NEXT GENERATION SECURITY SYSTEM

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ABSTRACT

In an increasingly interconnected and digital world, the need for advanced security systems has become paramountto safeguarding assets, individuals, and information from a multitude of threats. This paper presents an abstract of an advanced security system designed to provide comprehensive protection across physical, digital, and operational domains. The system integrates state-of-the-art technologies including surveillance systems with high- definition cameras and advanced analytics, biometric access control mechanisms, intrusion detection sensors, fire detection and suppression systems, and robust cybersecurity measures. Centralized monitoring and control platforms enable real-time monitoring, rapid response, and remote management capabilities, while integration andautomation enhance system efficiency and effectiveness. The advanced security system is designed to meet regulatory compliance requirements and adapt to evolving threats, ensuring the continuous protection of assets and the preservation of safety and confidentiality in various environments. All over the world, security has been a major concern in every home. Automated security systems are a useful addition to todays home where safety is an important issue. Vision-based security systems have the advantage of being easy to set up, inexpensive and nonobtrusive. Here, a security system has been developed that uses sensorsto detect any security violation and sends out the alert signal by high intensity Buzzer. In this paper it has been ensured three level security systems. NFC tag use, providing Password and PIR motion sensor. To open the doora person should provide NFC tag and password. If one of them absence the door will not open. The door will opened by servomotor with a lock coupled in its shaft. When wrong password is pressed, error text is displayed in the LCD. When an authorized person leaves the door, he has to show his tag in the reader. Otherwise the door will not close. Now if an unwanted man enters the room by password breaking or without NFC the PIR sensor works .It sounds the buzzer. NFC card reader, PIC 16F877A, Arduino Uno, PIR sensor is used for this project

.So, maximum security will be maintained in home. This security can be applied not only home but also the place where important document, file are preserved also the bank vault.

Keywords: biometric access control mechanisms, , intrusion detection sensors, firedetection , suppression systems

1. INTRODUCTION

Security is one of the major concerns today. With the advancement in technology, there is an increase in number of the robbery cases. This modern advanced security system describes an economic anti-theft setup for highly confidential areas such as defence, banks etc. It focuses on the design and development of a triple layer security system to control the increasing graph of crime. The Advanced Security System consists of three Layers: A. Keypad Lock The keypad locking system allows the user to enter the password to unlock the primary door. On successful password entry, the primary door unlocks for 5 seconds. On the other hand, if the password entered is invalid the corresponding door remains closed. B. Face Detection and Recognition In this layer, the detected faceis compared with the faces stored in the database in order to identify the person. If the detected face matches withthe database the secondary doors will open. The face detected is different and does not matches with the database,the images captured are sent to the owner. C. Laser Security System

Laser security system consists of a laser meshcreated by reflection of laser beam by mirrors. This system traps the unauthorized person inside whenever the beam between transmitter and receiver is interrupted.

2. Project overview

A **security alarm** is a system designed to detect intrusions, such as unauthorized entry, into a building or other areas, such as a home or school. Security alarms protect against burglary (theft) or property damage, as well as against intruders. Examples include personal systems, neighbourhood security alerts, car alarms, and prison alarms.

2 Some alarm systems serve a single purpose of burglary protection; combination systems provide fire and intrusion protection. Intrusion-alarm systems are combined with closed-circuit television surveillance (CCTV) systems to record intruders' activities and interface to access control systems for electrically locked doors. There are many types of security systems. Homeowners typically have small, self-contained noisemakers. These devices can also be complicated, multirole systems with computer monitoring and control. It may even include a two-way voice which allows communication between the panel and monitoring station.

3 Motion sensors are devices that use various forms of technology to detect movement. The technology typically found in motion sensors to trigger an alarm includes infrared, u ltrasonic, vibration and contact. Dual technology sensors combine two or more forms of detection in order to reduce false alarms as each method has its advantages and disadvantages. Traditionally motion sensors are an integral part of a home security system. These devices aretypically installed to cover a large area as they commonly cover up to 40 ft. with a 135° field of vision.

4 A type of motion sensor was used by the Japanese since ancient times. In the past, "(m)any people in Japan kept singing crickets and used them like watch dogs." Although a dog would bark when it senses an intruder, a cricketstops singing when approached by an intruder. The crickets are kept in decorative cages resembling bird cages, and these cages are placed in contact with the floor. During the day, the house is busy with normal daytime tasks. When activity reduces at night, the crickets start singing. If someone comes into the house at night, the floor startsto vibrate. "The vibration frightens the crickets and they stop singing. Then everyone wakes up --- from the silence. The family is used to hearing crickets at night and knows something is wrong if the crickets aren't singing. A similar observation was made in England about millers who lived in their mills. A mill wheel makes a great dealof noise, but the miller only awakens when the mill wheel stops turning. In this project, we have interfaced RFID RC522 Module with Arduino, RTC Module DS3231, and 20*4 LCD display. RFID Based Attendance System is a wonderful project for final year electronics & electrical students.

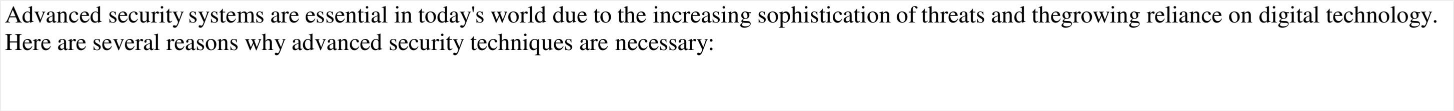
3 PROPOSED METHODOLOGY:

1. Simple system
2. Low power consumption
3. Knowledge sharing between students
4. Improve the regularity in students and good relations

3.1 OPERATION:

In this project whenever the student tap the RF id card on RF id card reader then microcontroller read hisattendance if he/her in right time and allot a set number for a week (7days) and complete data of student attendanceis stored in memory/ cloud. If any student come after timing, system shows YOU ARE LATE and doesn’t store the attendance data of that day

3.2 WORKING



Advanced security systems are essential in today's world due to the increasing sophistication of threats and thegrowing reliance on digital technology. Here are several reasons why advanced security techniques are necessary:

Safety and security of any car is one of the most primary concerns. The increasing risk of stolen vehicles and new ways of burglary have made it crucial to enhance safety. Today's security systems include immobilizers, Lo-Jack, Viper which are very costly. Thus a cost-effective and fast reactive security system is needed. Here the design is a prototype of such system which consists of door pin sensors, a microcontroller unit- Arduino Uno board and a SIM300 GSM module. Arduino Uno is the processing and controlling unit of this system which receives and processes the data from all the components. The GSM unit act as an interface between Arduino and user's mobile and is responsible for communication between them. The mobile phone can be used as a controller from anywhere in the world if the GSM network is available to switch on/ off the system and to receive the alert messages. The door pin sensor detects if any intruder enters the car. If there is a change in door pin sensor value then Arduino will be triggered and send an alert message to the mobile station

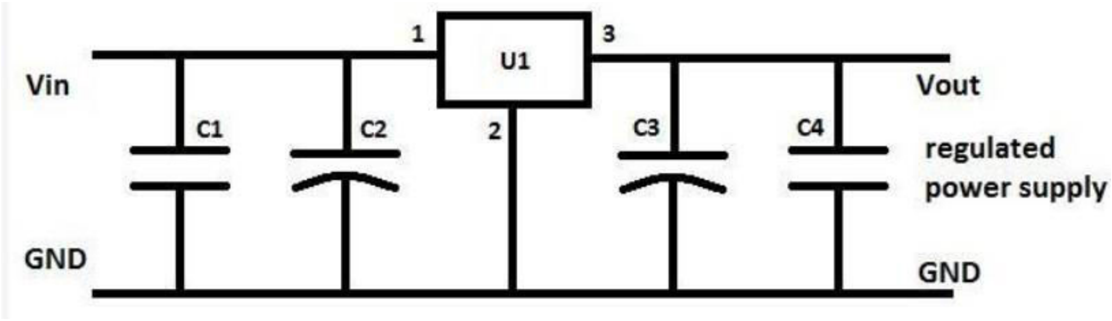


FIG1:-Circuit diagram of proposed method

4 Hardware Implementation

4.1 ARDUINO NANO

An Arduino board historically consists of an Atmel 8-, 16- or 32-bit AVRmicrocontroller (although since 2015 other makers' microcontrollers have been used) with complementary components that facilitate programming and incorporation into other circuits. An important aspect of the Arduino is its standard connectors, which let users connect the CPU board to a variety of interchangeable add-on modules termed *shields*. Some shields communicate with the Arduino board directly over various pins, but many shields are individually addressable via an I²C serial bus—so many shields can be stacked and used in parallel. Before 2015, Official Arduinos had used the Atmel megaAVR series of chips, specifically the ATmega8,ATmega168, ATmega328, ATmega1280, and ATmega2560. In 2015, units by other producers were added. A handful of other processors have also been used by Arduino compatible devices. Most boards include a 5 V linear regulator and a 16 MHz crystal oscillator (or ceramic resonator in some variants), although some designs such as the LilyPad run at 8 MHz and dispense with the onboard voltage regulator due to specific form-factor restrictions. An Arduino's microcontroller is also pre-programmed with a boot loader that simplifies uploading of programs to the on-chip flash memory, compared with other devices that typically need an externalprogrammer. This makes using an Arduino more straightforward by allowing the use of an ordinary computer as the programmer. Currently, optiboot bootloader is the default bootloader installed on Arduino UNO.[9]

At a conceptual level, when using the Arduino integrated development environment, all boards are programmed over a serial connection. Its implementation varies with the hardware version. Some serial Arduino boards contain a level shifter circuit to convert between RS-232 logic levels and transistor– transistor logic (TTL) level signals. Current Arduino boards are programmed via Universal Serial Bus (USB),implemented.

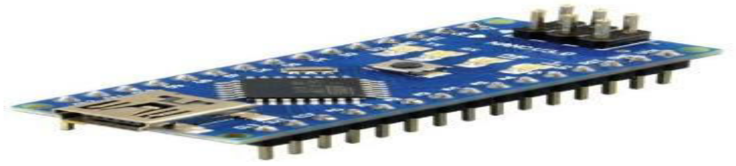


Fig 2 Arduino nano

APR9600 block diagram is included in order to give understanding of the APR9600 internal architecture. At the left hand side of the diagram are the analog inputs. A differential microphone amplifier, including integrated AGC, is included on-chip for applications requiring its use. The amplified microphone signal is fed into the device by connecting the Ana_Out pin to the Ana_In pin through an external DC blocking capacitor. Recording can be fed directly into the Ana_In pin through a DC blocking capacitor, however, the connection between Ana_In and Ana_Out is still required for playback. The next block encountered by the input signal is the internal anti-aliasing filter. The filter automatically adjusts its response according to the sampling frequency selected so Shannon's Sampling Theorem is satisfied. After anti-aliasing filtering is accomplished the signal is ready to be clocked into the memory array. This storage is accomplished through a combination of the Sample and Hold circuit and the Analog Write/Read circuit. These circuits are clocked by either the Internal Oscillator or an external clock source. When playbackis desired the previously stored recording is retrieved from memory, low pass filtered, and amplified as shown on the right hand side of the diagram. The signal can be heard by connecting a speaker to the SP+ and SP- pins. Message management is controlled through the message control block represented in the lower center of the block diagram.

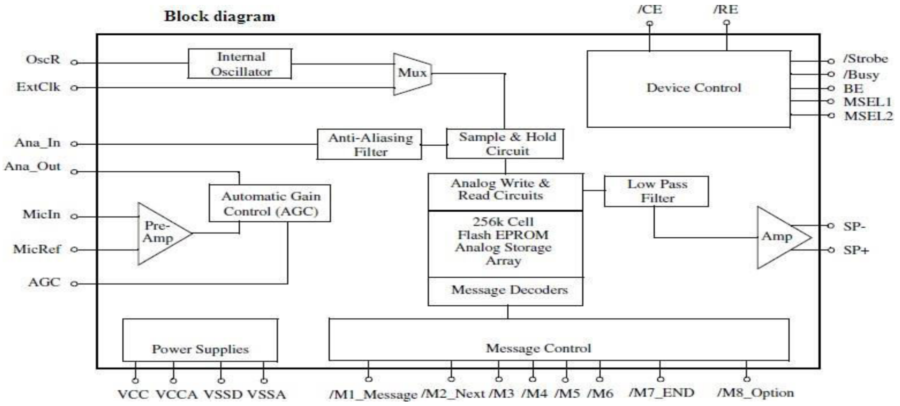


Fig 3 Block diagram of voice module

5 RESULTS AND DISCUSSION

Using the state-space averaging method, we can write:
where and are respectively the average voltage across the inductor and the switch over the commutation cycle. If we consider that the converter operates in steady-state, the average current through the inductor is constant. The average voltage across the inductor is:
The output current is the opposite of the inductor current during the off-state. the average inductor current istherefore:

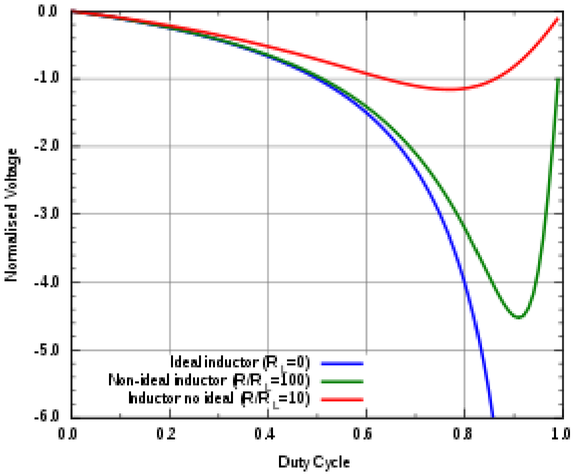


Fig 5: Evolution of the output voltage of a buck–boost converter with the duty cycle whenthe parasitic resistance of the inductor increases.

Assuming the output current and voltage have negligible ripple, the load of the converter can be considered purely resistive. If R is the resistance of the load, the above expression becomes:If the inductor resistance is zero, the equation above becomes equal to the one of the *ideal* case. But when R_L increases, the voltage gain of the converter decreases compared to the ideal case. Furthermore, the influence of R_L increases with the duty cycle. This is summarized in figure 5.

6 Conclusions

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