Smart Home and Car Parking System using Ni Lab View

K. Krishna Prabhu, K. Poojitha, N. BalaTeja

Abstract: This paper proposes the concept of home automation and car parking in NILABVIEW. Smart home is a house that uses information technology to monitor the environment, control the electric appliances and communicates with the outer world. We use Ni Lab view software for smart home design with the facilities of internal lightening system, external lightening system, temperature, burglar alarm, water sprinkler, water level representation in water tank . After this it will be implemented in hardware to calculate the total energy. This will give the better analysis of the smart home system for usage and control. This paper also proposes a smart parking system to solve the problem of unnecessary time consumption in finding parking spot in commercial car park areas. The proposed car parking system takes the help of IR sensors to find the car at the entrance and at the exit area and thus allocates and de-allocates the available parking slots to the vehicles. This system clearly displays the total parking slots available and indicates the occupied slots and unoccupied slots in display board so that user can check the slots before entering the parking area and can park his car in that slot with in no time.

Keywords: Lab View, Infrared sensor, Automation, Sun Lightening, Alarm.

I. INTRODUCTION

The process of controlling or operating various equipment, machinery, industrial processes, and other applications using various control systems and also with less or no human intervention is termed as automation. There are various types of automation based on the application they can be categorized as home automation, industrial automation, autonomous automation, building automation, etc. In this paper, we discuss about wireless home automation using IOT .Home automation is the process of controlling home appliances automatically using various control system techniques. The electrical and electronic appliances in the home such as fan, lights, outdoor lights, fire alarm, car parking etc., can be controlled using various control techniques[1]. In order to reduce the damage caused by illegal parking and parking space shortage problems, we try to develop a smart parking system that manages the conditions[2] . Various systems have been done to ensure smoothness of traffic in car park areas.

K. Krishna Prabhu , Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur district, India,
K. Poojitha, Electronics and Communication Engineering Koneru Lakshmaiah Education Foundation, Guntur district, India,
N.BalaTeja, Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur district, India,.

From manual implementations used in the old systems, they have evolved into fully automated, computerized systems[3][4]. There are various techniques to control home appliances such as IOT based home automation over the cloud, home automation under Wi-Fi through android apps from any smartphone, Arduino based home automation, home automation by android application based remote control, home automation using digital control, RF based home automation system and touch screen based home automation. Wireless home automation using NI LabVIEW is developed to control home appliances remotely over the cloud[5].

II. RELATED WORK

The work mainly focuses on the improving the smart home automation system has been developed to automatically achieve some activities performed frequently in daily life to obtain more comfortable and easier life environment conditions. A sample house environment monitor and control system that is one branch of the Smart home is addressed in this paper. The system is based on the LabVIEW software and can act as a security guard of the home. The system can monitor the temperature, humidity, lighting, fire & burglar alarm, gas density of the house and have infrared sensor to guarantees the family security.

With technological advances, the control in a smart house frameworks advance and incorporate new and refined techniques dependent on various control projects and frameworks.

2.1 NI LABVIEW

LabVIEW is an advancement domain for making graphical projects called virtual instruments (VI), that simulate real research facility instruments. A VI comprises of two sections: a front board and a back board. The front board enables the client to associate with the VI by showing yield and enabling the client to supply the program with information. The back board comprises of the code utilized by the VI to get contribution from the front board, work on the information, and show the outcomes.

The front board is fabricated utilizing controls and markers. Controls are inputs that enable a client to supply data to the VI. Markers are yields that show the outcomes dependent on the information sources given to the VI. Controls can be switches, handles, dials, and catches. Pointers can be meters, measures, LEDs, and showcases. These are situated on the controls palette and can be set on the front board.

The back board, which is a square chart, contains the graphical source code. The majority of the items set on

the front board will show up on the back board as terminals. The back board likewise contains structures and capacities that perform tasks on controls and supply information to pointers. Structures and capacities are found on the capacities palette and can be put on the back board. On the whole, controls, markers, structures, and capacities are alluded to as hubs. Hubs are associated with each other utilizing wires National Instruments' Educational Laboratory Virtual Instrumentation Suite (NI-ELVIS) board is one arrangement LabVIEW can use to physically interface with the outside world. Remember that National Instruments offers diverse equipment answers for meet customers' individual needs.

III.PROPOSED SOLUTION

A smart home is equipped with technologies that make our lives more convenient and energy efficient. Today, the growing range of technologies encompasses smart home appliances, mobile devices and home automation systems, many of which are interconnected. But being 'smart' in this sense requires appliances and systems fitted with the right semiconductor solutions. They empower smart appliances, devices and systems to make sense of their environment and current situation. In this undertaking utilize the LabVIEW program, and remote control to control the flag and send it to LabVIEW to experts it. The LabVIEW programming system can choose the season of morning also, evening time to control the status of outer light lights. The LabVIEW programming system will peruse and process the sun cell esteem and show to the status of day morning or night in LabVIEW front board screen.

3.1 Internal lightening System
The inside lighting framework comprises of a PIR movement sensor, dimmer and lights which there are in contact with LabVIEW programming program[Fig1]. This framework will make a naturally lighting in the house at the point when there is any development inside it. Dimmer can use to make a little light lighting rate, and LabVIEW will make 100% lighting for the light when it gets a development motion from PIR movement sensor and the client can scheduler the season of running the framework. At the point when the PIR movement sensor identifies a moving item, it will send a flag be that as it may, it will be for a particular brief period. Therefore, 555 clock circuit is utilized to create precise time defers that will be more reasonable for light lighting inside the house. The LabVIEW programming program client can screen the framework by the LabVIEW front monitor screen.
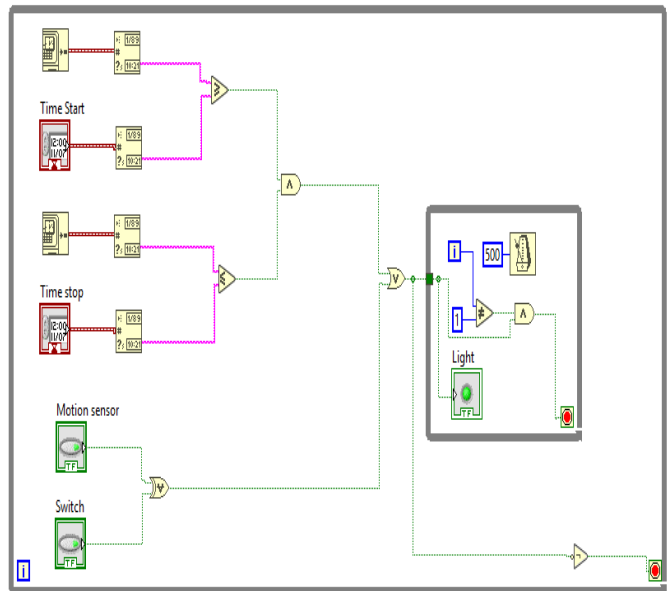

Fig 1: Internal Lightening system Block diagram

3.2 External lightening System
Outer lighting framework comprises of sun cell, dimmers and lights which are in contact with lab VIEW programming program. Outer lighting framework relies upon the perusing of sun cell. The yield of the sensor will be in simple shape[Fig 2]. Contingent upon the time of morning and evening time the Lab VIEW programming program control the status of outer light lights which is as appeared in outline. Dimmer can use to make a little light lighting rate. In early morning what's more, in night, the dimmers will be on. Due to natural changes, contingent upon the sun cell esteem light may even sparkle in noon.
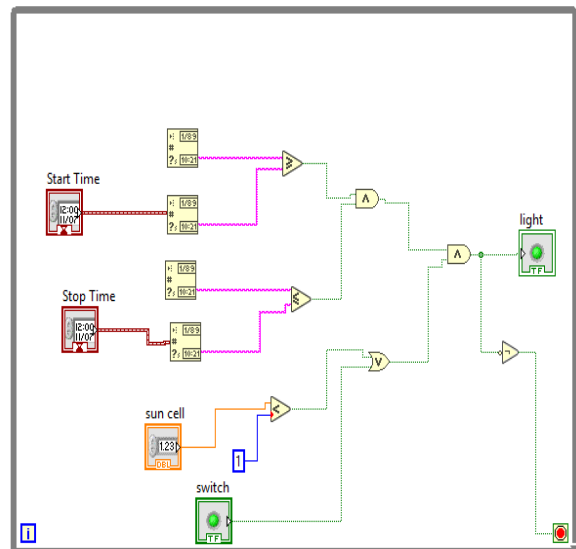

Fig 2: External Lightening system Block diagram

3.3 Temperature system:

At the point when movement sensor recognizes the human nearness in the building both interior lighting and cooling frameworks are enacted. The principle protest room temperature sensor and basic estimation of temperature that required[Fig 3]. At the point when the room temperature detected esteem is more noteworthy than or not exactly the basic temperature, at that point in temperature framework is the perusing of temperature esteem from temperature sensor. In the wake of handling the structure in the program, lab VIEW sends a warming or cooling sign to the framework, contingent upon the lab VIEW sends the flag to the gadget to cool or hot it up to the basic temperature and after that keep up steady basic temperature.
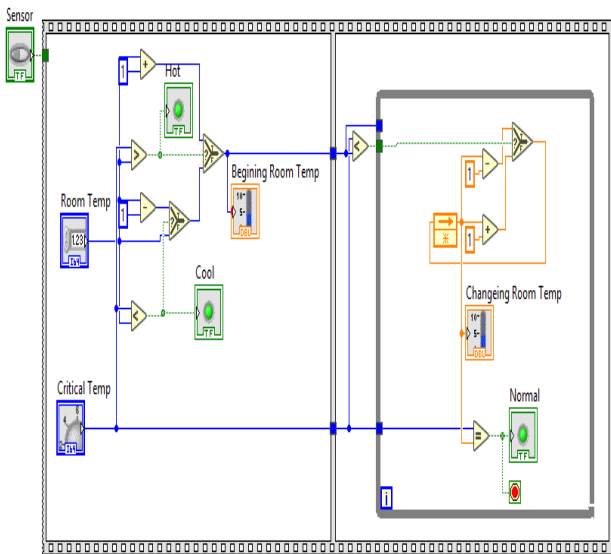

Fig 3: Temperature system Block diagram

3.4 Water sprinkler:

In garden irrigation, the moisture of the soil is measured using soil humidity sensor and compares it with the threshold value, if moisture exceeds the limit it automatically sprinkles water as it is connected with the plumbing system. In case of enough humidity, sprinkler remains in OFF position[Fig 4]. This is one of the method used in irrigation by the farmers for watering the plants in a regular intervals of time both in dawn and dusk .This method is used In the home gardening .Here in this home gardening also by using the Ni Lab view tool we design the algorithm and block diagram here we use the timer and we set the preferred time for the sprinkling in both times like dawn and dusk.
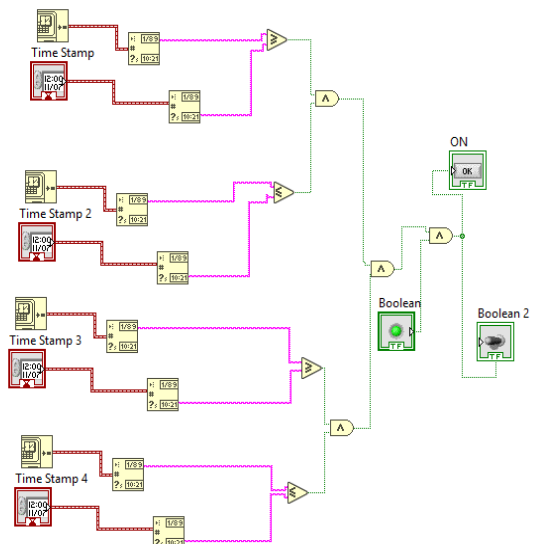

Fig 4: Water Sprinkler Block diagram

3.5 Burglar Alarm Systems:

The plan of Burglar alert framework utilized in brilliant house system is like the plan of flame alert framework. It is separated into three sections; the initial segment is the flag that ranges from criminal alert sensors when its trigger edge has been come to in the wake of recognizing a particular risk in the house. The second part is the yield flag that transmits the preparing of information flag and last part is the controlling framework and information handling by Lab VIEW[Fig 5]. Here we take a potentiometer for distinguishing change in obstruction, assume cheat open the entryway, at that point some contact between his foot and floor that makes some opposition. So we assume optimal esteem 2, slight change in this esteem alert or lead is ON.
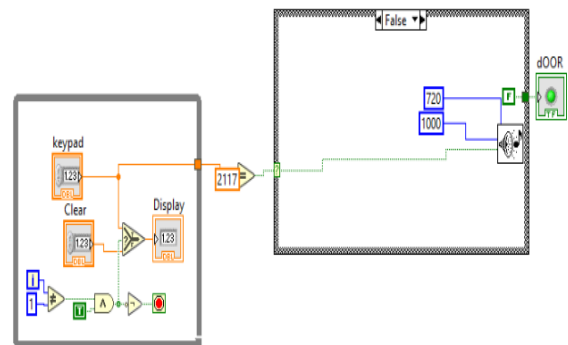

Fig 5: Burglar Alarm System Block diagram

3.6 SMART CAR PARKING SYSTEM

It takes the help of IR sensors[Fig 6] to find the car at the entrance and at the exit area and thus allocates and de-allocates the available parking slots to the vehicles. This system clearly displays the total parking slots available and indicates the occupied slots and unoccupied slots in display board so that user can check the slots before entering the parking area and can park his car in that slot with in no time[Fig 7]. The parking slots are continuously monitored and the data is continuously updated in the display board.
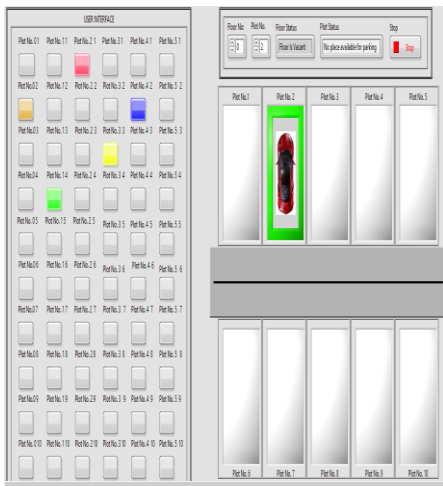

Fig 6: Car parking System

Fig 7: Car parking in floor type

IV. RESULTS AND DISCUCCIONS

Internal Lightening

Fig 8: Internal Lightening system Front Panel

In internal lightening system we designed on two systems combine PIR sensor time scheduler[fig 8]. By this PIR motion sensor it can detect if any sense in room it switch on the lights and scheduler keeps time so by this lights will on automatically.
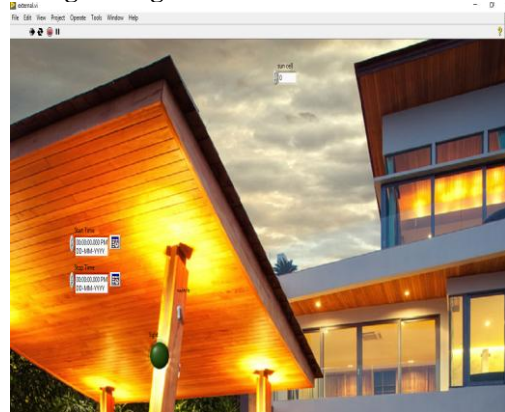
External Lightening:

Fig9: External Lightening system Front Panel

By this External lightening system were outside can detect by LDR sensor so that when sun light is low it automatically switch on the light and when sun light is high it will off the light[fig 9].
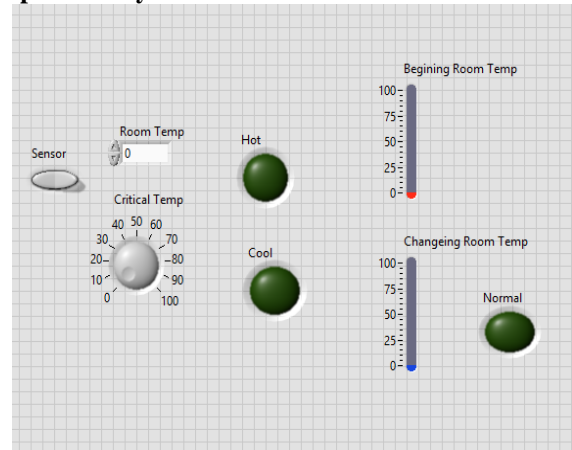
Temperature system

Fig 10: Temperature system Front Panel

By this temperature system at first the critical temperature is set when it crosses that is hot inside it should cool the room and also it is hot it will display red light and when it is cool it will display cool light.[fig 10].

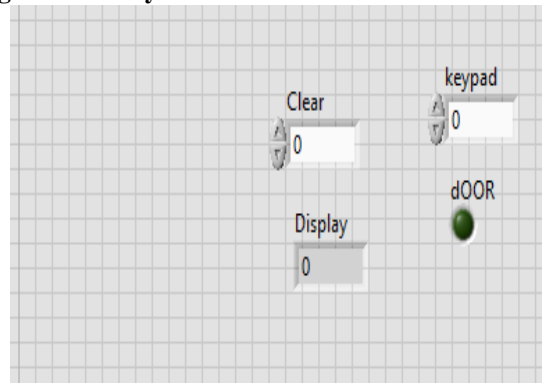**Burglar Alarm Systems:**

Fig 11: Burglar Alarm Front Panel

By this Burglar alarm system we can know who are coming whether the person belongs to that house or not. At first he should enter the key after it will authenticate if key is correct it will open the paper and when key is wrong it ring alarm.

Water sprinkler

For Sprinkling of water any time we will keep scheduler. By this we can set the time so that it will sprinkle the water without human presence.
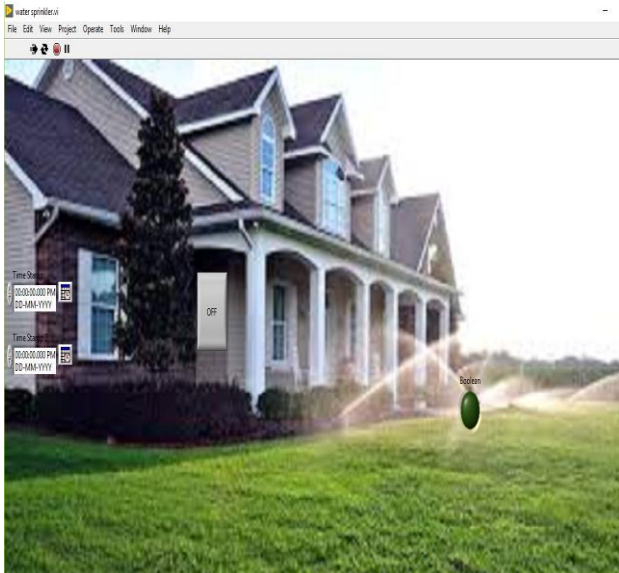

Fig 12: Water Sprinkler Front Panel

Smart Car parking system

Fig 13: Smart carking Front Panel

By this we can get the exact location of were the car parked and we can know on which floor it is parked and how are still vacant all these will display on the screen. For suppose when car came for parking it should know that were has to park so for that we designed a parking system like it will assign particular slot to park the car and after parking it will display particular slot is filled.
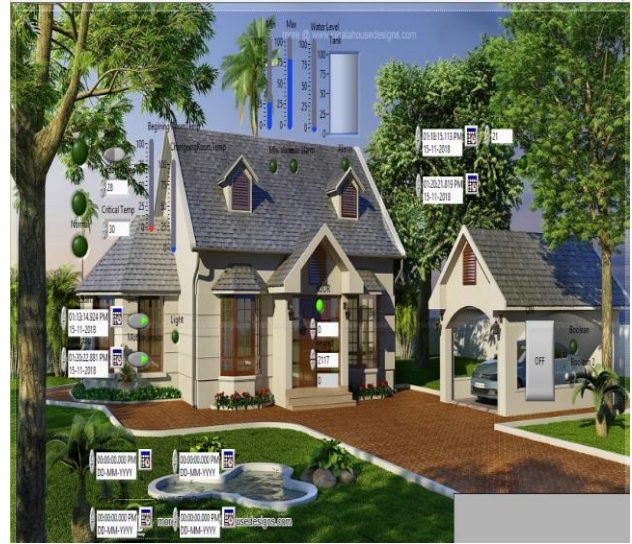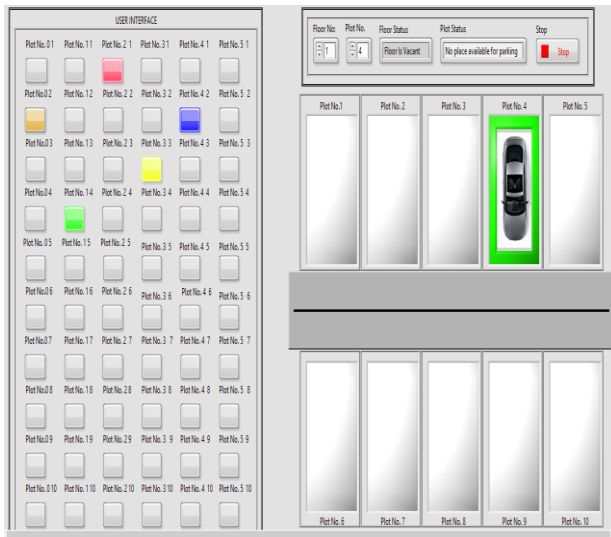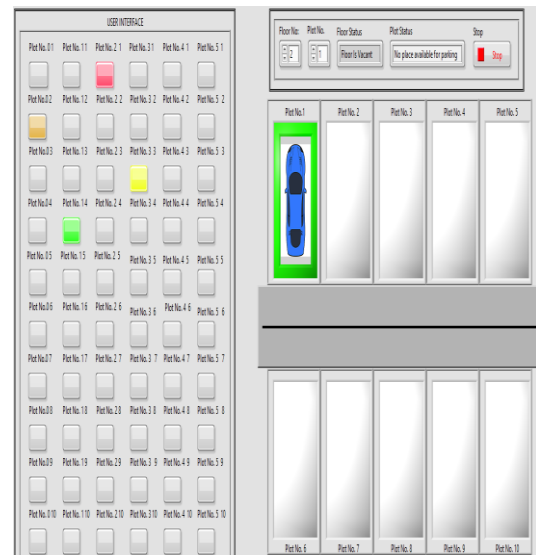
Combined Output:

Fig 14: Combine output Front Panel

It is the final design of our project were all the modules are connected and observe the smart home automation techniques and get the results in the presence of sunlight and timing conditions.

Fig 15: Car parking output Front Panel

In this we are seeing when the car is 2nd floor 1st position is parked so that it is displaying car is parked and no space for parking. By this if any one has to park the car on 2nd floor at first it will display that 2nd floor 1st slot is parked and remaining slots are vacant it will display on the screen like this remaining floors position also displayed in screen.

V. CONCLUSIONS

Smart home automation is therefore displayed and simulated utilizing LabVIEW. We have built up an adaptable particular keen home application utilizing the visual programming worldview and the LabVIEW condition, which meets effectively the underlying client prerequisites for a totally utilitarian system. LabVIEW is perfect for any estimation or control system, incorporating graphical devices that encourage the working of an extensive

variety of utilizations in drastically less time than utilizing different practices. Obviously, the displayed system displaying and execution worldview can be effectively relocated to an expansive scope of computerization applications. By the smart car parking we can reduce the time consuming and can easily get the car outside without any disturbance.

VI. FUTURE SCOPE

The future scope focuses on implementing the smart home and smart car parking system using IOT. IoT allows you to automate and control the tasks that are done on a daily basis, avoiding human intervention. Machine-to-machine communication helps to maintain transparency in the processes. It also leads to uniformity in the tasks. It can also maintain the quality of service

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AUTHORS PROFILE

K.Krishna Prabhu studying B.Tech in Electronics and Communication Engineering stream from KLU.

K. Poojitha studying B. Tech in Electronics and Communication Engineering stream from KLU.

N. BalaTeja studying B. Tech in Electronics and Communication Engineering stream from Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur, AP, India.