Automated Street light and Traffic Signal Controller

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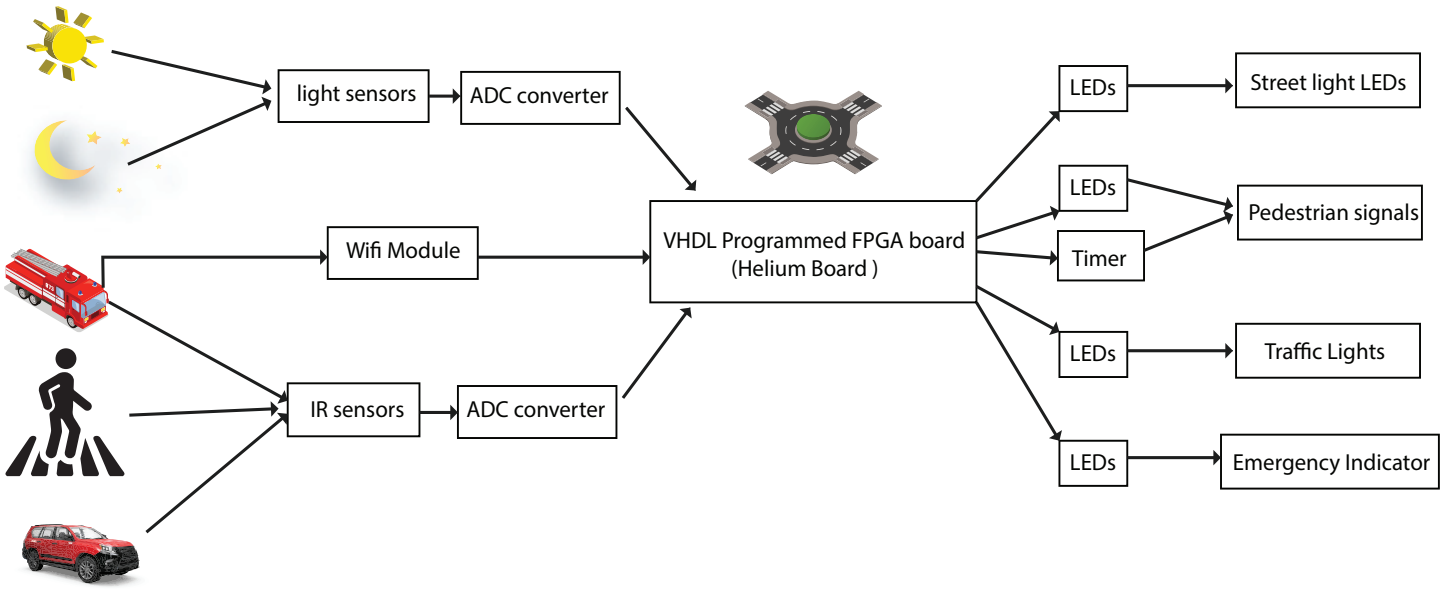
Abstract:

The street lightning consume huge amount of electric power and the cost per unit is expensive also we have limited resources for power generation so it is always better to depend on renewable sources. The traffic control system is one of the major issue in the current world where mishappenings occur despite maintained human control . Hence automating this system will reduce the human intervention and improves the control system .For the street light controlling part we are using sensors to detect the presence of traffic and check whether it is day time or night time and the process the outputs of these to get the desired implementation . For the traffic controller,we implement a fully functional traffic signal controller for a four-way intersection. Intersection is complete with sensors to detect the presence of vehicles waiting at or approaching the intersection.These include VHDL for modeling and finite state machines, serial communication and uploading the VHDL design code on ALTERA kit for verification of design

System Overview



In this model, normal vehicles, emergency vehicles and pedestrians are considered.The presence of the sunlight is taken into account to check whether it is day time or night time.The presence of the sunlight is detected by the light sensors and the corresponding output of the sensors is passed on to the programmed helium board.The corresponding output of the helium board goes to the street lights. The presence of the normal vehicles and the pedestrians is detected by the IR sensors and the corresponding output is passed on to the VHDL programmed board and the corresponding output is sent to the traffic signal LEDs and the counters arranged.The presence of the emergency vehicles is detected by the signals received by the board from the emergency vehicle and the corresponding output of the board goes to the traffic lights and emergency indicator

Implementation details

Software implementation details :

- First there is a RESET State in which traffic is open one by one for each road for a pre decided time .
- After this , All the padestrians will have some time(pre decided) to cross the roads.

- In Addition to this if on any road if there is an emergency vehicle(say road 2) then we will terminate green signal of current road after a very few seconds and open the traffic for road 2.

Hardware implementation details :

- **COMPONENTS :**

1. Light sensors : LDR
2. Vehicle sensors : IR sensor
3. Emergency sensor : Wifi module
4. Vehicles : toys of vehicles
5. Pedestrians : toys of people
6. Street lights : LEDs
7. Traffic lights : LEDs
8. Emergency indicators : LEDs
9. Waiting time Display : seven segment displays
10. Others : A/D converters , helium board

- A model of the four way junction is made. Each way is controlled using a traffic light system .
- A traffic light system includes the traffic signal controller ,which is implemented using the LEDs and timers and street lights.
- The LEDs , sensors and boards are fixed in appropriate places using the adhesives and soldering etc .Thus the complete model is bulit.