ABSTRACT

In recent years, Li-Fi technology has emerged as a promising alternative to traditional wireless communication systems due to its inherent advantages such as higher data rates, improved security, and immunity to electromagnetic interference. The proposed system employs Visible Light Communication (VLC) to transmit data between devices, utilizing light-emitting diodes (LEDs) as transmitters and photodetectors as receivers. Traditional RF based Vehicle-to-Vehicle (V2V) Communication System cannot be used in few restricted areas. Other RF interference will affect V2V communication at some places. RF has the potential to provide low-speed wireless communications compared to Li-Fi. Radio waves create a harmful effect for living thing. To overcome these challenges, we go for Li-Fi technology. This project presents the design of a Driver Assistance System (DAS) utilizing Li-Fi (Light Fidelity) technology for communication, integrated with Ultrasonic, MEMS (Micro-Electro-Mechanical Systems), and Alcohol sensors to enhance safety and driving experience. Ultrasonic sensors are employed for obstacle detection, providing accurate distance measurements to detect nearby vehicles, pedestrians, or objects. MEMS is used to detect the acceleration and to control vehicle. Additionally, alcohol sensors are integrated to detect alcohol levels in the driver's breathe. Integration of Li-Fi, ultrasonic, MEMS, and alcohol sensors enables holistic environmental monitoring, enhancing safety and collision avoidance. Enhancing collision avoidance systems in vehicles to reduce accidents and improve road safety. Integrating DAS into smart city initiatives to improve traffic management, pedestrian safety, and overall urban mobility. Overall, the integration of Li-Fi technology with multi-modal sensing capabilities offers a promising approach to advancing driver assistance systems for safer and more efficient transportation. VLC has a bright future ahead of it, and it complements current RF communication by increasing efficiency.