



Density Based Traffic Light System

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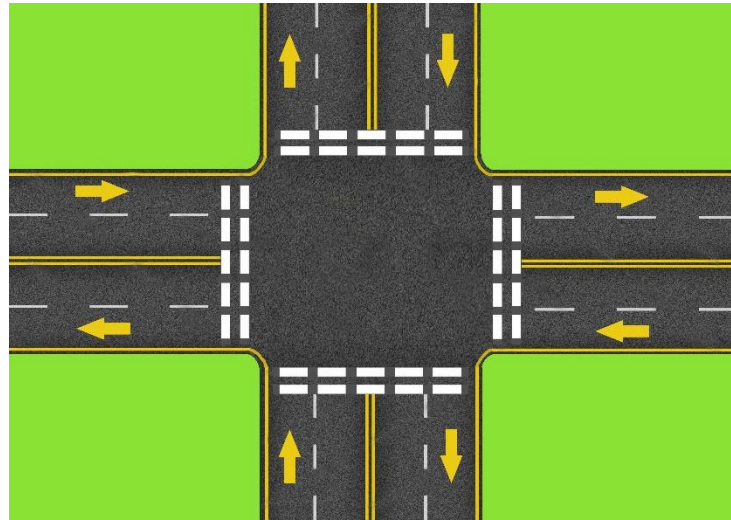
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DENSITY BASED TRAFFIC LIGHTING SYSTEM

ABSTRACT

- Arduino is an open-source computer hardware and software company, project and user community that designs and manufactures microcontroller-based kits for building digital devices and interactive objects that can sense and control the physical world.
- The project is designed to develop a density based dynamic traffic signal system. The signal timing changes automatically on sensing the traffic density at the junction. Traffic congestion is a severe problem in many major cities across the world and it has become a nightmare for the commuters in these cities.
- Conventional traffic light system is based on fixed time concept allotted to each side of the junction which cannot be varied as per varying traffic density. Junction timings allotted are fixed. Sometimes higher traffic density at one side of the junction demands longer green time as compared to standard allotted time.
- The proposed project using an Arduino Uno interfaced with sensors, changes the junction timing automatically to accommodate movement of vehicles smoothly avoiding unnecessary waiting time at the junction.
- The sensors used in this project are Infrared Proximity sensors in line of sight configuration across the loads to detect the density at the traffic signal. The density of the vehicles is measured in a number of zones based on which

timings are allotted accordingly. Each zone will have 2 infrared sensors and based on the information from various IR sensors the intensity of the traffic is found and categorised into low, medium and high based on which signal timings are increased or decreased in the respective junction.



4 Way Junction

- Further the project can be enhanced by synchronizing all the traffic junctions in the city by establishing a mesh network among them. The network can be wired or wireless. This synchronization will greatly help in reducing traffic congestion. This kind of mesh network can be easily implemented in the existing traffic light system using wired mode of communication.
- The position of the infrared sensors have to be changed based on the region of implementation of this system, for developed countries where pedestrian crossing systems are implemented & utilised properly the infrared sensors can be placed on street light poles on the road sides whereas for developing countries sealed units containing these IR sensors can be placed underneath the roads so that pedestrian or any other object movement is not misunderstood as traffic or vehicle, these sensors have to be placed in the centre of each lane underneath the road so that vehicle's presence is accurately detected and distinguished from animals or pedestrian crossing.



Conventional Traffic Light system