



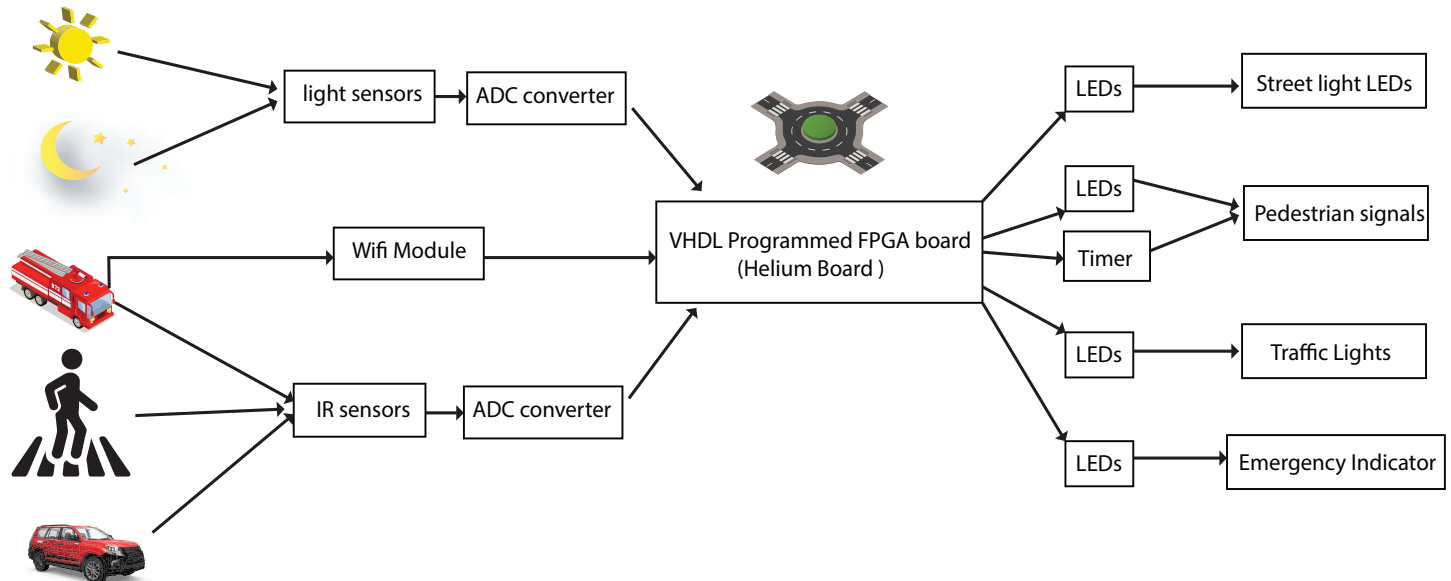
# Automated Street light and Traffic Signal Controller

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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

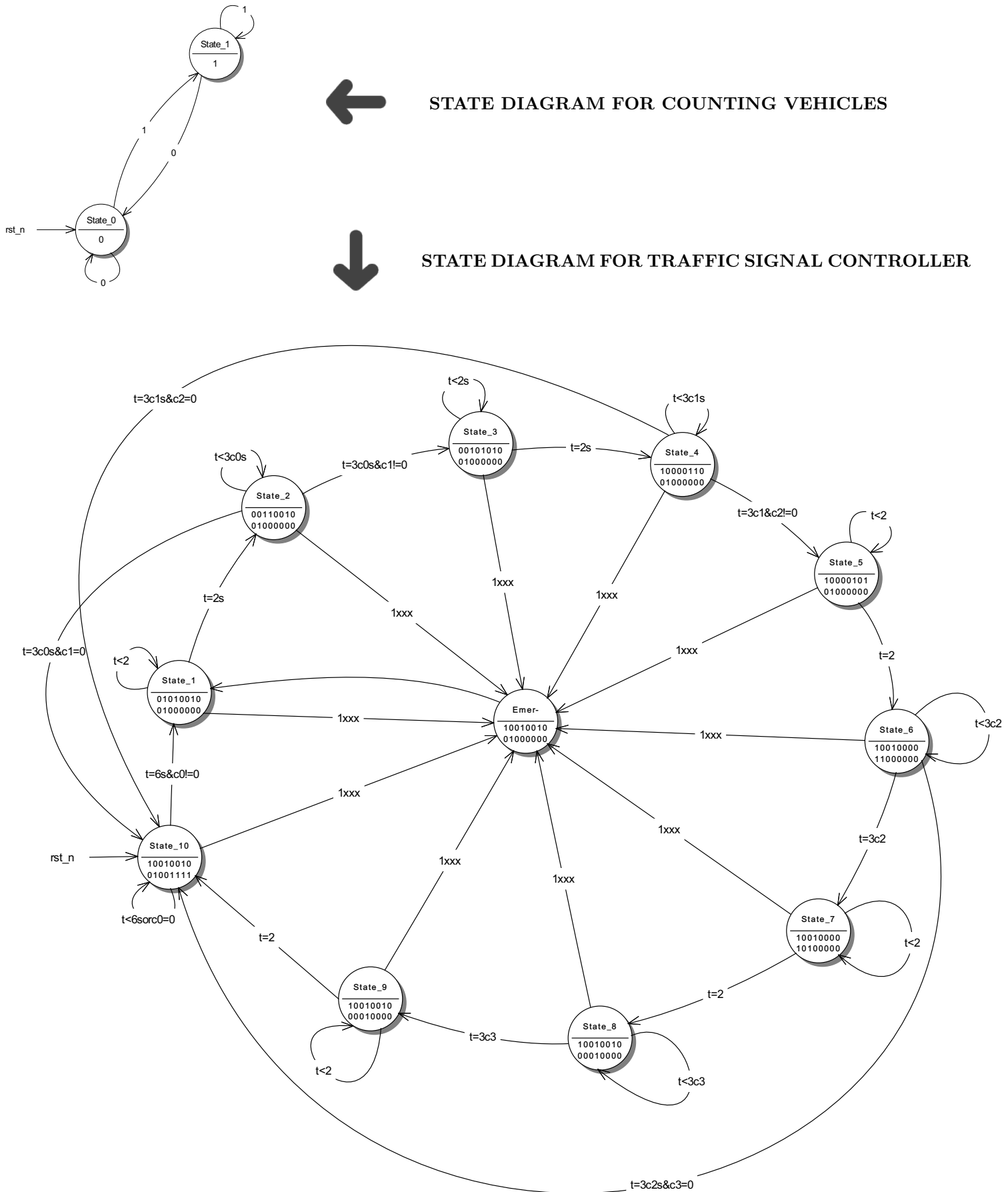


**BLOCK DIAGRAM FOR THE TRAFFIC SIGNAL CONTROLLER**

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 :



- The vehicle counter is made such that the output becomes high when there is a vehicle and a variable is incremented every time the output becomes high.
- Thus the vehicles are counted .
- At the reset state the pedestrians are allowed to pass and all the roads are given the red signal for 10sec
- It is this time the vehicles are counted and the count is stored in descending order in some variable .
- After this the green signal is given to the road with highest count and the time of allowance will depend on the number of the vehicles .
- After this the road the having the second highest count is allowed .
- Thus the signals are given in case of the normal vehicles .But , in case of an emergency the this system is stopped and the road with an emergency is given green signal .
- The emergency vehicle counter will also be there to count the number of emergency vehicles at each side to give the priority to the road with maximum count of the emergency vehicles .
- So the loop runs similar to the loop for normal vehicles.
- After all the emergency vehicles are passed , the vehicles are counted again in all directions and then the signals for the normal vehicles are given .

## Hardware implementation details :

### • COMPONENTS :

- |                     |                    |                         |                                 |
|---------------------|--------------------|-------------------------|---------------------------------|
| 1. Light sensors    | : LDR              | 6. Street lights        | : LEDs                          |
| 2. Vehicle sensors  | : IR sensor        | 7. Traffic lights       | : LEDs                          |
| 3. Emergency sensor | : Wifi module      | 8. Emergency indicators | : LEDs                          |
| 4. Vehicles         | : toys of vehicles | 9. Waiting time Display | : seven segment displays        |
| 5. Pedestrians      | : toys of people   | 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 built.

## Conclusion

- Using this simple model , we can think of better way of controlling the traffic today instead of using simply some timers for the traffic signal controllers
- This project presents some ideas on the traffic signalling for saving the time for the people and emergency vehicles .
- Let us develop more ideas using this project for better safety , efficiency .

