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Evolving Machine Intelligence toward tomorrow's Intelligent Network Traffic Control Systems

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Abstract: **- An effective traffic signal management project that allows for managing 4 way traffic signal management system. The system consists of 4 signals corresponding to each road. We here propose a density based traffic signal scheduling algorithm. The system is designed to manage traffic signal timings based on the density of traffic on its corresponding road. The system represents the traffic strength of a road graphically using traffic judgments. By measuring the traffic lined up on a particular road the signal timings are adjusted to let that particular way clear out and then the next populated one. The entire system works according to an algorithm that allows for smooth and efficient traffic flow across all four ways. It also consists of an emergency override that allows traffic authorities to remotely let go a particular signal in case an ambulance or important vehicle arrives on that way.**

I. INTRODUCTION

Recently, the rapid development of the current Internet and mobile communications industry has contributed to in- creasingly large-scale, heterogeneous, dynamic, and system- atically complex networks. The core networks have grown substantially larger as greater switching capacities are introduced in the Internet core and more, bigger routers with more/faster radio links are deployed in the wireless enterprise backbone networks. Such complex network systems confront a myriad of challenges including management, maintenance, and network traffic optimization. Furthermore, most of these packet-switched networks are experiencing a sharp growth in data traffic owing to the rapid development of mobile user equipment, social networking applications and services, and so forth.

The existing network policies are not adequate to adapt to the continually changing network conditions arising from the explosive traffic growth. In these years of tremendous growth in the network traffic, while the network operators frequently expressed concern regarding declining profits, it is almost the perfect time to rethink how the network traffic control can be improved. Therefore, incorporating intelligence into network traffic control systems can play a significant role in guaranteeing Quality of Service (QoS) in Internet Protocol (IP)-based networks. Over the past few decades, machine learning (ML) has been exploited to intelligently dictate traffic control in wired/wireless networks.

Application of Intelligent network traffic control system can be seen as new paradigm shown in Fig. 1

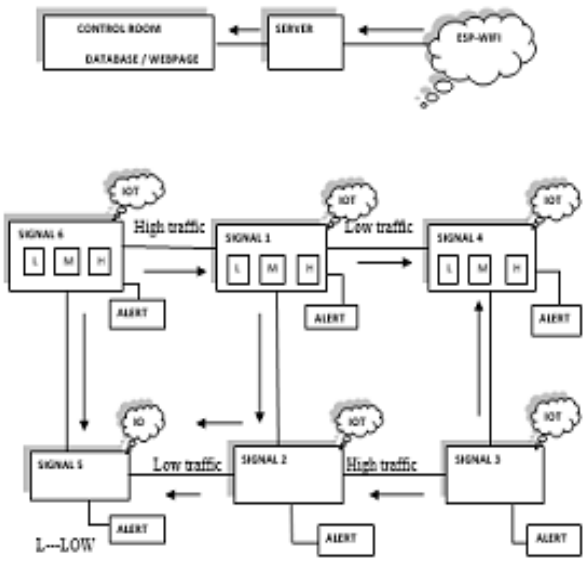

Fig. 1. Block diagram of Intelligent network traffic control system.

The remainder of the paper is organized as follows. We provide an overview of the state-of-the-art deep learning techniques which may be useful for network traffic control systems. In the deep learning enablers for network systems are discussed. Several commercially available deep learning platforms are also described in the section. Next, in the state-of-the-art deep learning applications in various networking related systems are

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extensively surveyed. In, a new application of deep learning in the network traffic control system.

II. SYSTEM OVERVIEW

The block diagram of Intelligent network traffic control system is shown in Fig. 1. Android application act as interface between smart phone and Bluetooth. Users give the input via the smart phone by using touch voice command. The android application and Arduino Bluetooth controller are the main applications for implementing the system. The voltage regulator, diodes and capacitors are being used for various control purposes Fig 1 gives the overview of the system architecture.

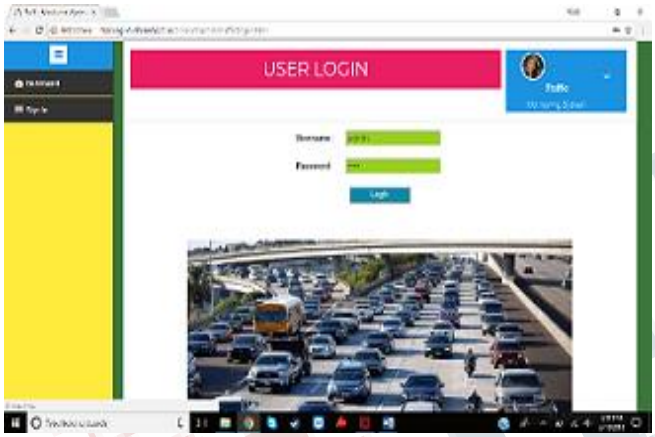

Figure 2 login page

Here first we need to connect to hardware part to the internet. Figure 2 is a screenshots of network traffic control system webpage.
Webpage:-It is a web application. As shown in the figure here users can log in.
First step is to log in to the website. Then he can status at traffic signals. By seeing the results he can choose which path to travel.

III. APPLIANCES AND APPLICATIONS IMPLEMENTED

Here this hardware part will be connected near traffic signals which will be controlled by traffic police. Here in this hardware we will be having four buttons which will indicate as low traffic, medium traffic, high traffic and alarm which will be pressed if any accident is occurred. Here when police hold this fourth button it will update the status as alert in website showing that some accident has occurred and it will directly drop a message with GPS location to nearby hospital to send a ambulance.

IV. WORKING

For using the voice commands the following steps are as follows:-
Step1:- Here traffic police will be press the relative button to update the status of traffic in website.

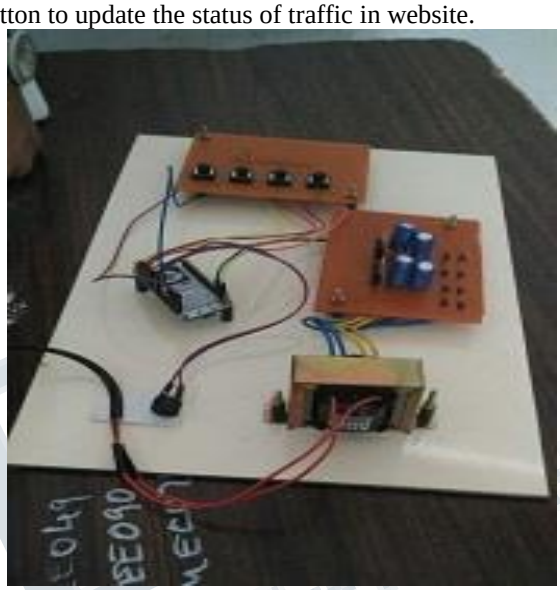

Figure 3 Hardware part

Step2:-If we are travelling we can choose the best path for travelling with low traffic and we can start our journey.

Fig: Current status at traffic signals

Step3:-Hardware parts buttons which will be connected controller will connect to internet with the help of WIFI which will help to update the status. Which is shown in below figure

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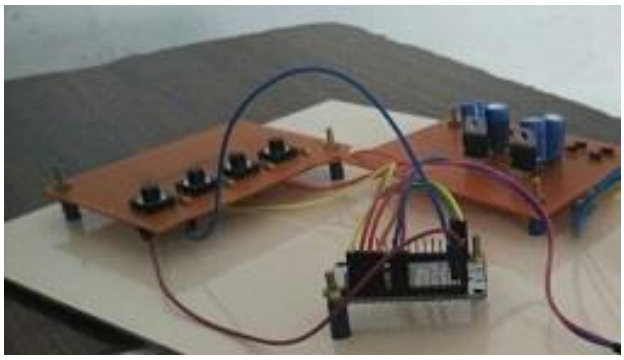

Figure Connection diagram

Step 4:- : From the serial buffer we get the stored id and passwords. Here is the code for the WIFI connection

```
void setup()

{
 Serial.begin(9600);

    delay(10);
 SPI.begin();
 // Connect to WiFi network

 Serial.println();

 Serial.println();

 Serial.print("Connecting to ");

 Serial.println(ssid);

 WiFi.begin(ssid, password);

 while (WiFi.status() != WL_CONNECTED) {
  delay(500);
  Serial.print(".");

 }
 Serial.println("");
 Serial.println("WiFi connected");
```

As shown above in the snippet we can see that at first it will begin with 9600 port with a delay of 10 micro seconds and then it will begin it will check for user id and password if the given user id and password is same then it will be connected to that hotspot.

```
const char* ssid = "iot";

const char* password = "iot12345";
```

ssid and password which is set in hardware part. Here if we find any hotspot with same ssid and password then it will be connected to that hotspot

V CONCLUSION

In conclusion, generally it helps public for travelling they can check and travel with respect to traffic signals. With this they can save there time instead of waiting in traffic jam they can check which path is better for there journey and they can travel. Even it has another feature of alarm which is fixed with buzzer which sounds indicating that some danger has occurred so better not to rush. Even it will send a alert message to nearby hospital to send ambulance with GPS location.

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