Raspberry Pi Controlled Traffic Density Monitoring System

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Abstract—**This paper explains a Raspberry Pi controlled Traffic Density monitoring system. Raspberry Pi is a single board computer which can be effectively used for multi-functionalities. Here is the one of the ways of using this for multiple purposes. It is used for traffic surveillance purpose where the traffic is continuously monitored and recorded. In addition to this, it is used for detecting the traffic density and gives the traffic report to the travelers. This traffic report is updated periodically and displayed on the screens installed at the public places. These screens can also be used for advertising purposes which is an additional advantage. Using Raspberry Pi one can manage the preference of advertising and displaying traffic report. This installation supports Government by making things digitalized. This also helps in avoiding usage of papers and plastic for advertising. It results in saving environment by reducing plastic usage and also by reducing the deforestation. This method is very cost effective.**

Index Terms— **Raspberry Pi; Traffic Density; Live Streaming; Advertisements; Traffic Surveillance.**

I. INTRODUCTION

At present the number of vehicles is increasing day-by-day increasing the traffic congestion on the roads which leads to accidents, jumping off the traffic signal. It needs to be reduced as per the vehicles which are available on road lanes.

The traffic surveillance process plays a very crucial role in finding the victim who caused thetraffic obstruction leading a way to development of traffic surveillance which is done using Raspberry Pi rather than using conventional methods. The installed Raspberry Pi system gives live streaming of the monitored traffic in a particular area. This method is adapted by considering the other advantages that comes along using Raspberry Pi. Along with live streaming, this system allows the camera to detect the traffic density in the surrounding places. This adds an additional advantage to our system by simultaneously doing another task without interrupting the main task.

It gathers the information about statistical distributionof traffic over the geographical area which is under surveillance and stores it in a database. To let the users (traveler's) know the information about traffic density, display screens placed will be those public places and there will be a website which is specially designed to show the traffic compactness in a particular place. Thus people will be aware of the traffic in advance and change their path to reach their destination in time.

A. Raspberry Pi

Raspberry Pi [1] (shown in Fig. 1) is a credit card sized single board computer. This board is cost effective when compared to an actual computer, uses power rating of 5V, 700mA and it weighs not more than 50g. It comes in 3 variants of Model 1 A+, Model 1 B+ and Model 2 B. It is also available as Compute Module Development Kit, which is handy device for industrial applications and has more flexibility.
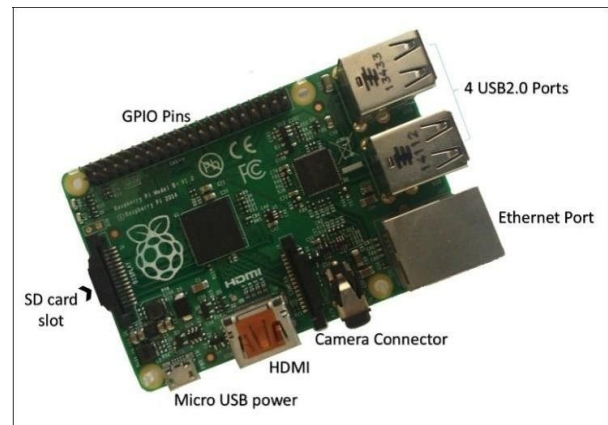

Fig. 1. Raspberry Pi 1 B+ Board

It typically operates on ARM11 processor at 700MHz frequency with 512MB RAM. It runs the operating systems like Noobs, Rapsbain etc. which is installed on the SD card. It has 1 Camera connector to interface with the camera module.Accessories like Keyboard, Mouse and USB Wi-Fi dongle can be connected through 4 USB 2.0 ports. Ethernet connectivity through RJ45 port, 3.5mm Audio Port with low noise power supply can be linked up. It can be connected to LCD/LED monitor, Televisions and projectors to display the information through HDMI port. The sensors, switches and control of LED's are done by 40 GPIO pins. By all these embedded on a single board, Raspberry Pi is not just limited to single use, it can be of wide use according to theapplication.