



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.

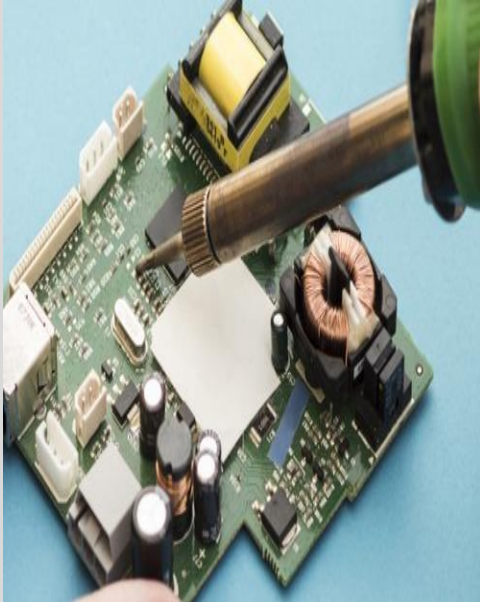
M2: Providing students centric facilities and training for the students to acquire a strong collaboration with Electronics Industry.

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



Program Educational Objectives (PEO's):

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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 communicative 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.



Android controlled robot

These are wireless communication projects which are implemented using Bluetooth technology. These are Bluetooth Based Engineering Projects Ideas. Wireless communication technique used in these projects is Bluetooth. All these projects use a Bluetooth transceiver module. This module is interfaced to a microcontroller and communicates with the 8051 Microcontroller / AVR / PIC / Arduino.

Many of these are sensor-based projects, some of them are robotics projects and some of them are related to home/industrial device control. Please click on the project title to read project details.

Bluetooth is one of the most powerful wireless communication techniques. On our website, you can find many other wireless communication projects like Zigbee, RF, DTMF and few other. However as per our analysis over past few years, Bluetooth is the mostly used in engineering projects similar to SMS based projects.



Android controlled robot project makes use of an Android mobile phone for robotic control with the help of Bluetooth technology. This is a simple robotics project using a microcontroller. We have already seen Mobile Controlled Robot using DTMF technology which uses call-based method to control the robot. Also, many wireless-controlled robots use RF modules. The control commands available are more than RF modules. Smartphone controlled robot is superior to all these robots.

This project is a Bluetooth controlled robot. For this, the android mobile user has to install an application on her/his mobile. Then the user needs to turn on the Bluetooth on the mobile. The wireless communication technique used to control the robot is Bluetooth technology. User can use various commands like moving forward, reverse, stop move left, move right. These commands are sent from the Android mobile to the Bluetooth receiver. Android based robot has a Bluetooth receiver unit that receives the commands and gives it to the microcontroller circuit to control the motors. The microcontroller then transmits the signal to the motor driver IC's to operate the motors.

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Code Modulation based Encryption & Decryption for Secured WIRELESS Communication

At present, communication technology plays a key role to make chatting from one place to another fast and easy. However, the security of the data is the main concern, so the data transmission can be done through the advanced chatting system with a microcontroller.

This project includes two sections like transmitter and receiver which are designed like a control unit in the region of a microcontroller by interfacing all the devices to it.

The main aim of the project is to transmit encrypted data using wireless communication. This data can be received by the receiver and decrypts to shown within the PC.

If a person wants to send a message to a remote location then he has to enter the data through the PC. This data can be obtained by the microcontroller and transmits to RF TX when it is encrypted. Similarly, the RF receiver gets the data to decode it & displays it through PC. So finally, code text is converted to plaintext.

Data Security is primary concern for every communication system. There are many ways to provide security data that is being communicated. However, what if the security is assured irrespective of the hackers are from the noise. This Project describes a design of effective security for data communication by designing standard algorithm for encryption and decryption.

The source information is generated by a key pad and this will be encrypted and is sent to destination through RF communication. The receiving system will check the data and decrypt according to a specific algorithm and displays on the LCD.

The RF modules used here are STT-433 MHz Transmitter, STR-433 MHz Receiver, HT640 RF Encoder and HT648 RF Decoder. RF Transmitter is connected to the different sensors through RF Encoder.

This encoder converts the 8-bit data into a single bit and sends it to the transmitter which will be transmitting. The data which is in the air is an analog value. At the receiving end, the receiver receives this analog value on a single data line and passes this data to the decoder. The decoder does the opposite functioning of the encoder i.e., it converts the single bit data into eight bit data and gives it to the microcontroller which does the further processing. This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac out put of secondary of 230/12V step down transformer.

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Smart Card Technology-Based Employee ID Cards & Access Control

A smart card looks like a plastic card that includes a chip that works like a memory otherwise a microprocessor. This chip is mainly used to store the data and process in the chip of the card.

The data in the card can be sent through a reader that is the outside component of the smart card. This is used in a wide range of areas like companies, banking, finance, healthcare, media, and entertainment. In this project, the smart card is used in employee id cards to give access to the organization. By using these cards, security can be provided to the data stored in the cards.

A smart card is a typical plastic card that contains an embedded computer chip which is either a memory or a microprocessor type. The data that the chip is responsible for storing and transmitting pertains to either value, information or a combination of both. This data is both stored and processed within the card's chip.

The card data is transmitted via a reader, which is the outward facing component of the smart card security computing system. Several systems across a wide range of commercial sectors, like banking, healthcare, finance, entertainment, and media nowadays use smart card security systems in their applications.

Applications using smart cards benefit from the several security features that these chip cards provide. The efficiency of the systems is elevated to a large extent due to the smart cards.

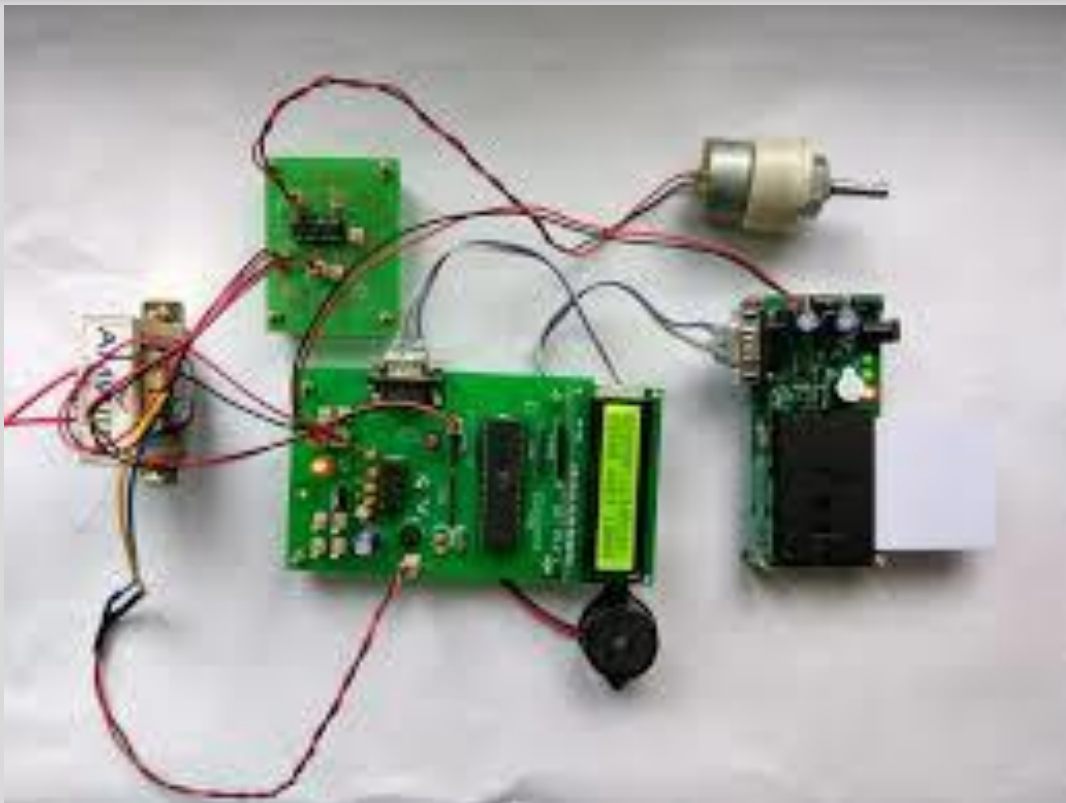
Smart Card Security Technology

The need for convenience and security of any transaction has made the deployment of smart cards highly relevant. One of the primary uses of smartcards is to provide safe storage of confidential information of users like account identity. In general, smart cards are preferred to other machine readable cards as they incur a much lower cost of maintenance. Also, unlike other card security systems like magnetic stripe cards, smart card security systems put all the necessary information and functions on the card itself. Magnetic stripe cards divide the information and function load between themselves and the reader or the central server. Thanks to this, the user does not need access to obscure databases during transaction processes.

Smart cards also facilitate the secure transaction of data through any type of virtual network. Unlike the magnetic stripes which store negligible amounts of read-only data, smart cards are fitted with microprocessors which enable the cards to receive, store, update, and make decisions about data. This means that if you've been issued a smart card, but your information gets updated, you don't need a new card, but rather can update the information straight on your existing card. This greatly reduces the risk of losing your card or misplacing the old one and compromising your security.

Also in terms of security, smart cards protect against a wide array of security threats starting from careless storage of user passwords to intricate system hackings. In a fully online system, you'll need some method of storing and remembering all your passwords, but users are often careless and misplace or share their passwords, meaning that they have to change them often or risk getting hacked. Resetting password is a highly expensive task for an organization. Thus smart card security systems offer a highly cost-effective solution for this issue. The most relevant and prominent applications of smartcard can be categorized in the following way:

1. **SIM Cards and telecommunication:** Subscriber identity module, which is required by all phone systems under the global system for mobile communication, is the most commonly used application of smartcards. The smart cards are consumed to enable the unique identifier, which is stored in the SIM card, to protect the rights and privileges of each mobile subscriber.
2. **Loyalty and stored value:** Smart cards are used as a tool of stored value, particularly, in loyalty programs across various sectors like transportation, parking, retail that track data and offer incentives to hold onto their customer bases.
3. **Securing digital content and physical assets:** In addition to providing information security, smartcards are also used to safeguard services and equipment by restricting access only to permitted users. Delivery of digital information



2. Loyalty and stored value: Smart cards are used as a tool of stored value, particularly, in loyalty programs across various sectors like transportation, parking, retail that track data and offer incentives to hold onto their customer bases.

3. Securing digital content and physical assets: In addition to providing information security, smartcards are also used to safeguard services and equipment by restricting access only to permitted users. Delivery of digital information and entertainment services is encrypted and decrypted via the smart card per of each subscriber base. Smart cards have also proved to be useful tools for machine and equipment settings in sensitive laboratories.

4. Ecommerce: Smart cards facilitate the process of e-commerce transaction by enabling consumers to securely store relevant information about purchases. For instance, the smart card stores details of personal account like credit balance as well preferences and purchasing trends of consumers. The smart cards can be used for micro-payments as well as for management of expense.

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Human Detection Robot

Human detection robot is not a new technology. Many types of human detection robots were designed depending on the application.

During the natural calamities like earthquakes, it is difficult to rescue the human beings under the buildings. Though detection by rescue team is done, it consumes a lot of time. Detection of human in appropriate time is very important in such situations. This article presents a simple human detection robot that is operated manually using RF technology.

Circuit Principle:

The main principle of the circuit is to detect the human using human detection sensor. The wireless robot is operated manually using PC. The wireless technology used here is Radio Frequency technology. The data is transmitted to receiver through RF. Using the received data, robot is operated and controlled.

Transmitter Section:

The transmitter section consists of PC, RF transmitter, MAX232IC, DB9 connector. The commands for operating the robots are transmitted using Personal computer. PC transmits the data to the RF transmitter through max232.

Max232 converts the logic levels. The logic levels of PC are in the range $\pm 3v$ to $\pm 15V$, while the logic levels of RF module is compatible with TTL. In order to convert this voltage MAX 232 is used. This is also called level converter. The T1 in pin of the MAX232 is connected to the receive pin of the DB9 which is in turn connected to the PC. The output pins are connected to the RF transmitter.

Radio frequency is the wireless technology used here to transmit the data. Several carrier frequencies were used in available modules such as 433.92 MHz, 315MHz, 868MHz, 915MHz, 2400MHz. Here the RF modules uses a frequency of 433 MHz. The DATA pin of the RF transmitter is connected to the T1 out of the MAX232. A Vcc of 5v is applied to the RF transmitter.



PIR sensor is used to detect the human beings. It is a passive sensor that does not emit any energy. It detects the human beings by sensing the infra red radiations emitted by every human being. The PIR sensor outputs a logic high value. This sensor can sense the human within the range of 20feet. They have an operating voltage of 2.2-5V. PIR sensor is connected to the Port1 of the micro controller.

L293D is a motor drive IC. This IC is required to drive the motor and also eliminates back EMF generated. This IC internally has H-bridge circuit. This has 16 pins out of which four input pins are used to drive two motors. Enables are used to enable these input pins. A supply voltage of 5v is applied at the 16th pin to operate the IC. 8th pin is applied with a voltage of 12v required to drive the motors. The L293D IC can drive voltages up to 36v. That is 8th pin can be applied with a voltage ranging from 2.4v to 36v.

Receiver Section:

The receiver section consists of AT89c51 microcontroller, L293D motor driver IC, RF receiver, motors of the robot, PIR sensor.

AT89c51 is an 8051 family microcontroller. It is an 8-bit microcontroller. It has 40pins. It has flash memory of 4K bytes.

The RF receiver module is connected to the port3 of the microcontroller. Data pins of RF receiver are connected to the receiver pin of the microcontroller. The two Vcc pins are shorted and connected to a supply of 5v. GND pins are shorted and connected to the PIR sensor.

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RF-based Wireless Weather Station

Before performing any activity which is related to the environment, knowing the weather information is essential. There are different parameters in the weather like wind speed, temperature & intensity of solar radiation. This project is designed with opt coupler, LM35 & LDR. These sensors obtained through microcontrollers like ATmega8535.

Then the sensor signal can be processed & transmitted to the processor to translate it into wind speed of the data parameter, sun intensity, and temperature. Here, KYL 1020 U plays an intermediate in between the processor and the client computer to transmit data.

Weather information is required before performing an activity, especially activities that directly relate to nature such as agricultural activities. Weather parameters are taken from the temperature, wind speed and solar radiation intensity. The system was designed with speed of optokopler as sensors, sensor LM35 as temperature sensor and sensor instensitas LDR as a measure of the sun. all sensors acquired by ATmega8535 microcontroller.

The signal from the sensor is then processed and sent to the processor board to be translated into wind speed of the data parameter, temperature, and intensity of the sun. KYL 1020 U used as an intermediary to transmit data from the processor board to the client computer. **KEYWORDS** Temperature, wind speed, solar intensity, weather station, AVR. 1.

Weather information is needed before performing an activity, especially activities that directly relate to nature such as agricultural activities. Agricultural activities may include determination of the schedule of planting, cropping patterns, planting, harvesting, processing of agricultural products to the transportation or distribution of agricultural product Of weather information is expected to assist farmers in determining the time of planting and may set the pattern of plant species that are tailored to the needs of water for crops to be grown.

Parameters are taken from the weather are temperature, wind speed and solar radiation intensity. Research on the weather station have been carried out. Ardhiany Hastuti [2007] conducted a study on the Anemometer to measure temperature and humidity digital. System design on this tool, which consists of a series of wind speed sensor, temperature sensor, and humidity.

Sensors are used as input to detect the speed (m / s), temperature (0C), and air humidity (RH%) and used as input to the microcontroller. The output of the microcontroller AT89S51 there are three kinds of data to be displayed to the LCD that is wind speed (m / s), temperature (0C), and humidity (RH%). In addition, research related to temperature have been carried out. Ambar Tri Utomo [2011] conducted a study using a microcontroller ADC to measure the temperature eight-room. Amber has been successfully used ATMEGA8535 ADC using BASCOM language.

Template design is the image position of the hole-encoder disc hole. The holes will be made as many as 60 pieces, with the distance between holes 6° obtained from the following calculation: The distance between holes = $360^\circ / \text{number of holes} = 360^\circ / 60^\circ = 6$ Here is a picture generated templates: Figure 2 Template Encoder discs on CD-ROM 8 cm diameter

Design software for the weather station is made codevision AVR with a bunch of software programming using C language support These programs are designed to be incorporated into the microcontroller memory controller located on separate chain.

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