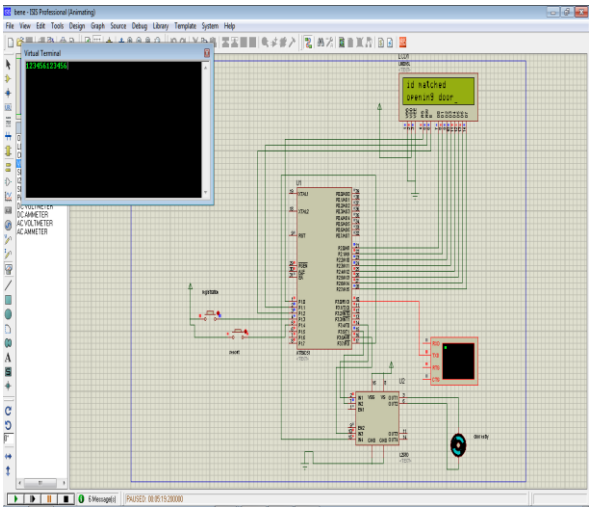
2. Registration of the Card



3. Creation of the user no



4. Matching the ID



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VI. DEMERITS OF OTHER PROPOSED SYSTEM

TITLE	AUTHORS	PUBLICATION	OBJECTIVE	LIMITATION
1.Automated car parking system commanded by android application[2]	D.J. Bonde, R. Shende, K. khaigwad, A. Kedari, A. Bhokre	IJCST VOL2, 2014	Car traces the path to the gate	Little human dependency
2.An approach to ioT based car parking and reservation using cloud [8]	V.Hans, P.S.Sethi , J. Kinra	IEEE 2015	Allots nearest parking slot	Minimum driving distance
3.Automatic car parking system[5]	M.S.R	IJCST 2015	Capture images of the slot	Image clarity is essential

VII. CONCLUSION

The project offers a new solution to the evolving technology such as: saving time and manual effort, problem of illegal parking, reduction of traffic jam and more safety parking high.

ADVANTAGES:
Users can have the clear idea of parking status at the entry point itself so that they can save their time and no need to wait for checking the parking lot.

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BIOGRAPHY

Bhenesha Shree received B.E degree in Electronics and communication Engineering from Alagappa Chettiar college of Engineering and Technology in 2015 and pursuing her M.E. in Embedded System since 2015, at Annamalai University Chidambaram-India.