**Abstract**

**Smart City and Data Visualization**

Urban performance currently depends not only on the city’s endowment of hard infrastructure, but also on how intelligently and efficiently city’s overall management is carried out. It will help to improve superiority of life and increase involvement of citizens in the governance of cities.

Even developed cities are facing many problems like poor management of street lights, drainage, fire safety, traffic management, etc. Authorities often take measures to prevent against all these problems but they are not able to overcome all of them completely. So to get rid of all these problems, we come up with a concept of Smart City which can offer possible solutions to the above mentioned problems.

Smart City refers to the city automated in various aspects. These aspects could be traffic analysis, street light control, fire detection, drainage-overflow detection, gas-leakage detection, temperature measurement etc.

Data Visualization involves the creation and study of visual representation of data. Its main goal is, to communicate information clearly and effectively through graphical means. We will develop the system as a platform to connect key services like traffic analysis, street light control, fire detection, drainage-overflow detection, gas-leakage detection, temperature measurement, etc. to give the graphical view of city for all these aspects to authorities.

**Project Description:**

We will formulate model of a miniature of city. The model will be incorporated with different types of sensors like light detectors, fire detectors, drainage-overflow detectors, gas-leakage detectors, temperature detectors, etc. The software will encompass an API of map implemented and will demonstrate the visual representation of the data received on the equivalent map of the city.

**Functionality:**

1. Controllable

* Street lights
  + Light detectors will be used to ensure the intensity of light of the surroundings and will be used to control the street lights.
  + Street lights can be controlled on the basis of time i.e. daytime or nighttime.

1. Visualization

* Live Visualization
  + **Traffic Analysis:** Traffic will be analyzed by processing the captured video of the road and the visual representation of it will be shown on the map publicized in the software.
  + **Fire Detection:** Fire sensor will sense the fire and if detected, then it will symbolize the area where it is detected.
  + **Drainage-overflow Detection:** The electrolysis-based drainage sensor will sense the gutter overflow and if detected, then it will symbolize the area where it is detected.
  + **Gas-leakage Detection:** The gas-leakage sensor will sense the leakage of gas and if detected, then it will symbolize the area where it is detected.
  + **Temperature Measurement:** The temperature sensor will sense the temperature and if detected, then it will symbolize the area where it is detected.
* Data Visualization
  + **Traffic Density:** The data recorded from the above functionality of traffic analysis will be used to visualize the traffic density of different routes.
  + **Population Density:** The data about population in different areas will be entered and will be used to visualize the area-wise population.
  + **Crime Rate:** The data about crime-rate in different areas will be entered and will be used to visualize the area-wise crime-rate.