

Smart Traffic Lights

The problem

Traffic lights' timings and intervals are fixed.

This leads to:

- 1) Traffic Jams and Congestion
- 2) Increased Travel Time
- 3) High air and noise pollution



A close-up photograph of a person's hand, wearing a dark sleeve, pointing with their index finger at a document or map. The background is blurred, showing some bokeh light effects. The text 'The solution' is overlaid in white on the left side of the image.

The solution

Dynamic timings of red traffic light based on the number of vehicles on each road of the square.

How it works

Camera Input

Input is taken from a rotating camera or 4 stationary cameras at centre of the square.

It is then sent to the nearby Computer through **WiFi** of Raspberry Pi or uploaded to the server through the same Pi.

Processing

Processing is done to get the number of vehicles from the input.

Faster R-CNN implemented in tensorflow is used along with Computer Vision.

Algorithm

An algorithm decides which of the three lights- Red, Yellow, Green should glow.

It depends on the number of incoming vehicles from each of the four roads.

Sending Output

The Output of the algorithm is send back to the same Raspberry Pi.

This is done either using the same **WiFi** connection or sending the signal through the internet from the same server.

Dynamic Lights

Traffic Lights glow automatically based on the number of vehicles.

Hardware circuit is implemented on the same Raspberry Pi and output is given to the connected traffic lights.

Implementation Challenges

- Designing the algorithm that works for all the cases.
- Real time accurate processing of the trained model.
- Speed of sending and receiving the camera fed from and to the controller.