IOT Based Anti-Theft Security System

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Abstract: **Security and safety have always been a basic necessity for the urban population. With the rapid increase in urbanization anddevelopment of big cities and towns, the graph of crimes has also increased rapidly. By using IR blocking clothes or hiding behind objects, the basic anti-theft security system can be avoided or simply identifying and disabling them. To secure and guard our house in our absence, we propose the IOT based Anti-theft Flooring System using IOT devices.**

*Keywords***: Arduino, Internet of Things, Security, Sensor, camera, IoT, IC, Resistor.**

INTRODUCTION

Now a day's technology has become an integrated part of people's lives therefore the security of one's home, shop, or any space must also not be left behind. The purpose of this project is to design a system which will protect our house or any place from thief in our absence by using a camera module operated by Arduino. This system mainly consistsof a Web camera to detect guests, Arduino, Wi-Fi module, sensors, servo motor, resistor, ESP32 and a Mobile device for interfacing with the system. Whenever someone is entering in the house, immediately their movement will be sensed by the sensor which passes on the signal to Arduino controller. If the controller finds the request as valid after processing, then it turn on the camera which is linked to the controller to the area where the motion was detected and then sends it to the user over the Internet to check the footage. Sensors are linked to the Arduino processing unit. An input signal is generated by the sensors when they detect the motion.Once input signal is generated it will be transmitted to Arduino unit and it validates the request. Camera linked to the Arduino will capture the video based on the input signal. Video frames which are collected by the camera are transmitted to the owner over the internet using Wi-Fi module. The owner in turn can take the required action in order to protect his/her house or shop from robbery.

PROPOSED SYSTEM:

The system is made up of both hardware and softwareelements.

Hardware components:
1. Arduino
2. Resistor
3. Servo Motor
4. Piezo Sensor
5. WIFI Modem
6. ESP32
7. Camera
8. Buzzer

Language Used:
1. C++
2. PHP
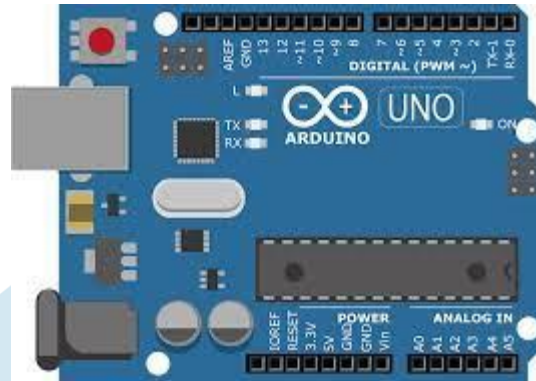3. C
4. JavaScript
5. HTML
6. CSS

Database:

1. MySQL

SOFTWARE COMPONENTS:

1.Visual Studio Code
2. Arduino IDE
3. Postman Tool

ARDUINO

Arduino is an open-source electronic device prototyping platform based on easy-to-use hardware and software. Arduino is a microcontroller-based prototyping board that can be used to develop digital devices that can read inputs such as button fingers, touch screens, turn on sensors, and convert to rotate motor. The Arduino board has a USB connector for communicating with the computer, and the motor, LED, etc. can be wired externally.

SERVO MOTOR

Servo motors are rotary actuators that provide accurate angular position control. It consists of a motor coupled to a position feedback sensor. You also need a servo drive to complete the system. The drive uses a feedback sensor to precisely control the rotational position of the motor. The servo is powered by a 6V battery pack. SG90 is a small servo motor with standard features and working. This servo motor rotates 180 degrees and 90 degrees in each direction. Controlling this motor is not too difficult as it does not require a motor controller and can be controlled with the best servo code or library for beginners. The motor comes with three arms and hardware. As a digital servo motor, it receives and processes PWM signals.

SENSOR

Sensors are devices that measure physical inputs from the environment and convert them into data that can be interpreted by either humans or machines. In this project we have use Piezo sensors. Piezoelectric sensors, also known as piezoelectric transducers, are devices that use the piezoelectric effect to measure changes in pressure, acceleration, temperature, strain, or force by converting them into electric charges. The prefix piezo is the Greek word for pressing or squeezing. The ability of a piezoelectric material to convert mechanical stress into an electric charge is called the piezoelectric effect. The piezoelectricity produced is proportional to the pressure applied to the solid piezoelectric crystalline material.

BUZZER

Audio signaling devices such as buzzers or buzzers can be electromechanical, piezoelectric or mechanical. Its main function is to convert the signal from audio to sound. Generally, it is powered by DC voltage and used in timers, alarms, printers, alarms, computers, etc. Based on different designs, you can make different sounds such as alarms, music, bells, sirens and more. The pin arrangement of the buzzer is shown below. It contains two pins, positive and negative. This positive terminal is represented by the symbol "+" or longer. This terminal is supplied with 6 volts and the negative terminal is indicated by a "-" symbol or "short circuit" and is connected to the GND terminal.
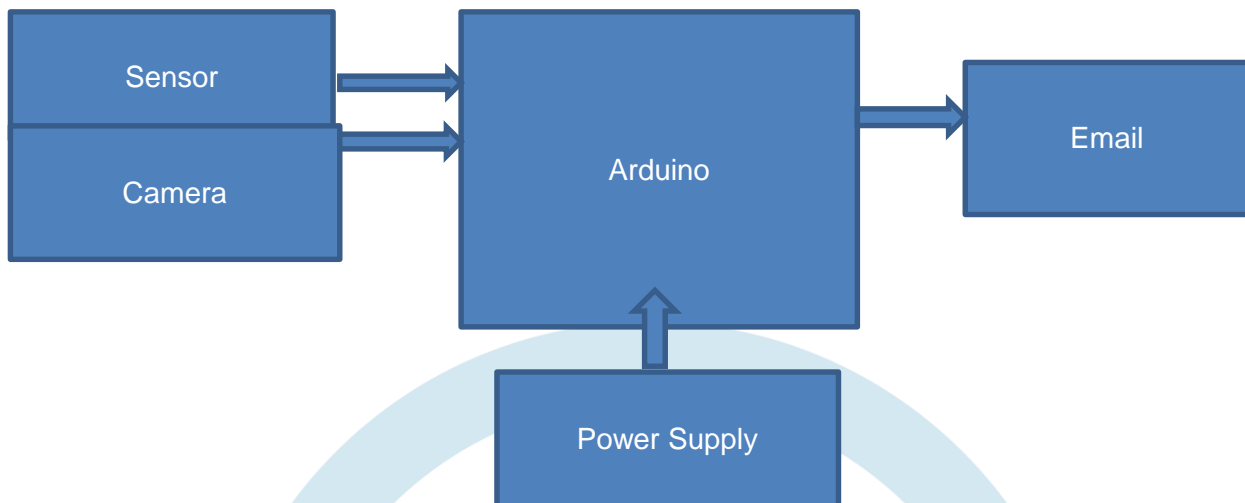

CAMERA

A Web Camera module is interfaced with the Arduino through one of USB ports in Arduino. The OpenCV library is used to provide the functionality to work with this standard web cam and the camera will be mounted on the servo motor in order to rotate in direction where the movement is detected.

The Arduino camera module can be used to take high-definition video, as well as stills photographs. It's easy to use for beginners, but has plenty to offer advanced users if you're looking to expand your knowledge. The camera is very popular in-home security applications, jewelry shops, banks and in wildlife camera traps.

WORKING

BLOCK DIAGRAM

The IoT based Security System using Arduino capture the entire floor for movement. An alert over IoT will be generated once it detects the movement on the floor. This is a secure system which is connected with IoT and it is to be turned on when we go out of home, then whoever try to enter into the house, information will be passed over the IoT. This system is powered by Arduino which is included in the security system. Whenever someone is entering in the house, immediately their movement will be sensed by the sensor which passes on the signal to Arduino controller. If the controller finds the request as valid after processing, then it turn on the camera which is linked to the controller to the area where the motion was detected and then sends it to the user over the Internet to check the footage. Sensors are placed in such a way that they are not visible to the person who is entering the house. These sensors are linked to the Arduino processing unit. An input signal is generated by the sensors when they detect the motion. Once input signal is generated it will be transmitted to Arduino unit and validates the request. Camera linked to the Arduino will capture the video based on the input signal. Video frames which are collected by the camera are transmitted to the owner over the internet using Wi-Fi module.

● Collecting input signal from the sensor and sending it to Arduino Controller for processing.
● When the signal received from the Arduino a rotation in the servo motor is generated
● Transmitting the video frames to the user over network and enabling alarm.
● An alert about an intruder is sent to the owner's device, once the system receives the signals

CONCLUSION

● This smart IOT based surveillance system is been developed with the goal to design in such a way that it can fulfill the requirement of user or an organization for particular surveillance area.
● The accuracy or performance of entire system can be measured in terms of the sensor accuracy, and face detection or recognition accuracy.
● Additional features can be added to the proposed model like electronic device control along with the home automation system by adding the additional sensors and actuators.

FUTURE SCOPE

● To add security to the device and the account of the owner.
● Making the product small enough to fit anywhere.
● Alert the owner by the notification with the person image.

REFERENCE

1.   Dr. M.Suresh, A.Amulya, M.Hari Chandana, P.Amani, T.Lakshmi Prasanna. "Anti-Theft Flooring System Using Raspberry PI Using IOT System". Compliance Engineering Journal 2021.
2.   Chalamalasetty Edward Pradeep Kumar, Goutham Prashanth V G, Manoharan E, Kesavamurthy K. "IOT based Security System using Raspberry Pi". International Journal of Engineering and Research Technology(IJERT) 2020
3.   Sonali Das, Dr. Neelanarayan V. "IOT based Anti-Theft Flooring System". International Journal of Engineering Science and Computing(IJESC) 2020