

Smart Car Parking System

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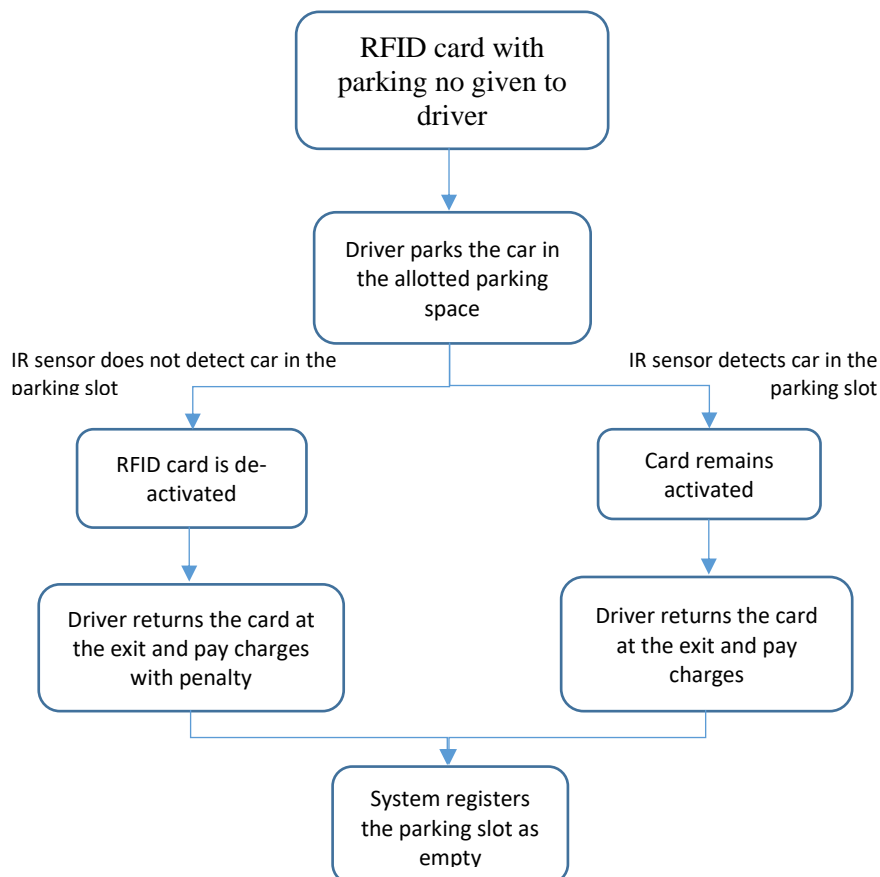
Abstract: People spend a lot of time, effort and energy in searching an empty parking space on a busy day in a mall or such other public places. The smart car parking system will help the drivers drive straight to the identified or allocated parking slot and thereby reducing a lot of unnecessary time and fuel in searching for an empty parking space.

Keywords: RFID Card, L.E.D, IR sensor, Arduino Nano

I. INTRODUCTION

Often when we go to malls or other shopping centres or such other public places in our cars, and we have trouble finding an empty parking slot for our cars. Sometimes we don't find a parking in the parking slot even after searching for a long time. This results in wastage of time and burning a lot of fuel. This situation can be resolved by implementing a proper parking system that relies on real time data using technology that reduces significant human efforts and possible errors. Thus, we have come up with an idea which will help reduce the wastage of time of the driver and also prevent the wastage of fuel and consequently, the pollution.

II. DETAIL EXPLANATION



This system requires two RFID readers (one near the parking lot and one at the exit) and an IR sensor below each parking slot. When a car enters the mall, the driver of the car will be given a RFID card with the designated car parking number. When the car reaches in the range of the RFID reader, L.E.D. above the allotted parking space turns on, indicating his allotted

parking space. Once he parks the car in the allotted parking space, the IR sensor linked to the allotted parking slot detects the car and turns the L.E.D. off.

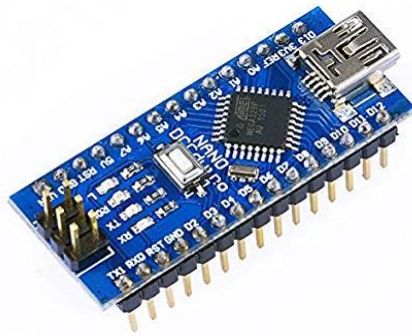
If the IR sensor of some other parking slot detects the car, it implies that the driver has parked his car incorrectly.

At the exit gate, the drivers are required to return the RFID card. Based on the time for which the car was parked in the parking slot, the driver will be required to pay the parking charges. If he had parked his car in a wrong parking slot, the RFID reader at the exit will alert the cashier about the wrong parking and the driver will be required to pay a fine for his incorrect parking.

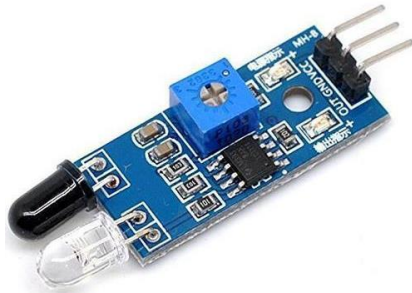
The driver is supposed to keep the card in his car while in the mall's parking lot.

Explanation of different parts:

Arduino Nano: Arduino Nano is a small board compatible with breadboards which is compatible with ATmega328. It has comparable usefulness to the Arduino Uno, however, when it comes to DIP module package, it works with a Mini-B USB link. This Arduino clone board is superbly compatible with Arduino IDE and cases.



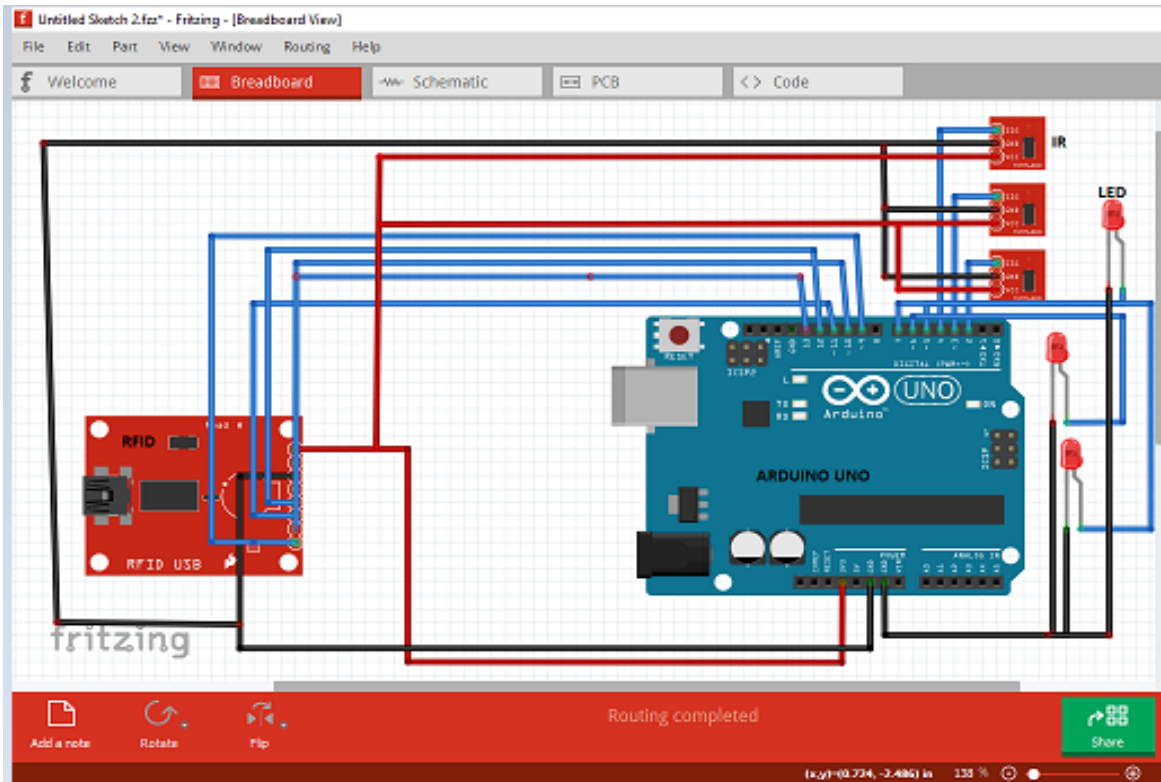
IR sensor: An IR sensor is an electronic device that emits in order to sense objects in the surroundings. An IR sensor detects the motion.



RFID: RFID is short for “radio-frequency identification” and it refers to a technology whereby digital data encoded in RFID tags or smart labels are captured by a reader via radio waves. RFID card has a copper wiring and a chip under the backside layer of the card. The chip is the heart of the RFID tag. The main function of the coil is to provide power to the chip as well as to work as an antenna to receive and transmit data.



Circuit Diagram



III. CONCLUSION

Since the drivers will be given RFID cards bearing the designated parking slot allotted to them, the drivers will go directly to their respective allotted parking slots, as compared to the current systems where the drivers have to roam around wasting a lot of time and fuel, and even then finding a parking space is not guaranteed. Where any driver parks the car at wrong parking slot, the error will be identified and the concerned driver will be penalised. This penalty will ensure that the drivers park their cars only in the designated parking slots. This system can be implemented in shopping malls, large commercial buildings and other public places.

IV. ACKNOWLEDGEMENTS

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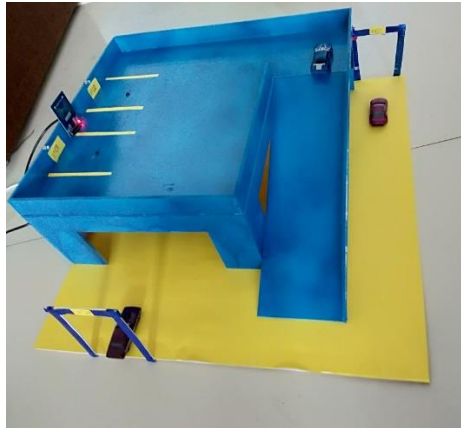
V. PROTOTYPE MODEL



A. FULL VIEW



B. SIDE VIEW



C. TOP VIEW

REFERENCES

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