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AN ADVANCED VIDEO SURVEILLANCE CCTV CAMERA FOR LOCKER SECURITY AND ALERTING SYSTEM

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ABSTRACT

Today's culture places a high value on safety and monitoring. A series of recent thefts and armed robberies have highlighted the importance of implementing effective surveillance. As a result, we require a technique that is both efficient and appropriate for this specific case. A large number of people currently use security cameras to protect their homes and businesses. Nonetheless, the costs and storage capacity of these cameras are increasing as the system is monitored on a continuous basis. The Advanced Locker Security system is based on this principle and is integrated inside the locker itself, complete with an input panel. To gain access to this input interface, enter a digital password. After inputting the correct password, the locker will be unlocked immediately. When an incorrect password is entered, MATLAB will record the event using a video camera and send a text message to the locker's owner.The owner of the locker can use the camera footage stored in the computer's directory to identify the person who attempted an unauthorized entry to the locker system. This allows the tape's owner to do a retroactive investigation to determine the cause of the problem. This recommended security solution not only lowers the cost of continuous CCTV surveillance, but it also addresses the data storage issue that frequently arises when CCTV surveillance is utilized for security purposes.

***Keywords*:**Security,Surveillance,GSMtechnology,MATLAB.

I. INTRODUCTION

Everything is extremely risky right now, therefore everyone's number one priority is safety and control. A strong security tracking and management system is required for consistent, cost-effective, cross-platform theft monitoring. Electronic locking systems with passwords currently employ a security system that requires significant improvement. The reliability and safety of a process can be increased by utilizing cutting-edge digital tools. A multitude of technologies, including hand geometry, voice-based security control, and ocular recognition, have proven to be ineffective. This is because a system with only one layer of security might be compromised, and if something goes wrong, it is difficult to identify the bad guy right away. As a result, we designed our project's prototype with two levels of security that work in tandem. If an error occurs, a log will be created, and any subsequent attempts to access the container will be prevented. As part of our project, we want to employ GSM technology to create a MATLAB interface for the security system and check passwords.

In preparation for important and minor security chores, such as monitoring and bank compartments, the project is a prototype of closed-circuit television (CCTV) equipment that can automatically screen persons. The microprocessor storage system consists of pre-configured MATLAB software methods. When there is a break-in, separate jobs are assigned to each individual. Their role is to maintain the

storage system secure and to detect those who are not supposed to be there. The monitoring computer records real-time video and saves it to a designated folder. This allows the locker owner to instantly identify any unauthorized users and take action to prevent locker tampering. If an incorrect PIN or pattern is discovered, a notification is sent to the locker owner's cell phone number.

II. RELATEDWORK

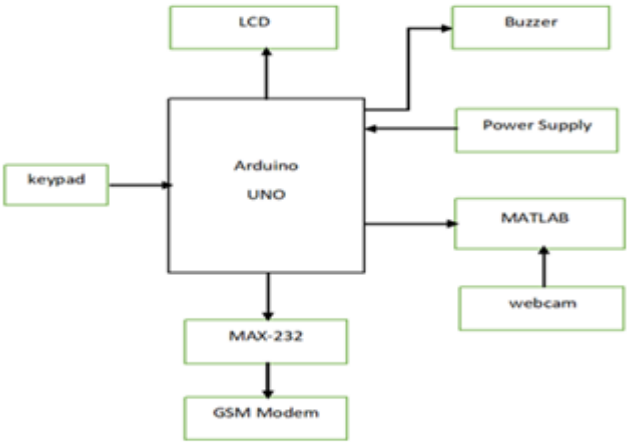
Saurabh Gupta Under the guidance of Professor Subhashish Banerjee (CSE IIT Delhi). This overhead entails collecting all possible activities that could occur in this field and creating a Finite State Machine (FSM) model that consistently recognizes routine actions while highlighting non-routine ones with a FL. Large-scale monitoring would be feasible, and the system would be simple to build if it could learn on its own.

Mritunjay Rai, Agha Asim Hussain, Tanmoy Maity and Ravindra Kumar Yadav: November 5, 2018: Advanced Intelligent Video Surveillance System (AIVSS).Video surveillance cameras improve our understanding of what is going on in the region. It has various advantages, including the capacity to record video for identification and prevention. In general, video surveillance can be regarded of as a type of video processing that gives timely changes and allows us to gather video material for further investigation.

III. PROPOSEDMETHOD

The recommended solution uses secure networking with MATLAB and a GSM module for two-way authentication. If a user enters the wrong digital password, a brief video recording is immediately created and saved to a specific folder. An unauthorized message is also transmitted to the locker owner via the GSM module. This makes it easier to do additional research.

A) BlockDiagram:-



B) HardwareRequirement:

- ArduinoUNO
- GSMSIM800
- LiquidCrystalDisplay
- Keypad
- Powersupply
- 4N35optocoupler
- DCmotor
- Buzzerandothersnecessarycomponent

C) SoftwareRequirement:

- MATLAB
- SupportingpackagesofArduinoandUSBcableinMATLAB
- PL2303prolificdriver

IV. CIRCUITDIAGRAM& COMPONENT

The primary goal was to merge the functionality of MATLAB and Arduino Uno. In order to accomplish this, we used the util module, which is part of the MATLAB addor library. The GSM900 module is connected to the 12V power source via Pin0 (the RX pin) and Pin1. Use pins 3, 4, 5, and 6 to connect the keyboard modules to the Arduino UNO. The system is presently verifying the digital password, which was entered using the keyboard. The data is shown on an LCD monitor. Pins 1 and 4 of the 4N35 optocoupler are utilized to connect to the +VCC power supply. Two and three pegs are solidly implanted. The second pin of the 4N35 optocoupler connects to the Arduino's D2 interface. Pin 4 is shared by both the 1K resistor and the BC577 transistor. The anode of the DC

motor is linked to pin 4 of the 4N35 optocoupler, and the cathode is connected to the Arduino's ground terminal.

This article provides full instructions for connecting an LCD to an Arduino UNO. Make an electrical connection between the ground and the starting electrode (VSS).Connect pin 2 (also known as VCC) to a 5 volt power supply.

An electrical current passes from pin 3 (VEE) to the base.The pin labeled "RS," often known as pin 8, is physically attached to Arduino pin 4.

To use the Arduino, connect pin 5 (R/W) to ground.Pin 6 (E) should be connected to pin 9 of the Arduino. Pins 7 (DB0) and 10 (DB3) cannot be electrically connected.

The Arduino board's pins 9, 10, 11, and 12 should be connected to pins 11, 12, 13, and 14, accordingly. The Light Emitting Diode (LED) is connected to the Arduino microcontroller's ground reference voltage and 5 volt (V) supply via two wires.

Using the PL-2303 USBtoSerial driver to connect RS-232 serial devices to a USB host computer is a very practical solution. The PL-2303 is universally compatible with all versions of Windows due to its ubiquitous USB port. By connecting this device to your primary computer via a serial port, you can establish a serial connection for communication purposes.

ComponentUsed:-

1.ArduinoUNO(R3): -

The Arduino UNO microcontroller board features fourteen digital pins and six analog pins. The Arduino board includes an 8-bit Atmel AVR processor. Your computer now has both the Arduino programmable board and the Arduino Integrated Development Environment (IDE) software loaded. This lets you program and deliver code to the Arduino UNO board. Programming microcontroller boards with C or C++ code via the Arduino IDE is a basic and straightforward process. This development board provides the ability to broadcast and receive code via USB cable.

2.Liquid-CrystalDisplay:-

An LCD, or liquid crystal display, is a flat panel screen used to show data. This structure consists of sixteen components organized into two layers. The VSS and VCC wires deliver +5V power to the LCD and serve as ground connections.VEE is used for adjusting the brightness of LCD panels.To pick the necessary register, simply select the RS (Register pick) port from the available options.The LCD can be used to broadcast and receive data via the R/W input pin. The E pin, often known as the "Enable" pin, is the input interface for receiving and saving data values. The 8-bit data ports D0 to D7 can be used to transmit and receive data to the LCD.

3.GSMMODULE(SIM800):-

Wireless modems using AGSM modules can connect to GSM cellular networks.The operation of the GSM phone network is dependent on the GPS system. The SIM800 may serve as a GSM module on four different radio channels. Aside from a UART interface, the device has a single USB connector designed particularly for software updates. AT commands are used to control and manage the SIM800 module. The host microcontroller can connect with the SIM800 module by delivering AT commands via the UART interface. GSM modules support both telephonic calls and text-based messaging. The GSM module operates with a valid SIM card given by a mobile phone service provider.

4.Keypad:-

The keyboard allows for communication between the central processing unit (CPU) and input devices. To enter a number into the computer, simply observe the LCD panel and push the appropriate numerical key. Manipulation of keys on a computer keyboard can change the significance of a numerical value.

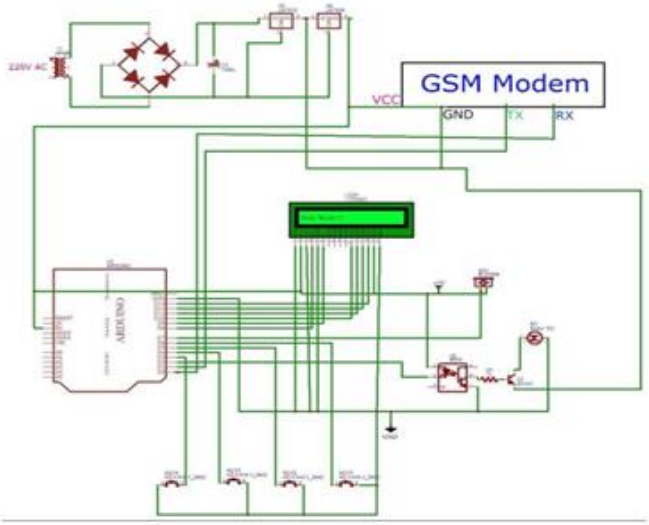
5.4N35optocoupler:-

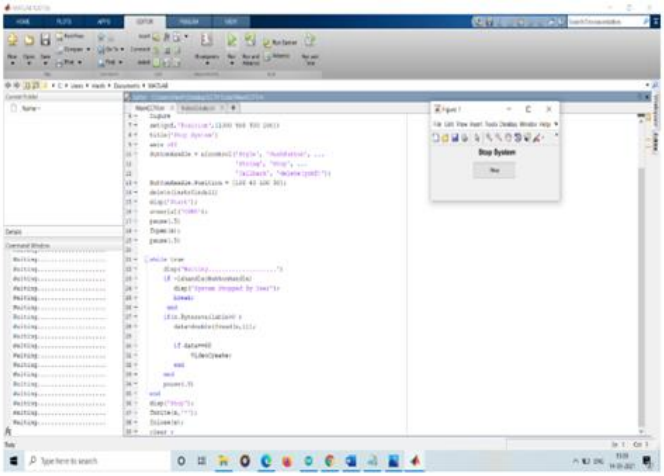
The extremely versatile 4N35 optocoupler is widely used and available in both surface mount

(SMD) and 6-pin configurations. The device consists of an infrared LED and a phototransistor.

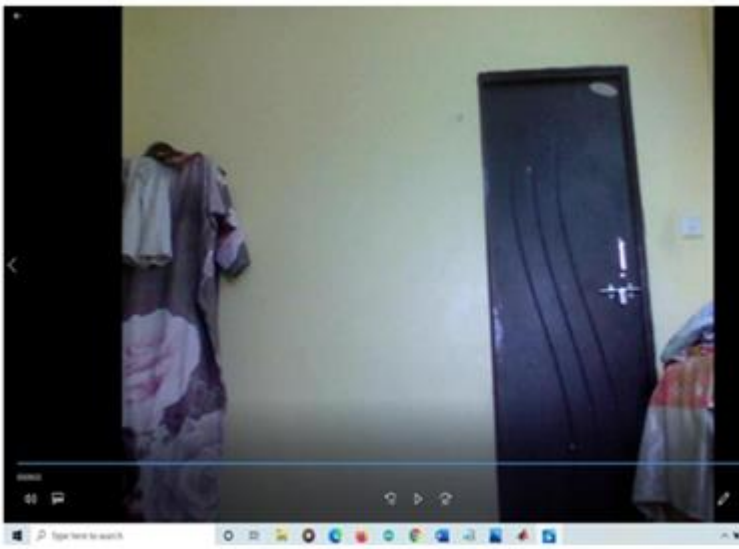
6.DCMotors:-

DC motors are highly adaptable, which makes them extremely significant in the field of motor technology.Microcontrollers are often employed as the primary approach in small to medium-sized applications that use direct current (DC) motors.





Meanwhile, MATLAB runs in the background. The microcontroller verifies the entered password before granting access to the locker. When an incorrect password is entered, MATLAB captures and saves the current scene in a defined location. If an unauthorized access occurs, the locker's owner will be notified via a GSM smartphone.



Video capture using MATLAB

V. OBJECTIVES

Objectives:

- to ensure the security of the store.
- Monitor a corridor at an office or bank.
- To deter theft, it is recommended to closely watch one's goods.
- Any problematic procedures are identified instantly, and the owner is notified by SMS.
- It is affordable, practical, and compatible with a wide range of devices.

Advantages:

- Strict security measures.
- An electronic gadget with high efficiency and low power consumption.
- Increased responsiveness and shorter reaction time.
- This is a straightforward task that requires no further guidance.
- Every piece of equipment in this business is totally automated.

➢

VI. CONCLUSION

A CCTV camera with automatic video monitoring has been installed and is now operating as part of the compartment security and alarm system. The camera is adequate, dependable, and reasonably priced. The project's anticipated outcome was achieved successfully, with no unexpected changes. A systematic strategy was used to create a container protection system employing a microcontroller-based approach. This solution streamlines the process of integrating video surveillance with MATLAB and enables the quick recording of photographs in the event of an unwanted entry. This technology can be used for a variety of security purposes and, by adding authentication and monitoring methods, decreases the possibility of theft. To further on this concept, OpenCV can be used in conjunction with image processing or artificial intelligence to provide reliable surveillance and monitoring, emphasizing the significance of this issue. Artificial intelligence (AI) technology can improve reporting and monitoring processes while also enhancing security and safety measures.

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