



E-MAGAZINE

Revolution Advancement in Electronics
Department of Electronics and Communication Engineering
Anantha Lakshmi Institute of Technology and Sciences

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To produce professional engineers in Electronics and Communication with Ethical consciousness to meet local and global demands.

M1: Providing an ambience of teaching-learning process through the state-of-art infrastructure and modern tools for impacting latest technical skills among the students.

M2: Providing students centric facilities and training for the students to acquire a strong collaboration with Electronics Industry.

M3: Providing value based education to find solutions for societal needs.



Program Educational Objectives (PEO's):



PEO1: Graduates can acquire the competent knowledge in Electronics and Communication Engineering.

PEO2: Graduates can have successful entrepreneurial and professional careers in the core and allied areas of electronics and communication engineering.

PEO3: Graduates can possess communication skills and work efficiently on team-based projects in electronics, communication, with a sense of social responsibility.

Program Specific Outcomes (PSO's):

Students must be able to:

PSO1: Design and develop customized electronic circuits for domestic and industrial applications.

PSO2: Analyze and design the Digital Systems in Electronics using hardware and modern tools and fulfill the gap between academics and industry.

PSO3: Apply professional ethics and ethical responsibility to a successful career in open-ended problems of Electronics and Communication Engineering by adhering to technological changes.



Advanced Helmets for Bikers for Security Measure.

IoT is the network of interconnected devices or things that are embedded with sensors, software, and network connectivity. The road mishaps are also increasing day by day, due to which many deaths occur, most of them caused by the negligence of not wearing helmets, and also many deaths occur due to lack of medical attention needed by the injured person, hence the need for a protective headgear that makes bike driving safer than before. This work is implemented by considering advanced features like alcohol detection and fall detection by using alcohol and accelerometer sensors and makes not only a smart helmet but also a feature for smart bikes. RF module is a wireless device that is used to communicate between transmitter and receiver. If the rider is found drunk, the ignition switch is locked automatically, and in event of accident, the abnormal value in accelerometer is detected and message is sent to their registered number by using GSM. Thus, if a bike rider falls from bike, the message is sent automatically, and medical attention is given immediately.



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

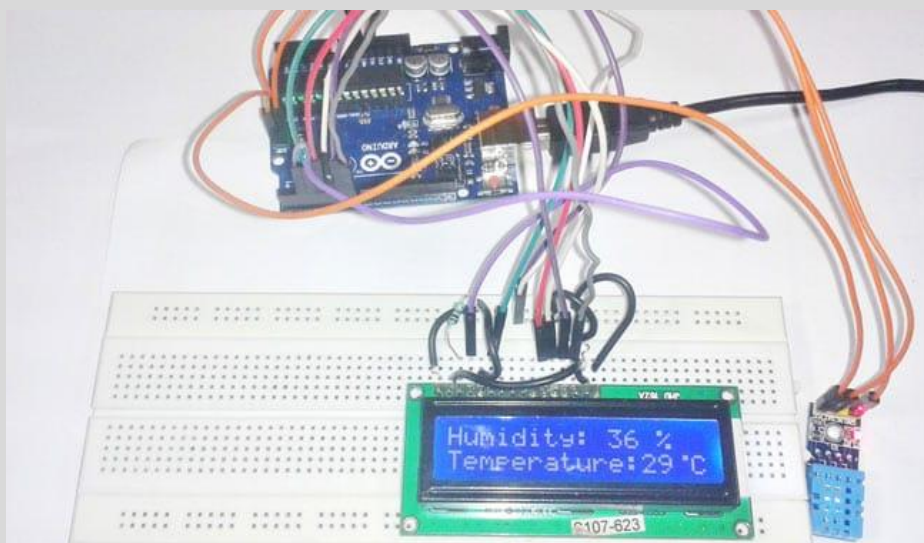
Transportation is the crucial network that makes modern society and run efficiently. In general transport corresponds to the delivery of people and goods by the use of road, rail, air, and sea. Transport sector provides various infrastructure and services for supporting transport as well as the manufacture of vehicles and equipment for monitoring and servicing transport. Nowadays cities face more dramatic challenges for managing the transport systems and its applications. An Intelligent Transportation System is an effective transportation and it combines advanced technologies like Internet of Things (IoT) and Big Data Analytics for managing traffic and mobility, better transport infrastructure and enhanced interfaces for transport services. Big data analytics is used to analyze the huge set of data while IoT is about data, devices and connectivity. IoT connects various objects through sensors, actuators, and other devices that collect and transmit data for real-time network activity. The evolution of Internet of Things will improve the mobility based intelligent transportation systems in smart cities more achievable. Major problems such as traffic congestion, accident detection, road safety, automatic fare collection and automatic vehicle parking can be resolved by using Internet of Things. The upcoming intelligent transportation systems will optimize the movement of people and goods, public safety, improving economics and the environment. In this work, IoT based intelligent transportation system can be used for providing safety and detecting bike accident using Smart Helmet. Nowadays, the number of road accidents has increased especially the bike accidents are a major part of all accidents because of bike don't have as many safety parameters compared to other vehicles. Reason for causing the bike accidents can be due to not wearing a helmet, alcohol consumption, feeling drowsy, over speed, breaking of traffic signals and careless driving. Most of the countries are enforcing their citizens to wear helmet while riding the bike and not to ride the bike when the biker has consumed alcohol, but still rules are being violated. Most Indians prefer two wheelers for their daily commute to work. Almost 33% of Indians use two-wheelers to reach work. Although the two wheelers used today are good with new and increasing features, there is an imminent need of some additional features to be incorporated for the two-wheeler riders which incorporate safety. The road mishaps are also increasing day by day, due to which many deaths occur, most of them are caused due to most common negligence of not wearing helmets, and also many deaths occurred due to lack of medical attention needed by the injured person. Hence need a protective headgear which makes bike driving safer than before. This is implemented by using advance features like alcohol detection and fall detection. This makes not only a Smart Helmet and also a feature for Smart Bike. It is mandatory for the rider to wear a helmet, without helmet ignition switch cannot be ON. RF module is a wireless small electronic device that is used to communicate between transmitter and receiver. If the rider is found drunk, the ignition switch is locked automatically and in event of accident, the abnormal value in accelerometer is detected and message is sent to their registered number by Global System for Mobile Communication (GSM). Thus, if bike rider falls from bike, the message is sent automatically and medical attention is given immediately. Nowadays the major accident is based on the reckless driving, ignorance of traffic rules and absence of protective shield and drivers drunk and drive; to rectify this in future the smart helmet is used. The helmet checks if the rider is drunk and driving. The bike starts its ignition only when the rider is non-alcoholic. Once the rider found drunk, the ignition of the bike is avoided and hence not letting the rider to ride the bike. In this work Arduino microcontroller is interfaced with alcohol sensor and it is used to monitor the biker's breath and continuously sends the signal to the microcontroller.

B Lakshmileela-202G5A0405

Temperature & Humidity Sensor

The components of the temperature and humidity sensor module mainly include a humidity sensitive capacitor and a conversion circuit. The humidity sensitive capacitor is composed of a glass substrate, a lower electrode, a humidity sensitive material, and an upper electrode.

Humidity sensitive material is a kind of high molecular polymer, its dielectric constant changes with the relative humidity of the environment. When the environmental humidity changes, the capacitance of the humidity sensitive element changes accordingly. That is, when the relative humidity increases, the humidity sensitive capacitance also increases, and vice versa. The conversion circuit of the sensor converts the change in humidity-sensitive capacitance into a change in voltage, which corresponds to a change in relative humidity of 0 to 100% RH. The output of the sensor shows a linear change of 0 to 1v.



Humidity and temperature are common parameters to measure environmental conditions. In this Arduino based project we are going to measure ambient temperature and humidity and display it on a 16x2 LCD screen. A combined temperature and humidity sensor DHT11 is used with Arduino uno to develop this Celsius scale thermometer and percentage scale humidity measurement project.

In one of my previous project, I have also developed a digital thermometer using temperature sensor LM35.

This project consists of three sections - one senses the humidity and temperature by using humidity and temperature sensor DHT11. The second section reads the DHT sensor module's output and extracts temperature and humidity values into a suitable number in percentage and Celsius scale. And the third part of the system displays humidity and temperature on LCD.

B Upendra - 192G1A0434

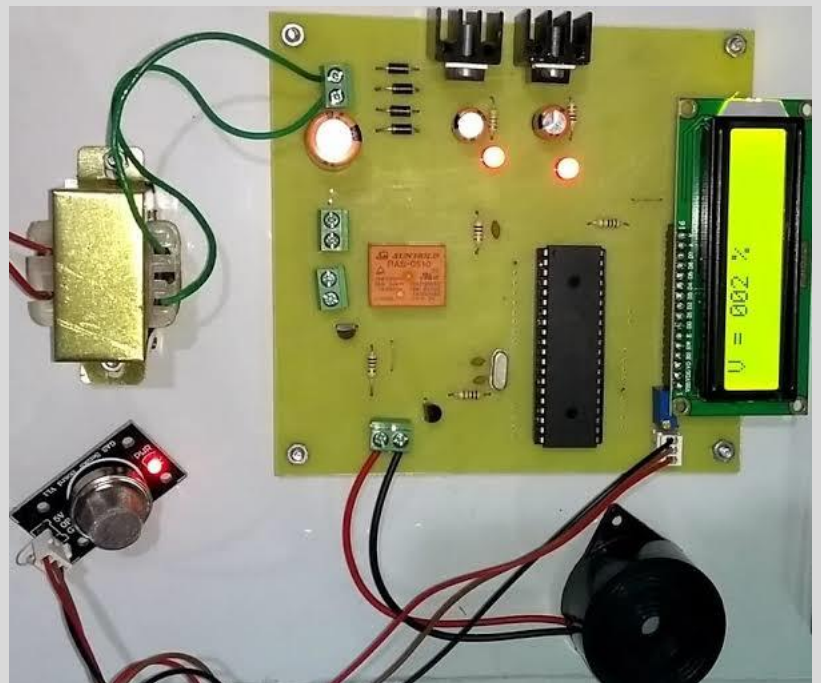
LPG leakage detector

The presence of hazardous LPG gas leakage in a domestic, work place, also, stored gases container gas which exhibits ideal characteristic is use. For that sake, an alarm unit is used to vibrate an alarm which is buzzer. Buzzer gives an audible sign of the presence of LPG volume. The sensors are widely used to detect essence of propane, iso-butane, LPG and even smoke. The sensor has an advantage to combine a sensitivity response time. If the LPG sensor senses gas leak from work place or home, sensor output goes to active low (logic-0) condition. Arduino UNO is used in the project; low signals are overlooked by the Arduino and gas leakage is been noticed by the Arduino. The Arduino UNO turns on the LCD and buzzer. It even turns on the GSM modem after that, it continues to send messages SMS to mobile number specifically mentioned in the program of the source code for alerting danger to the people.

A gas detector is a device that detects the presence of gases in an area, often as part of a safety system. A gas detector can sound an alarm to operators in the area where the leak is occurring, giving them the opportunity to leave. This type of device is important because there are many gases that can be harmful to organic life, such as humans or animals.

Gas detectors can be used to detect combustible, flammable and toxic gases, and oxygen depletion. This type of device is used widely in industry and can be found in locations, such as on oil rigs, to monitor manufacturing processes and emerging technologies such as photovoltaic. They may be used in firefighting.

Gas leak detection is the process of identifying potentially hazardous gas leaks by sensors. Additionally a visual identification can be done using a thermal camera These sensors usually employ an audible alarm to alert people when a dangerous gas has been detected. Exposure to toxic gases can also occur in operations such as painting, fumigation, fuel filling,



as painting, fumigation, fuel filling, construction, excavation of contaminated soils, landfill operations, entering soils, landfill operations, entering sensors include combustible gas sensors, photoionization detectors, infrared point sensors, ultrasonic sensors, electrochemical gas sensors, and metal-oxide-semiconductor (MOS) sensors. More recently, infrared imaging sensors have come into use. All of these sensors are used for a wide range of applications and can be found in industrial plants, refineries, pharmaceutical manufacturing, fumigation facilities, paper pulp mills, aircraft and shipbuilding facilities, hazmat operations, waste-water treatment facilities, vehicles, indoor air quality testing and homes.

C Sri Hari - 192G1A0417

Water level indicator

Here a simple circuit to control the Water pumps. When the water level in the over head tank exceeds the required level, the pump automatically turns off and stops the pumping process thus preventing the over flow of water. It uses a relay to cut off the power supply to the water pump i.e. water level is low, the input pin1 of the IC is at logic high and according to NOR gate truth table, the output at pin3 will be at logic low. Since pin3 is shorted to pins 5 and 6, hence the input to other NOR gate will be logic low signals. This gives a logic high signal to the corresponding output pin 4. As current flows through the resistor to the base of transistor, it starts conducting and acts as a closed switch. The relay connected to the collector of the transistor gets energized and the NO contacts get connected to the common contact and the water pump gets power supply from the mains and starts working.

Now when water level rises in the tank rises such that probes A and B are connected through water, current flows through them (As water is a conductor) and the pins 1 and 2 are connected through A and B to the negative supply of the battery.

The output pin3 is thus, at logic high level, causing the input pins of the other NOR gate to be at logic high level and thus the corresponding output pin4 is at logic low level. The transistor gets cutoff due to lack of bias current and the relay gets correspondingly de-energized and the power supply to the water tank gets cut off.



The ultrasonic sensor senses the level of water in the tank by transmitting ultrasonic signals towards the tank. The water in the tank reflects back the ultrasonic signals, which are received by the receiver. The ultrasonic or the sound signal received is converted to electric signal pulses which are applied to the Microcontroller. These pulses denote the level of water in the tank. As the water level decreases below certain level, the ultrasonic module gives an indication through the electric signal and the Microcontroller accordingly drives the transistor to off condition, which in turn causes the MOSFET to be switched on and accordingly the relay gets energized and the pump is switched on. In case the water level is above the threshold level, the Microcontroller accordingly switches off the relay through the transistor and MOSFET arrangement, so as to switch off the pump.

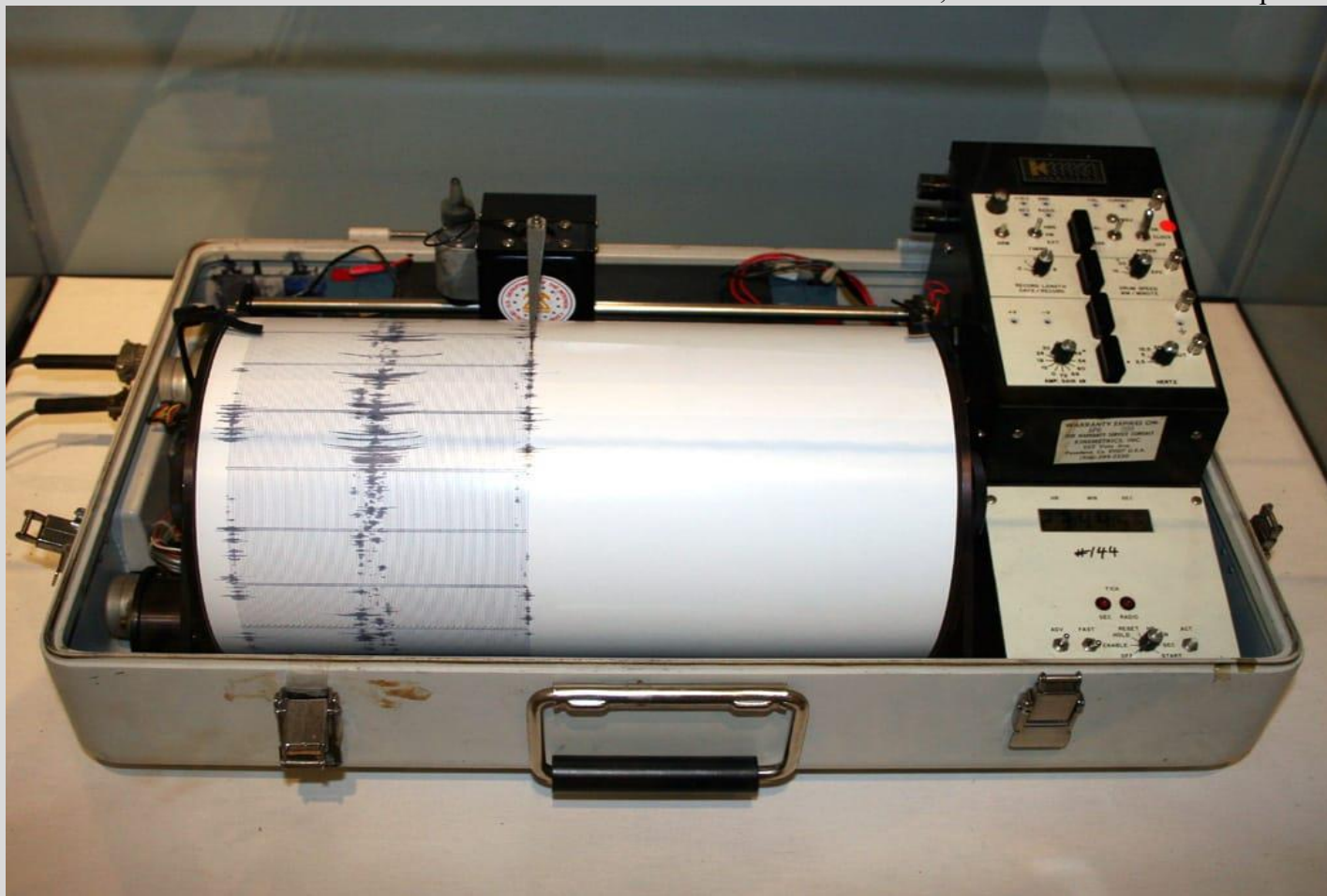
A. Naresh - 202G5A0403

Earthquake Detector

An earthquake is caused by the release of stored elastic strain energy during rapid sliding along a fault. The sliding starts at some location and progresses away from the hypocenter in each direction along the fault surface. The speed of the progression of this fault tear is slower than, and distinct from the speed of the resultant pressure and shear waves, with the pressure wave traveling faster than the shear wave. The pressure waves generate an abrupt shock. The shear waves generate periodic motion (at about 1 Hz) that is the most destructive to structures, particularly buildings that have a similar resonant period. Typically, these buildings are around eight floors in height. These waves will be strongest at the ends of the slippage, and may project destructive waves well beyond the fault failure. The intensity of such remote effects are highly dependent upon local soils conditions within the region and these effects are considered in constructing a model of the region that determines appropriate responses to specific events.

It seems that earthquakes should be predictable. After all, we can predict hurricanes and floods using detailed satellite imagery and sophisticated computer models. Using advanced Doppler radar, we can even tell minutes ahead of time that a tornado will form.

Accurate earthquake warnings are, at last, within reach. They will come not from the mechanical phenomena—measurements of the movement of the earth's crust—that have been the focus of decades of study, but, rather, from electromagnetic phenomena. And, remarkably, these predictions will come from signals gathered not only at the earth's surface but also far above it, in the ionosphere.



For decades, researchers have detected strange phenomena in the form of odd radio noise and eerie lights in the sky in the weeks, hours, and days preceding earthquakes. But only recently have experts started systematically monitoring those phenomena and correlating them to earthquakes.

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A light or glow in the sky sometimes heralds a big earthquake. On 17 January 1995, for example, there were 23 reported sightings in Kobe, Japan, of a white, blue, or orange light extending some 200 meters in the air and spreading 1 to 8 kilometers across the ground. Hours later a 6.9-magnitude earthquake killed more than 5500 people. Sky watchers and geologists have documented similar lights before earthquakes elsewhere in Japan since the 1960s and in Canada in 1988.

Another sign of an impending quake is a disturbance in the ultralow frequency (ULF) radio band—1 hertz and below—noticed in the weeks and more dramatically in the hours before an earthquake. Researchers at Stanford University, in California, documented such signals before the 1989 Loma Prieta quake, which devastated the San Francisco Bay Area, demolishing houses, fracturing freeways, and killing 63 people.

Both the lights and the radio waves appear to be electromagnetic disturbances that happen when crystalline rocks are deformed—or even broken—by the slow grinding of the earth that occurs just before the dramatic slip that is an earthquake. Although a rock in its normal state is, of course, an insulator, this cracking creates tremendous electric currents in the ground, which travel to the surface and into the air.

The details of how the current is generated remain something of a mystery. One theory is that the deformation of the rock destabilizes its atoms, freeing a flood of electrons from their atomic bonds, and creating positively charged electron deficiencies, or holes.

One of us, Freund, working at NASA Ames Research Center in Mountain View, Calif., demonstrated through laboratory rock-crushing experiments that the sundering of oxygen-to-oxygen bonds in the minerals of a fracturing rock could produce holes. These holes manage to propagate through rock up toward the surface, while the electrons flow down into Earth's hot mantle. The movement of these charges, measured at 300 meters per second in the lab, causes changes in the rock's magnetic field that propagate to the surface.

M Mohammad sazid - 192G1A0434