DEVICE AUTOMATION USING LI – FI

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Abstract - **This paper describes a system that is well suited for use in a small confined area with many transmitters broadcasting different signals. The transmitter of the proposed system is constructed using visible light LEDs, in which current fed to the LEDs is modulated and encoded with information or messages. The system provides signal transmission in a free space optical link. The receiver is located at some distance from the transmitters. The receiver is designed to demodulate the optically transmitted information and reproduce the messages.**

I. INTRODUCTION

Li-Fi is transmission of data through illumination by sending data through a LED light bulb. Li-Fi is the fast and cheap wireless-communication system, which is the optical version of Wi-Fi. If the LED is on, you transmit a digital 1, if it's off you transmit a 0.The LED intensity is modulated so rapidly that human eye cannot notice, so the output appears constant.

The project presented here is a approach towards vehicle navigation & safety implementation. As the title suggests, the project is aimed at automatically sensing the areas / zones like "School Zone", "Hospital zone" or "Accident Zone".

As an example, near school zone, the sign board displays "School Zone Ahead, Drive Slowly", or near a hospital, "Hospital Area-Do not Blow Horn", but in reality rarely this is practices. Drivers go at very high speed as usual near school zone, or operate the harsh horns loudly causing inconvenience to the patients in the hospital.

To provide a better alternative, one can develop a system which will automatically sense such traffic signs automatically and accordingly inform the drives and also assist him in controlling the vehicle voluntarily or forcibly.

As the whole project not just limited for these few functions, this project can be made mandatory. That way one can provide a more reliable security device and streamline traffic flow. Few additional features which can be integrated with this system are, "Down Hill Detection", "Auto-Breaking with Obstacle detection" "auto Speed limit Sensor" etc.

Another application is accident alert system where message is automatically got by vehicle which is passing nearby place, where the accident has occurred and alarm is activated. This system provides help to the needy person when accident takes place.

II. PROPOSED SYSTEM
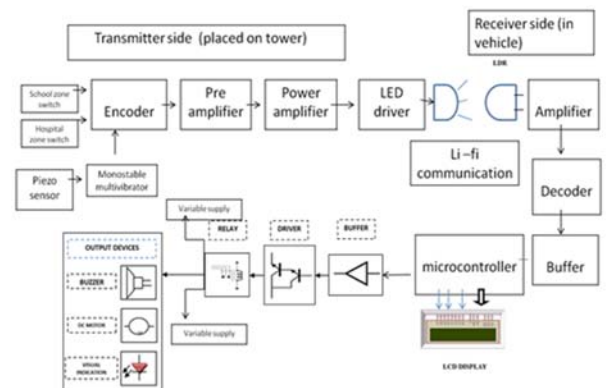
III. METHODOLOGY

The 'Smart Zone Sensing System with Automatic Control' system works as follows. Each monitoring zones are fitted with LI- FI Transmitter units with unique Identity Code. All the vehicles must be fitted with LI-FI Receiver

and respective circuitry on their vehicle's number plate. Display will be fitted on the dash board for visual representation of the alert messages sent by respective zone Transmitters.

The Radio Frequency Transmitter transmits the zone code to the receiving units. There are two zones in the present system: School Zone and Hospital Zone. Each Transmitter has carrying their own frequency. The LI-FI Receiver receives the Zone Code transmitted by the Transmitter. According to the frequency of transmitter, output pins go high. The output is fed to Buffer. This unit provides unit gain amplification to the received Zone Code signal and drives the relay for further feeding. The output of Zone Code signal is fed to Microcontroller chip as input and gets Speed Limit & Low Horn commands from it and drives the two more blocks.

For accident alert system, when accident occurs to the vehicle. And the vehicle that is passing nearby accident zone gets indication in dash board regarding the occurrence of accident and alarm gets activated. By using this system victim can get attention and help from vehicle that is passing nearby as fast as possible.

IV. HARDWARE REQUIREMENT

a. Power supply unit:

The two voltages used are +12 V & +5 V, as working voltages. Hence power supply is constructed to get regulated power supplies.

b. Buffers:

Buffers do not affect the logical state of a digital signal (i.e. a logic 1 input results in a logic 1 output whereas logic 0 input results in a logic 0 output). Buffers are normally used to provide extra current drive at the output but can also be used to regularize the logic present at an interface.

c. Drivers:

This is used to drive the relay where the output is complement of input which is applied to the drive but current will be amplified.

d. Relays:

It is a electromagnetic device which is used to drive the load connected across the relay and the o/p of relay can be connected to controller or load for further processing.

e. Indicator:

This stage provides visual indication of which relay is actuated and deactivated, by glowing respective LED or Buzzer.

f. Microcontroller:

The Atmel AT89 series is an Intel 8051-compatible family of 8 bit microcontrollers (μCs) manufactured by the Atmel Corporation. Based on the Intel 8051 core, the AT89 series remains very popular as general purpose microcontrollers, due to their industry standard instruction set, and low unit cost.

g. Li-Fi transmitter and receiver:

Li-Fi is implemented using white LED light bulbs at downlink transmitter. These devices are used for illumination only by applying a constant current. By variation of current, data speed can be enhanced.

h. DC Motor:

A **DC motor** relies on the fact that like magnet poles repels and unlike magnetic poles attracts each other. A coil of wire with a current running through it generates an electromagnetic field aligned with the centre of the coil. By switching the current on or off in coil & magnetic field is switched on or off.

i. Variable power supply:

A very good designed circuit of a regulated stable adjustable power supply using IC LM317T. LM317T supporting input voltage is from 3 volt to 40 volt DC and delivers a stable output between 1.25 volt to 37 volt DC. It is a very high performance IC contains a built in current limiter, built in thermal overload protection & safe area protection.

V. SOFTWARE REQUIREMET

Keil compiler μVision 3, Language: Embedded C.

VI. ADVANTAGES

- This application is very useful on any kind of vehicle.
- This application is easy to install and easy to operate.
- Manpower can be saved by implementing auto detecting circuits.

VII.   APPLICATION

1. The project is used to secure and avoid the road accidents.
2. It can be used as part for automation for Public Transportation.
3. Accident alert system helps the victim to get attention in time.

VIII.   CONCLUSION

LI-FI may solve issues such as the shortage of radio-frequency bandwidth and is aimed at creating new communication channels with the use of existing equipment. Currently, the LI-FI concept is attracting a great deal of interest, because it provides an authentic and very efficient alternative to wireless device which used radio spectrum.

An system made up of light emitting diode (LED) uses the visual light rays for transmitting a messages to a remotely located receiver. It has long been realized that visible light has the potential to be modulated and used as a communication channel with high entropy. This application makes use of free space as communication medium and the receiver is required to be in line-of-sight (LOS) with the transmitter.

PROTOTYPE
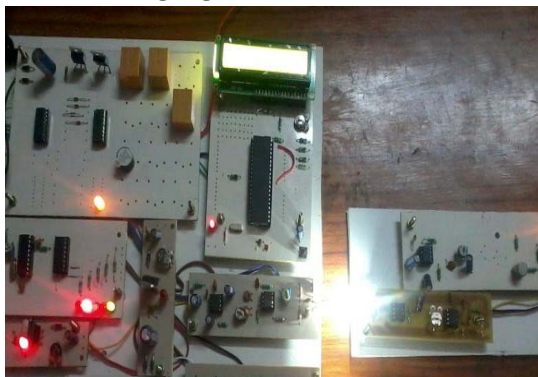
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