

Door Lock System with Mobile Application

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Abstract

The proposed smart door lock system utilizes an ESP32 microcontroller to enhance security and automation. The system integrates a temperature sensor, PIR sensor, display unit, relay, and an electromagnetic lock to enable secure access control using a smartphone. The PIR sensor detects motion near the door, while the temperature sensor monitors environmental conditions for additional safety measures. The relay module controls the electromagnetic lock, allowing remote or automated unlocking through a smartphone application. The display unit provides real-time status updates, enhancing user interaction. This system offers a reliable and efficient solution for modern smart home security, ensuring both convenience and safety.

Keywords: Mit App Inventor, Firebase, Piezo Sensor, Arduino Uno, ESP 32, Smartphone, and Relay

INTRODUCTION

A home protection device could be very important nowadays. In reality, this system is designed to maintain your belongings and loved ones usually secure and secure. Over the years, it has become essential to have a reliable home protection machine which can protect your property inside the nice and most secure manner possible. Many countries are step by step introducing domestic protection structures. An essential part of any domestic safety device is identifying humans getting into and leaving the house. They used extra conventional methods to comfortable their houses. Traditional protection is predicated on the usage of outside elements together with keys, passwords, and get admission to IDs. However, due to a few barriers, it's far believed that biometrics can promise one of these protection gadget. Biometric measurement is a unique and measurable authentication of identity. Biometric system calls for the use of special equipment like fingerprint scanner, DNA analyzer, and so on. Additionally, this device calls for a selected goal to attain the device so as to obtain information approximately specific functions. Biometric technology is visible as a unique, more secure verification gadget available with a higher stage of safety than conventional strategies. In addition to fingerprints, facial recognition is a popular form of biometric technology. Because the face has greater capabilities, it's miles related to greater balance. In addition, it is taken into consideration the most comfortable character's residence cannot be stolen, borrowed, or defrauded. Facial reputation is the most herbal approach for biometric verification of humans. Face popularity is the first step in a facial popularity system.

OBJECTIVE

In the age of information systems, authentication is one of the most important problems. One of the famous person authentication techniques, among other strategies, is human facial popularity (HFR). HFR is an vital a part of biometric authentication, which is extensively used in lots of packages consisting of surveillance structures and human-laptop interplay. Based on the Hara cascade technique and embedded C programming, this assignment provides an automated access door machine for facial popularity. , object detection the use of saliency-based totally Har redundancy category is a effective recognition approach proposed via Paul

Viola and Michael Jones. Using a complicated Node mcu board, it become constructed electronically, powerfully rechargeable, and operated thru USB via far flung get admission to thru the Internet. Modem Security alert emails are despatched to the user's email cope with about automated statistics. Compared to other structures in use these days, the proposed system is greater efficient, greater dependable and consumes substantially less facts and strength.

LITERATURE SURVEY

Title: 1A Review of IoT and Remote Sensing-Based Sensor Network-Based Irrigation Systems

uthors : Chenchen Liu, Saad Uddin, Muhammad Ajmal, Weimin Ru, Weidong Shi, and Muhammad Awais.

The concept for this research paintings came from developing nations, whose economies depend loads on agriculture and weather. Profitability in agricultural manufacturing relies upon on making the right and timely strategic decisions, based on cutting-edge conditions and historical statistics. Precision agriculture is a systematic application to improve agricultural productiveness by ensuring land and crop management to meet the particular wishes of every region while retaining environmental satisfactory. This studies paintings highlights the improvement of an automatic irrigation machine with a transportable sensor network and choice assist era for faraway sensing of the environment in the agricultural area. From satellite tv for pc radio, mobile cellphone, sensors, internet connectivity and microcontroller, there are environmental record gear like soil moisture, temperature, humidity and light depth. The knowledge obtained via the sensors is transferred directly to the cloud server the usage of IoT generation. Users from everywhere within the global can view them thru any tool with Internet get right of entry to. The growing use of sensors in cutting-edge agriculture makes it fee-powerful, powerful and increasing efficiency via precision farming. Previously reviewed guides mentioned diverse obstacles along with the dearth of energy in the area, which may be solved through sun panels that simultaneously rate the batteries using power. The use of Bluetooth in the agricultural quarter has been advanced particularly thru the optimization of device layout. Power Class RF can clear up transmission and ability troubles by means of the usage of a higher antenna.

Title: 2Using an Internet of Things-Based Smart Watering System to Increase Agricultural Irrigation Efficiency

Author: Thilina N. Balasooriya, Pranav Mantri, PiyumikaSuriyampola

Today, huge amounts of water are ate up in agriculture due to ineffective irrigation techniques. By controlling your soil irrigation water and pH degree, you will now not only conserve water, however also develop healthful flowers. Although many smart irrigation structures have been proposed, no structures presently proposed recall each irrigation water pH and soil moisture. This take a look at solves a web-based totally clever irrigation machine (IBSWS) that solves each issues by collecting real-time information from pH and soil moisture sensors and processing it in a cloud-primarily based microcontroller surroundings. This alone enables in tracking the moisture and pH degree often. Additionally, IPSWS introduces a cellular application for farmers to apply as a device to screen and control irrigation structures and crop conditions. The IBSWS prototype demonstrates that Wi-Fi sensors and microcontrollers may be used in a cloud-prepared surroundings to manipulate any such system and control crop irrigation as it should be.

Title: 3 AUTOMATION OF IRRIGATION SYSTEM USING IoT**Author: PavankumarNaik, ArunKumbi, KirthishreeKatti, NagarajTelkar**

India is specifically agricultural. Agriculture is the most crucial career for Indian households. It plays an crucial role in the development of the united states's agriculture. Agriculture contributes sixteen% to India's GDP and 10% to all exports. Water is an critical resource for agriculture. Irrigation is a way of providing water, but in some cases a number of water is fed on. In this regard, we proposed a venture called "Automated Irrigation System using the Internet of Things" to keep water and time. In the proposed machine, we use diverse sensors including temperature, humidity, soil moisture sensors that measure various soil environments and based totally at the soil moisture fee, routinely on/off the system and irrigate the soil. These parameters are measured and the tool reputation is displayed in the Android user software.

Title: 4Edge Computing and Internet of Things-Based Intelligent and Smart Irrigation System

Author: Safdar Munir, ^IImran Sarwar Bajwa, ^IAmna Ashraf, ^IWaheed Anwar, ^Iand Rubina Rashid

Smart and price powerful irrigation structures were developed to fulfill the clean water desires of the sector's populace. In other words, financial intake of water must be sufficient to preserve scarce freshwater assets. Most of the water is wasted due to inefficient irrigation systems. We used sharp awareness to apply ontologies for 50% of decision making, at the same time as the last 50% of choices are based totally on sensor facts values. The result of the ontology and the sensor values turns into the supply of the very last output from the system mastering algorithm (KNN). The part server is also added between the main IoT server and the GSM module. This method now not only avoids overloading IoT servers for data processing, however additionally reduces latency. This approach connects the Internet to a community of sensors to acquire all of the statistics, analyze the statistics at the threshold server, switch only a few particular facts to the main IoT server, and predict the irrigation wishes of the crop area. Conclusion used within the Android Edge utility.

EXISTING SYSTEM

In the contemporary gadget we use a password door lock system that continually activates the person for the password. Therefore, we evolved a brand new face recognition system to conquer this shortcoming. On current computers, facial recognition can be performed via a USB camera on the Raspberry Pi. We have carried out a facial recognition device for door locks as according to the plan. Passwords and facial popularity work properly. The host has a high accuracy of facial reputation, and it could recognize and ship a facial photograph to every other Raspberry Pi on the proper time and produce a good result. It takes effort and time. We were all delighted. This is achieved inside the Python programming language. This software need to deploy OpenCV on Ubuntu. This software program need to be tough to apply.

Disadvantages of Existing System

- Restricted offline access. Some clever door locks may have restrained capability or lack get right of entry to manipulate whilst there is no net connection, which may be intricate through soccer.
- Connection established: Smart gateways rely closely on net connectivity. If the net is going down or there are network issues, users may also find it difficult to get admission to their home.

PROPOSED SYSTEM

The proposed machine additionally consists of a facial recognition door access gadget and an digital alarm gadget. In this system we are able to use Nodemcu and Pixy Cam, due to the fact the actual time manipulate unit may be very correct. The machine is used to govern access to the hair gate house based totally on facial reputation generation through looking at the marked facial photographs. The details associated with the linked information may be notified while someone is efficaciously identified via the introduction of the

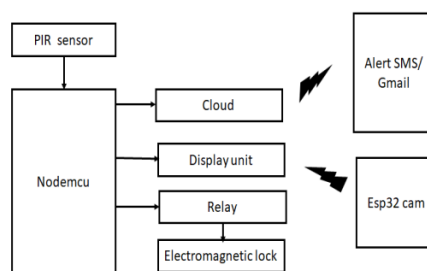
intended cope with. Facial reputation is one of the many ways to become aware of humans. Several methods may be used for this purpose. Some of the maximum common makes use of are PCA or Eigenfaces. Although other new methods are simpler to understand and put in force, their overall performance is a great deal better. The Haar Cascade Algorithm is such an set of rules. As we've shown, Haar cascades are very efficient and really accurate.

Advantages of Proposed System

- Real-time monitoring and signals of any tasks or suspicious sports out of doors.
- Integration with safety systems to trigger alarms or notifications in the event of a security breach.
- Eliminate the need for classic bodily keys, lowering the danger of key loss or unauthorized duplication.
- Access through PIN code, biometric authentication or virtual key for brought protection.

BLOCK DIAGRAM

Block diagram:



SYSTEM REQUIREMENTS

Hardware Requirements

The Intel Core i5 processor is the system.

Hard disk capacity: 1000 GB.

Monitor: 15-inch LED

Devices for Input: Keyboard and Mouse

8 GB Ram, PIR Sensor, NODE MCU, ESP32Cam, Relay, and Display Unit

Electromagnetic timepiece.

Software Requirements

System of operation: Windows 10.

Language of Coding: Embedded C

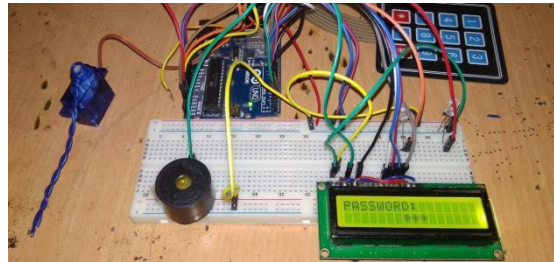
MODULES AAND THEIR DESCRIPTION

Module1: Get the connections ready and give the connections to the Arduino Microcontroller.

Module2: get the data from the Arduino Microcontroller.

Module3: interfacing the GPS and Arduino Microcontroller.

RESULT AND DISCUSSION



What is the future of smart locks?

Future clever locks will encompass capabilities like facial reputation, fingerprint scanning, and integration with other Internet of Things gadgets. Additionally, we will expect an improved consciousness on statistics safety and privacy with the development of clever generation.

CONCLUSION

The proposed technique changed into effectively used for fingerprint popularity and door control algorithm the usage of Arduino microcontroller. The targets were effectively executed.

The simulation shows how our version will paintings in real time. This layout will become a small advantage for the stop user. Because era lets in them to be possible Look on the doorways, it makes it secure. You don't need to convey your keys with you all the time. Is going It is also very useful for projects, home fencing structures. No fear of dropping keys and getting locked out. I wish that there's no worry, whether or not I will open the gate or not.

FUTURE SCOPE

Today there are numerous locks and smart devices for domestic safety, but maximum of them have some problems with the high charge and inconvenient operation, which require a variety of education and time to apply, which is one of the fundamental traits. , Innovation is to be had to all. With the first-rate device used, many improvements brought to the prototype version can significantly gain the community. Extensions to the app can see who comes through the door, including a camera and sending a circulation immediately to the cell tool. Voice commands also can be delivered to enhance security. Thanks to movement detection, if a person walks to the door for a long time, the digicam will document the recording or ship it to the telephone. If a person tries to interrupt down the door, the shifting elements may even resonate.

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