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BIKE IGNITION CONTROL USING SMART HELMET

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ABSTRACT

An accident is a specific, unexpected, unusual and unintended external action which may occur at any time or place, with no apparent and deliberate cause but with marked effects. Carelessness of the driver is the major factor of such accidents. The traffic authorities give a lot of instructions to the vehicle operators. But many of them do not obey the rules. Nowadays most of the countries are forcing the motor riders to wear the helmet. But still the rules are being violated by the users. A study on accidents occurring on different vehicles shows that the two wheelers contributed nearly 35% to the total number of accidents. In order to overcome this we introduce an intelligent Smart Helmet System, which automatically checks whether the person is wearing the helmet even before starting the two wheeler. Here we have a transmitter at the helmet and the receiver at the bike. There is a switch used to ensure the wearing of helmet on the head. The ON condition of the switch ensures the placing of the helmet in proper manner. The data to be transferred is coded with RF encoder and transmitted through radio frequency transmitter. The receiver at the bike receives the data and decodes it through RF decoder. The engine should not ON if no helmet is detected. MCU controls the function of relay and thus the ignition, it control the engine through a relay and a relay interfacing circuit.

The working of the system starts in the helmet side. When the user wears the helmet properly the Switches in the helmet gets triggered. The state of switches is encoded and transmitted by the transmitterModule. On the receiver side this information is received and decoded and then it is sent to microcontroller. If all the states of switches are on then the microcontroller activates the ignition system of the bike or else it disables the ignition system which finally does not allow the user to start the bike without a helmet.

INTRODUCTION

The major contributors to deadly accidents are two wheelers. To avoid this, helmet is made mandatory for all the bike riders. This, however, hasn't been effective because the system doesn't oblige rider to wear the

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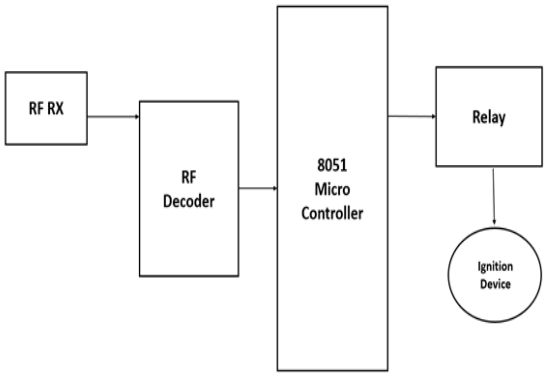
helmet. Around 17.6 million two-wheelers were sold to domestic customers in 2016/17, making it the most popular vehicle category sold in India. Two-wheeler vehicles include scooters, motorcycles and mopeds. Being the most dominant vehicle in the market two wheelers are also responsible for the majority of the deadly accidents in India. In the year 2016, Two-wheelers accounted for the highest share in total road crashes (1,62,280), contributing 33.8% of the total [1].Considering all these facts government made stringent laws regarding wearing a helmet, nevertheless, 67% Indians do not wear the helmet while riding across the country.

Even after strict obligation of helmet is imposed by the government, some bike riders don't wear helmet leading to the lethal accidents. To avoid these mishaps and to increase the safety of a rider this proposed system makes compulsion for a rider to wear a helmet. This system is divided into two working sides; helmet side and bike side. In helmet side switches are placed which actuate transmitter and this is simply read by the receiver placed at the ignition circuit. So, bike will not start unless rider is wearing the helmet. This system uses wireless communication through Radio Frequency (RF) technology.

Hence by using this system we can force the riders to wear the helmet. Even this system can be fixed with a alcohol sensor which when detects high alcohol level then also the system does not allow the user to ride the bike. In case of situation where helmet cant be worn the system can be made to allow the rider to ride the bike at preset speed limit.



An embedded system is a special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints. It is usually embedded as part of a complete device including hardware and mechanical parts. In contrast, a general-purpose computer, such as a personal computer, can do many different tasks depending on programming. Embedded systems have become very important today as they control many of the common devices we use.

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In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems — such as the operating systems and microprocessors which power them — but are not truly embedded systems, because they allow different applications to be load and peripherals to be connected.

An embedded system is some combination of computer hardware and software, either fixed in capability or programmable, that is specifically designed for a particular kind of application device. Industrial machines, automobiles, medical equipment, cameras, household appliances, airplanes, vending machines, and toys (as well as the more obvious cellular phone and PDA) are among the myriad possible hosts of an embedded system. Embedded systems that are programmable are provided with a programming interface, and embedded systems programming is a specialized occupation. Certain operating systems or language platforms are tailored for the embedded market, such as Embedded Java and Windows XP Embedded. However, some low-end consumer products use very inexpensive microprocessors and limited storage, with the application and operating system both part of a single program. The program is written permanently into the system's memory in this case, rather than being loaded into RAM (random access memory), as programs on a personal computer.

MICROCONTROLLER

Microcontroller as the name suggest, a small controller. They are like single chip Computers that are often embedded into other systems to function as processing/controlling unit. For example, the control you are using probably has microcontrollers inside that do Decoding and other controlling functions. They are also used in automobiles, washing Machines, microwaves ovens, toys….etc. where automation is needed.

The AT89S51 is a low-power, high-performance CMOS 8-bit microcontroller with 4K bytes of in-system programmable Flash memory. The device is manufactured using Atmel’s high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pinout. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a

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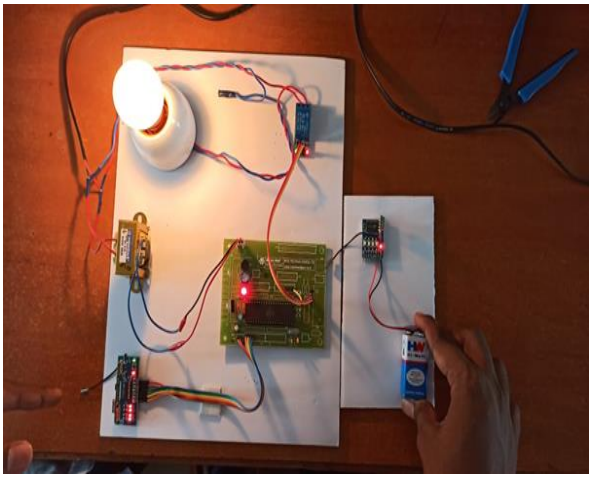
versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89S51 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications.

The AT89S51 provides the following standard features: 4K bytes of Flash, 128 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, two 16-bit timer/counters, a five vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry. In addition, the AT89S51 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power-down mode saves the RAM contents but freezes the oscillator, disabling all other chip functions until the next external interrupt or hardware reset.

WORKING ANDRESULTS



The above picture represents the working of the project. The transmitter is placed on the smaller white board and the receiver is in the bigger board. The transmitter runs on a battery whereas the receiver is powered by mains. Instead of Ignition system the receiver board controls an electric bulb.

Since the switch on the transmitter is connected the microcontroller is allowing the bulb to glow. If that switch is disconnected it turns off the bulb. In Real world application the bulb is replaced by bike ignition system and single switch is replaced by multiple switches.

CONCLUSION AND FUTURE SCOPE

With this system we can reduce the amount of damage caused by the accident for a bicycle rider. Since the bike is itself offers very less protection In case of an accident this system can be fixed with alcohol sensor

to restrict the user from driving bike with high alcohol level. It can be integrated with user's mobile phone to send messages or make a phone call if the system detects an accident. Integrating with smartphones offers us more features like Bluetooth phone calls and navigation etc.

It is proved that the risk of death while riding a bike can be reduced drastically by wearing a helmet. Inspite of governments strict rules riders are not wearing helmet which can be avoided with our system.

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