Automatic Head Light Dimmer and Noise free Horns in Automobiles

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Abstract: Now a day's accidents caused by automobiles have increased a lot, in which most of it are occurred during the night. The major cause of these accidents is due to the bright lights produced from the opposite vehicles. In order to reduce this problem we are planning to implement a system which connects vehicles using vehicle to vehicle communication(V2V) system by which two vehicles can be connected each other and the bright light of a vehicle can be switched to dim light by the driver in the opposite vehicle. At the same time noise pollution has also become a major problem caused by the automobiles. Noise pollution or noise disturbance is the disturbing or excessive noise that may harm the activity or balance of human or animal life. The source of most outdoor noise worldwide is mainly caused by machines and transportation systems, motor vehicles, aircraft, and trains. In order to reduce the noise produced by the automobile horns we are also planning to implement a noise free horn system in them. According to our system nearby vehicles can be connected to each other and when one vehicle applies a horn , a beep sound is produced inside the connected vehicles.

I. INTRODUCTION

Vehicle-to-vehicle (V2V) is an automobile innovation intended to permit automobiles to "talk" to each other. The frameworks will utilize an area of the 5.9 GHz band set aside by the United States Congress in 1999, the unlicensed frequency additionally utilized by WiFi. V2V is right now in dynamic advancement by General Motors, which showed the framework in 2006 utilizing Cadillac vehicles. Different automakers dealing with V2V incorporate Toyota, BMW, Honda, Audi, Volvo and the Car-to-Car communication consortium. V2V is otherwise called VANET (vehicular ad hoc network). It is a variety of MANET (Mobile ad hoc network), emphasis being now the node is the vehicular. In 2001, it was said in a publication that ad hoc networks can be shaped via autos and such systems can defeat blind spots, keep away from mishaps, and so on. Throughout the years, there have been impressive research and activities around there, applying VANETs for an variety of uses, running from security to navigation and law enforcement.

II. METHODOLOGY

In [1], To improve the execution of the vehicular networks, a novel network architecture utilizing the cross-layer paradigm is introduced. The architecture is called Smart Vehicular Ad-hoc Network SmartVANET architecture complies with the DSRC channel arrangement. The architecture isolates street into portions and allots an administration channel to every section. The SmartVANET joins a portion based grouping method with a cross breed Medium Access Control (MAC) component (known as the SmartMAC convention). Utilizing cross-layer mix, SmartVANET likewise gives an answer for broadcast storm issues and offers scalability.

Advantages:-SmartVANET architecture utilizes physical layer versatile equalization method to address channel weaknesses. SmartVANET utilizes non-adjacent SCHs in adjacent portions. Along these lines, it maintains a strategic distance from co-channel and contiguous channel interruption.SmartVANET is DSRC agreeable and productively uses the DSRC range. It also supports multichannel operation pro-posed in IEEE 1609.4 standard

Following are the steps involved

- Image acquisition
- RGB to gray conversion
- Image enhancement
- Image matching using edge detection

In [2], The system uses Intersection Collision Avoidance (ICA) application. This is a vehicle-to-vehicle (V2V) dedicated Short-Range Communications (DSRC) to share safety critical state information. safety is accomplished in potential collision situations by controlling the speeds of both vehicles with programmed brake and throttle orders. Programmed orders can never bring about the violation of predefined upper and lower speed limits.

Advantages:- The ICA prevent collisions at intersections after normal traffic control mechanisms have failed.I

In [3] the proposed vehicle communication management protocol utilizing DSRC and Repeater to address the core issues of vehicle safety and local dangers. The vehicles can openly connect for bringing advantages of more prominent security and efficiency. This communication can be utilized to avoid vehicles Collision, transmit data about traffic.

Advantages:-considering the Traffic management in complex junctions where we can strive for multipath path lane also

giving need for emergency vehicle to clear route at speedy time and more separation before they approach specific spot.

In [4], The protocols are Dedicated Short Range Communications (DSRC) multi-channel architecture. Scientific limits on execution of the proposed conventions are determined. Simulations are directed to evaluate the gathering reliability and channel utilization of the conventions. The affectability of the convention execution is assessed under different offered traffic and vehicular activity streams. The outcomes demonstrate the methodology is practical for vehicle security messages in DSRC.

Advantages:-The 250 byte message size is satisfactory. The 140 interferer number relates to a 4 lane highway at limit stream, with speed between 50 to 55 mph, and a message scope of 150 meters. At these speeds all light-duty traveler vehicles can stop inside 150 meters.

In [5],similarity oriented logic simplification (SOLS) strategy is proposed to completely re-use the current equipment and behavioral model is simulated using XILINX 14.1 programming and yields are confirmed utilizing XILINX VIRTEX-5 kit. This encoding method completely supports DSRC standards of America, Europe and Japan. This paper proposes the procedure to move forward dependable execution over existing DSRC systems.

Advantages :-The SOLS system disposes of the limitation on hardware use by two main methods:- area compact retiming and balance logic-operation sharing. The area-compact retiming relocates the hardware resource

In [6], it comprises of three units, the control unit, monitoring unit, and vehicle units which depend on a wireless network. The ARM CORTEX M3 microcontroller is utilized for controlling all the operations. It can be actualized in five cases:- Forward hazard warning, Traffic light timing display, Intersection collision warning, Road speed limit cautioning and Emergency vehicle cautioning.

Advantages:-can accomplish the best execution, prompting more effective utilization of wireless bandwidth. Receiving this in vehicular networks can both stay away from transmissions of emergency messages, wasting bandwidth due to unnecessary rebroadcasts and keep emergency messages from transmission impacts brought on by serious packet contention. This system helps the driver to maintain a strategic distance from backside impacts in low speeds.

In [7], Ad-hoc On-Demand Distance Vector (AODV) and Optimized Link State Routing (OLSR) routing protocols utilizing 802.11a and 802.11p as a part of a reasonable urban situation. For this correlation, five execution measurements are considered: Path Availability, End to-End Delay, Number of Created Paths, Path Length and Path Duration. Simulation results show, that for the vast majority of the metrics evaluated, OLSR beats AODV when 802.11p and that 802.11p is more productive in urban VANETs.

Advantages:-OLSR has better execution that AODV, mainly when 802.11p is utilized demonstrating that OLSR can be an option to use in VANETs.

In [8], It manufactures a model of programmed headlight dimmer. This naturally switches the high beam into low beam in this way diminishing the glare impact by detecting the drawing closer vehicle. It additionally kills the requirement of manual exchanging by the driver which is not done at all times.

Advantages:-Here a simple circuit is used to control the head lamps in automobiles.It helps to reduce the eye problems caused by light glares.

III. PROPOSED SYSTEM

Main objective of the proposed system is to vanish off the drawbacks of existing system. In the existing system what's done is that a circuit is used to switch the bright light of the own vehicle. This circuit can be used only for this particular application of dimming the headlamp. Also the vehicles cannot be connected to each other for further applications. In our proposed system we use Zigbee . ZigBee is an IEEE 802.15.4-based specification for a suite of high-level communication protocols used to create personal area networks with small, low-power digital radios, such as for home automation, medical device data collection, and other low-power low-bandwidth needs, designed for small scale projects which need wireless connection.The technology defined by the ZigBee specification is intended to be simpler and less expensive than other wireless personal area networks (WPANs), such as Bluetooth or Wi-Fi. Applications include wireless light switches, electrical meters with in-home-displays, traffic management systems, and other consumer and industrial equipment that requires short-range low-rate wireless data transfer.

So this technology can be used to connect the nearby vehicles within a range and can communicate with each other. In our proposed system we are also creating a noise free horn system. In order to reduce the noise pollution caused by the horns in automobiles we use the Zigbee to connect to the vehicles in front and send an alert as a beep sound when we apply the horn. So this system can be used to reduce the noise pollution in the traffic to a great extend .Also our proposed system can be used to reduce the accidents caused due to the night blindness caused by the bright lights

IV. MODULE DESCRIPTION

Controller: The controller performs tasks, processes data and controls the functionality of other components in the sensor node. While the most common controller is a microcontroller, other alternatives that can be used as a controller are: a general purpose desktop microprocessor, digital signal processors, FPGAs and ASICs. A microcontroller is often used in many embedded systems such as sensor nodes because of its low cost, flexibility to connect to other devices, ease of programming, and low power consumption. A general purpose microprocessor generally has a higher power

consumption than a microcontroller, therefore it is often not considered a suitable choice for a sensor node. Digital Signal Processors may be chosen for broadband wireless communication applications, but in Wireless Sensor Networks the wireless communication is often modest: i.e., simpler, easier to process modulation and the signal processing tasks of actual sensing of data is less complicated. Therefore, the advantages of DSPs are not usually of much importance to wireless sensor nodes. FPGAs can be reprogrammed and reconfigured according to requirements, but this takes more time and energy than desired.

Transceiver: Sensor nodes often make use of ISM band, which gives free radio, spectrum allocation and global availability. The possible choices of wireless transmission media are radio frequency (RF), optical communication (laser) and infrared. Lasers require less energy , but need line-of-sight for communication and are sensitive to atmospheric conditions. Infrared, like lasers, needs no antenna but it is limited in its broadcasting capacity. Radio frequency-based communication is the most relevant that fits most of its applications. The functionality of both transmitter and receiver are combined into a single device known as a transceiver. Transceivers often lack unique identifiers. The operational states are transmit, receive, idle, and sleep. Current generation transceivers have built-in state machines that perform some operations automatically. Most transceivers operating in idle mode have a power consumption almost equal to the power consumed in receive mode. Thus, it is better to completely shut down the transceiver rather than leave it in the idle mode when it is not transmitting or receiving. A significant amount of power is consumed when switching from sleep mode to transmit mode in order to transmit a packet.

External memory: From an energy perspective, the most relevant kinds of memory are the on-chip memory of a microcontroller and Flash memory—off-chip RAM is rarely, if ever, used. Flash memories are used due to their cost and storage capacity. Memory requirements are very much application dependent. Two categories of memory based on the purpose of storage are: user memory used for storing application related or personal data, and program memory used for programming the device. Program memory also contains identification data of the device if present.

Sensors: Sensors are used by wireless sensor nodes to capture data from their environment. They are hardware devices that produce a measurable response to a change in a physical condition like temperature or pressure. Sensors measure physical data of the parameter to be monitored and have specific characteristics such as accuracy, sensitivity etc. The continual analog signal produced by the sensors is digitized by an analog-to-digital converter and sent to controllers for further processing. Some sensors contain the necessary electronics to convert the raw signals into readings which can be retrieved via a digital link (e.g. I2C, SPI) and many convert to units such as °C. Most sensor nodes are small in size, consume little energy, operate in high volumetric densities, be autonomous and operate unattended, and be adaptive to the environment. As wireless sensor nodes are typically very small electronic devices, they can only be equipped with a limited power source of less than 0.5-2 ampere-hour and 1.2-3.7 volts.

Sensors are classified into three categories: passive, omnidirectional sensors; passive, narrow-beam sensors; and active sensors. Passive sensors sense the data without actually manipulating the environment by active probing. They are self powered; that is, energy is needed only to amplify their analog signal. Active sensors actively probe the environment, for example, a sonar or radar sensor, and they require continuous energy from a power source. Narrow-beam sensors have a well-defined notion of direction of measurement, similar to a camera.

V. TECHNOLOGY DESCRIPTION

Zigbee: ZigBee is an IEEE 802.15.4-based specification for a suite of high-level communication protocols used to create personal area networks with small, low-power digital radios, such as for home automation, medical device data collection, and other low-power low-bandwidth needs, designed for small scale projects which need wireless connection.The technology defined by the ZigBee specification is intended to be simpler and less expensive than other wireless personal area networks (WPANs), such as Bluetooth or Wi-Fi. Applications include wireless light switches, electrical meters with in-home-displays, traffic management systems, and other consumer and industrial equipment that requires short-range low-rate wireless data transfer.

Its low power consumption limits transmission distances to 10–100 meters line-of-sight, depending on power output and environmental characteristics. ZigBee devices can transmit data over long distances by passing data through a mesh network of intermediate devices to reach more distant ones. ZigBee is typically used in low data rate applications that require long battery life and secure networking (ZigBee networks are secured by 128 bit symmetric encryption keys.) ZigBee has a defined rate of 250 kbit/s, best suited for intermittent data transmissions from a sensor or input device

Liquid Crystal Display: Liquid Crystal Display (LCD) an electronic display module find wide range of applications. LCDs are cost-effective, easily programmable and have no limitations of displaying characters. They have two registers namely command and data. The command register stores the command instructions to do a predefined task like initializing, clearing the screen, setting the cursor position, controlling the display etc., given to the LCD. The data register stores the data to be displayed on the LCD screen. The data is the ASCII value of the character to be displayed on the LCD.

Ultrasonic sensor: Ultrasonic sensor is used in various fields of engineering to detect obstacles without any physical contact. This sensor identifies the nearby obstacles using the ultrasonic waves reflected from the surface of the obstacle. The main advantage of the ultrasonic sensor is its distinguished capability to penetrate through objects nondestructively as they propagate into the objects of any medium except vacuum. This sensor is compact, high sensitivity and detects obstacles at the ranging distance of 5m.

Microcontroller:AVRATmega32: The core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are directly connected to the Arithmetic Logic

Unit (ALU), allowing two independent registers to be accessed in one single instruction executed in one clock cycle. The resulting architecture is more code efficient while achieving throughputs up to ten times faster than conventional CISC microcontrollers. The ATmega32 provides the following features: 32Kbytes of In-System Programmable Flash Program memory with Read-While-Write capabilities, 1024bytes EEPROM, 2Kbyte SRAM, 32 general purpose I/O lines, 32 general purpose working registers, a JTAG interface for Boundaryscan, On-chip Debugging support and programming, three flexible Timer/Counters with compare modes, Internal and External Interrupts, a serial programmable USART, a byte oriented Two-wire Serial Interface, an 8-channel, 10-bit ADC with optional differential input stage with programmable gain (TQFP package only), a programmable Watchdog Timer with Internal Oscillator, an SPI serial port, and six software selectable power saving modes. The Idle mode stops the CPU while allowing the USART, Two-wire interface, A/D Converter, SRAM, Timer/Counters, SPI port, and interrupt system to continue functioning. The Power-down mode saves the register contents but freezes the Oscillator, disabling all other chip functions until the next External Interrupt or Hardware Reset. In Power-save mode, the Asynchronous Timer continues to run, allowing the user to maintain a timer base while the rest of the device is sleeping. The ADC Noise Reduction mode stops the CPU and all I/O modules except Asynchronous Timer and ADC, to minimize switching noise during ADC conversions. In Standby mode, the crystal/resonator Oscillator is running while the rest of the device is sleeping. This allows very fast start-up combined with low-power consumption. In Extended Standby mode, both the main Oscillator and the Asynchronous Timer continue to run.

Buzzer:A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke

Type of buzzers

1) Electromechanical: Early devices were based on an electromechanical system identical to an electric bell without the metal gong. Similarly, a relay may be connected to interrupt its own actuating current, causing the contacts to buzz. Often these units were anchored to a wall or ceiling to use it as a sounding board. The word "buzzer" comes from the rasping noise that electromechanical buzzers made.

2) Mechanical : A joy buzzer is an example of a purely mechanical buzzer. They require drivers.

3) Piezoelectric: A piezoelectric element may be driven by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. Sounds commonly used to indicate that a button has been pressed are a click, a ring or a beep.

LED:A light-emitting diode (LED) is a two-lead semiconductor light source. It is a p–n junction diode, which emits light when activated. When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence, and the color of the light (corresponding to the energy of the photon) is determined by the energy band gap of the semiconductor. LEDs are typically small (less than 1 mm^2) and integrated optical components may be used to shape the radiation pattern.

Crystal Oscillator:A crystal oscillator is an electronic oscillator circuit that uses the mechanical resonance of a vibrating crystal of piezoelectric material to create an electrical signal with a very precise frequency. This frequency is commonly used to keep track of time, to provide a stable clock signal for microcontrollers. The most common type of piezoelectric resonator used is the quartz crystal, so oscillator circuits incorporating them became known as crystal oscillators

Reset Function: Reset is used for putting the microcontroller into a 'known' condition. That practically means that microcontroller can behave rather inaccurately under certain undesirable conditions. In order to continue its proper functioning it has to be reset, meaning all registers would be placed in a starting position. Reset is not only used when microcontroller doesn't behave the way we want it to, but can also be used when trying out a device as an interrupt in program execution, or to get a microcontroller ready when loading a program.

Power Supply:A power supply is a device that supplies electric power to an electrical load. The term is most commonly applied to electric power converters that convert one form of electrical energy to another, though it may also refer to devices that convert another form of energy (mechanical, chemical, solar) to electrical energy. A regulated power supply is one that controls the output voltage or current to a specific value; the controlled value is held nearly constant despite variations in either load current or the voltage supplied by the power supply's energy source.

Step down Transformers: Step down transformers are designed to reduce electrical voltage. Their primary voltage is greater than their secondary voltage. This kind of transformer "steps down" the voltage applied to it. Step down transformers convert electrical voltage from one level or phase configuration usually down to a lower level.

Rectifier:A rectifier is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), which flows in only one direction. The process is known as rectification. Physically, rectifiers take a number of forms, including vacuum tube diodes, mercury-arc valves, copper and selenium oxide rectifiers, semiconductor diodes, silicon-controlled rectifiers and other silicon-based semiconductor switches.

VI. CONCLUSION

Ultimate aim of this project is to provide security to vehicles and drivers in a user friendly manner. The proposed system helps to reduce the number of accidents occurred during night due to the bright lights from the headlamps of the approaching vehicles. In the existing system connection

between vehicles are time consuming. Our proposed system solves this problem by improving the speed of connectivity between vehicles using Zigbee technology.

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