Smart Moving Vehicle For Disability Persons Using Iot And Gsm Module

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ABSTRACT: Blind and differently abled individuals encounter formidable challenges in navigating their environments independently, significantly impacting their quality of life. In response to this pressing issue, this paper presents a groundbreaking solution in the form of a specialized vehicle designed to cater to their unique needs. The vehicle boasts a myriad of functionalities meticulously crafted to offer tailored assistance and support to this demographic. Central to its design are ultrasonic sensors employed for obstacle detection and an accelerometer enabling adaptive driving, serving as indispensable aids for the visually impaired. Additionally, the vehicle integrates an innovative circuit featuring gesture recognition technology and flex sensors strategically positioned on the fingers of physically challenged patients. This arrangement facilitates the transmission of specific messages to relevant authorities via a GSM module, ensuring rapid response and assistance, even in the absence of the individual. This project represents a significant leap forward in addressing the mobility and autonomy challenges faced by individuals with disabilities, promising to profoundly impact their daily lives by enhancing their ability to navigate and interact with their surroundings with greater confidence and independence.

1. INTRODUCTION

Blindness and physical disabilities present profound challenges to individuals, significantly affecting their ability to navigate their environments independently. In the pursuit of empowering these individuals and enhancing their quality of life, technological innovations have emerged as potent solutions. This paper introduces a pioneering project aimed at addressing the unique needs of blind and differently abled individuals through the development of a specialized vehicle. The main objective of this project is to provide tailored assistance and support to individuals facing mobility challenges due to blindness or physical disabilities. The vehicle integrates advanced technologies such as ultrasonic sensors for obstacle detection, an accelerometer system for adaptive driving, and a circuit featuring gesture recognition and flex sensors. These features enable the vehicle to respond dynamically to the user's needs, offering enhanced safety, mobility, and autonomy. Furthermore, the vehicle incorporates a GSM module that enables users to convey specific messages to relevant authorities, ensuring prompt assistance and support, even in the absence of the individual. By leveraging these technologies, the project aims to address the limitations and barriers faced by blind and differently abled individuals, ultimately promoting greater independence, inclusion, and accessibility in society.

In this paper, we outline the aim and objectives of the project, detailing the design, implementation, and testing phases. Additionally, we discuss the potential impact of the specialized vehicle on the lives of individuals with disabilities and the broader implications for societal inclusion and accessibility.

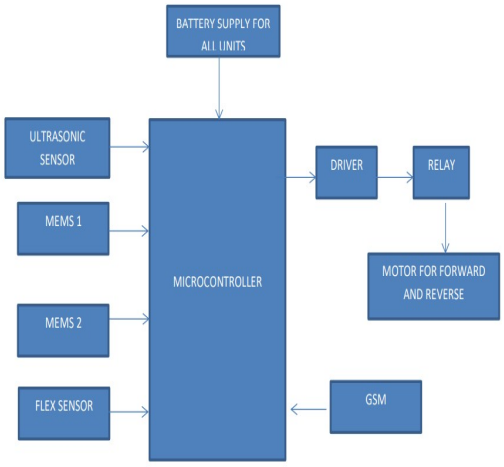
2.LITERATURE SURVEY

1. Amine Boufaied “A Diagnostic Approach for Advanced Tracking of Commercial Vehicles with Time Window Constraints”, IEEE Transactions on Intelligent Transportation Systems, VOL. 14, NO. 3, September 2013. They introduced a fleet supervision system used to monitor on road evolutions of commercial transport vehicles. This monitoring is accomplished by the automatic dispatch, during crossing of a tracking location, of information issued from the localization system on the vehicle. This information can be sent to a server through a direct Transmission Control Protocol/ Internet Protocol connection in a general packet radio service network (GPRS) or through a satellite network. The information is provided by the system to some allowed users via an Internet website. The fleet supervision system also enables analyzing messages sent by vehicles to identify differences between real data and planned data. We are more particularly interested in the diagnostics of delays, which can take place during deliveries. In fact, while crossing already fixed tracking locations, these delays are

detected as early as possible, and their consequences are predicted so that corrective or preventive actions are undertaken as soon as possible.

2.Tomohisa Harada, Isamu Takai, "Optical Vehicle-to-Vehicle Communication System Using LED Transmitter and Camera Receiver", IEEE Photonics Journal 2014.
They have developed an optical vehicle-to-vehicle (V2V) communication system based on an optical wireless communication technology using an LED transmitter and a camera receiver, which employs a special CMOS image sensor, i.e., an optical communication image sensor (OCI). The OCI has a "communication pixel (CPx)" that can promptly respond to light intensity variations and an output circuit of a "flag image" in which only high- intensity light sources, such as LEDs, have emerged. The OCI that employs these two technologies provides capabilities for a 10 Mb/s optical signal reception and real-time LED detection to the camera receiver. The optical V2V communication system consisting of the LED transmitters mounted on a leading vehicle and the camera receiver mounted on a following vehicle is constructed, and various experiments are conducted under real driving and outdoor lighting conditions..

3. N. Levy, K. Martens, "The Potential Impact of Vehicle-to-Vehicle and Sensor-to-Vehicle Communication in Urban Parking", IEEE Intelligent transportation systems magazine, may 2015.
The studied have shown that up to thirty percent of all traffic in crowded urban areas can be cruising for parking. Information provision to drivers can potentially decrease cruising time for individual drivers and subsequently improve the performance of the overall system. While most cities provide drivers with information on the occupancy rates of off-street parking facilities, information on single on-street parking places was non-existing until recently. Recent technological advances have made it possible to provide such information. The aim of this paper is to study the impacts of such bottom-up 10 information provision about on-street parking places for the individual driver as well as the system as a whole. Using an agent-based simulation model, impacts are compared between a bottom-up vehicle-to-vehicle communication strategy and a strategy that combines parking sensors and vehicle-to-vehicle communication. In the latter approach on-street parking places are equipped with sensors capable of disseminating their occupancy status. Contrary to expectations based on theory, the results show that, for both strategies, search time is barely decreased and sometimes even increased.



3.EXISTING SYSTEM

The existing equipment used in the cars is high. Installation cost and environmental hazards are high compared to proposed system.

4.PROPOSED SYSTEM:

The proposed system is a specialized vehicle tailored to meet the unique needs of blind and differently abled individuals, aiming to enhance their mobility, autonomy, and safety. It incorporates advanced technologies including ultrasonic sensors for obstacle detection and an accelerometer system for adaptive driving, enabling the vehicle to navigate safely and responsively. Additionally, a circuit featuring gesture recognition technology and flex sensors allows users to convey messages or commands, particularly beneficial for those with physical disabilities. A GSM module facilitates communication with authorities, ensuring prompt assistance in emergencies. With intuitive user interfaces and comprehensive safety features, the system provides a holistic solution to address mobility and accessibility challenges, empowering users and improving their quality of life.

COMPONENT DESCRIPTION:

ACCELEROMETER:

Accelerometers are useful for sensing vibrations in systems or for orientation applications.One of the most common inertial sensors is the Accelerometer, a dynamic sensor capable of a vast range of sensing. Accelerometers are available that can measure acceleration in one, two, or three orthogonal axes. They are typically used in one of three modes:
As an inertial measurement of velocity and position;
As a sensor of inclination, tilt, or orientation in 2 or 3 dimensions, as referenced from the acceleration of gravity (1 g = 9.8m/s2);

Principles of Operation
Most accelerometers are Micro-Electro-Mechanical Sensors (MEMS). The basic principle of operation behind the MEMS accelerometer is the displacement of a small proof mass etched into the silicon surface of the integrated circuit and suspended by small beams. Consistent with Newton's second law of motion (F = ma), as an acceleration is applied to the device, a force develops which displaces the mass. The support beams act as a spring, and the fluid (usually air) trapped inside the IC acts as a damper, resulting in a second order lumped physical system. This is the source of the limited operational bandwidth and non-uniform frequency response of accelerometers. For more information, see reference to Elwenspoek, 1993.
Types of Accelerometer
There are several different principles upon which an analog accelerometer can be built. Two very common types utilize capacitive sensing and the piezoelectric effect to sense the displacement of the proof mass proportional to the applied acceleration.
FEATURES

- Supply voltage: 12VDC
- Speed: 60rpm
- Long Lifetime, Low Noise, Smooth Motion
- Equipped with high efficiency
- APPLICATIONS
- Coin Changing equipment
- Peristaltic Pumps
- Damper Actuators
- Fan Oscillators
- Photo copier
- Ticket printer

GSM MODEM

GSM:

A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves.

A GSM modem can be an external device or a PC Card / PCMCIA C connected to a computer through a serial cable or a USB cable. A PCMCIA Card is designed for use with a laptop computer. It sho PCMCIA Card slots of a laptop computer.

A GSM modem is a specialized type of modem which accepts a SIM mobile operator, just like a mobile phone. From the mobile operator a mobile phone.

ULTRASONIC SENSOR:

GENERAL DESCRIPTION

Ultrasonic sensor emit ultrasonic pulses, and by measuring the time of ultrasonic pulse reaches the object and back to the transducer. The sonic waves emitted by the transducer are reflected by an object and received back in the transducer. After having emitted the sound waves, the ultrasonic sensor will switch to receive mode. The time elapsed between emitting and receiving is proportional to the distance of the object from the sensor.

PRODUCT DESCRIPTION

Ultrasonic transmitter emitted an ultrasonic wave in one direction and started timing when it launched. Ultrasonic spread in the air and would return immediately when it encountered obstacles on the way. At last the ultrasonic receiver would stop timing when it receives the reflected wave. The distance of sensor from the target object is calculated.

It offers excellent non-contact range detection with high accuracy and stable readings in an easy-to-use package. It operation is not affected by sunlight or black material. The supply voltage to the sensor is 5VDC. The sensor has two pins namely trig and echo which is connected to the controller to give digital input.

CONCLUSION:

In conclusion, the development of the specialized vehicle proposed in this project represents a significant step forward in addressing the unique challenges faced by blind and differently abled individuals. By integrating advanced technologies such as obstacle detection systems, adaptive driving features, gesture recognition, and communication modules, the vehicle offers a comprehensive solution to enhance mobility, autonomy, and safety for users with disabilities. The advantages of this vehicle extend beyond individual users to encompass various sectors and settings, including public transportation, healthcare, education, and emergency response. Moreover, by promoting inclusivity and equal participation in society, the vehicle contributes to creating a more accessible and supportive environment for individuals with disabilities. Moving forward, continued research, development, and implementation of such innovative solutions are essential to further improve the quality of life and opportunities for individuals with disabilities worldwide.

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