VIRTUAL LIGHT COMMUNICATION BASED TRAFFIC AND ROAD INFORMATION BROADCASTING SYSTEM

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ABSTRACT

This paper presents on the road safety smart system using virtual light communication (VLC). The system developed was to enhance the safety for the driver to be alert with the traffic light to avoid accident or collision. Most accident happened at the traffic light and this situation become the top reason of the accident in urban country. In addition this system are developed to offer more benefits by interfacing it with virtual light communication technology. Traffic safety information broadcast from traffic lights using Virtual Light Communication (VLC) is a new cost effective technology which can draw attention to drivers to take necessary safety measures. The new designed system are based on transceiver that using virtual light as a medium to transferring data to a receiver.

The transmitter on the traffic light and areas at risk zone will show the warning and remaining seconds of the light transition in the monitoring display in user's vehicle to alert the driver on the road condition. To achieve this, both hardware and software developed suite to its objectives to show its functionality. The main development tools used for this system are, Arduino IDE 1.0, LCD display, and photodetector.

Keyword: Arduino, IR transceiver, virtual light

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

Road accidents which cause loss of material and most importantly human lives are becoming severe even with the deployment of many intelligent communication devices on board vehicle and alongside the road. According to world health organization report [7] road crashes are the second leading cause of death globally among young people aged five to 29 and the third leading cause of death among people aged 30 to 44 years. Over 1.2 million people are killed annually because of road accidents. The study predicted that road accidents would become the sixth largest cause of death in the world in 2020 whereas it was the ninth largest cause of death in 1990. Virtual light communication (VLC) is becoming an alternative choice for the future wireless technology that offer low cost, unregulated, and harmful infrastructures support. Furthermore, the technology can be used in a wide range of applications both indoor and outdoor. Visible Light Communication (VLC) uses light for the dual role of illumination and data transmission. This paper presents the application of VLC in road safety system that can reduce the most accident causes that bring to fatality which is Red-Light running violation by sending the remaining time for the vehicle to be ready to stop and remaining time for a car to continue their journey. LED-based VLC systems can be deployed in vehicular environment on existing infrastructure such as LEDs traffic signal lights.