ATTENDANCE MANAGEMENT SYSTEM

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Abstract——**In the modern world, tracking student attendance is crucial to raising the standard of the educational system. The typical attendance procedure is time-consuming and tiresome for the lecture. There is hence a need for an ESP32 camera-based RFID-based Face detection attendance recording system. We use a web camera technology based on ESP 32 in the suggested system. During the registration procedure, the student's photograph is taken and recorded in the database together with all the pertinent and private information. The student image is taken in order to determine attendance, and the database is then queried for the relevant information. The administrator updates the database with the daily attendance. When the specific student's photograph is taken,following which the database is queried for the information. The database may receive updates on student attendance and communicate information on attendance. The suggested attendance recording method is found to be more precise and efficient in a controlled setting. The resolution of the camera utilized, the number of pupils, and the effectiveness of the suggested attendance system are all fully dependent on each other.**

Keywords—ATMEGA 328, ESP32 Camera module, RFID Reader, Node MCU, Internet Of Things ,LED

I. INTRODUCTION

The face is the identity of a person. The tactic is to take advantage of this physical feature and have seen a decent change since the looks of image processing techniques. The attendance is taken in every school, college and library. Traditionally the professor calls the student's registered number and record attendance or from the sudden breakout of coronavirus brought various changes in everyone's life. Most of the offices and institutions were closed for many days. In many of the institutions and colleges the most preferred attendance system is based on the biometric system. If an infected employee unknowingly touches the biometric system to mark attendance, which infects the system and has a chance to spread the virus rapidly in present times, face recognition has become one in every of the best technologies for computer vision. Face recognition is always a difficult task in computer vision, illumination, pose, face expression. Face recognition tracks target objects in live video images produced by video cameras. In simple words, it is a system application for automatically identifying a person from a still image or video frame. During this project idea we proposed an automatic face recognition system..

II. PROPOSED SYSTEM

A. Problem Statement

In recent times, the student attendance has been manually updated and preserved in the system at the specific college server.The face detection-based attendance system that addresses some of the issues caused by the new virus corona outbreak is the major topic of this proposal.This face detection-based attendance system does not require anyone to be in touch with the fingerprint reader module, unlike biometric attendance systems, which lowers the rise of corona instances in turn.

B. Block Diagram
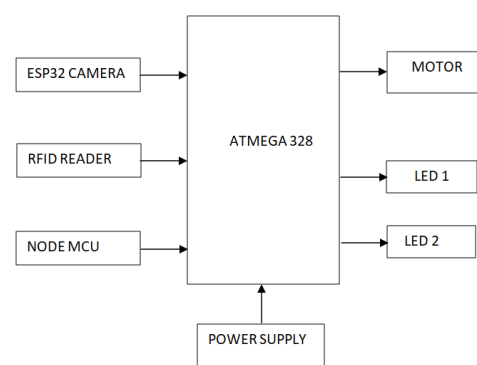
III. HARDWARE DESCRIPTION

1. ESP 32 Camera Module

The ESP32-CAM is a small size, low power consumption camera module based on ESP32. It comes with an OV2640 camera and an ESP32-CAM-MB micro USB to serial port adapter. The ESP32-CAM can be widely used in intelligent IoT applications such as wireless video monitoring, WiFi image upload, QR identification, and so on.The ESP32-CAM is an Original ESP32 CAM WiFi+Bluetooth module board along with OV2640 Camera Module**.** This product is based on the ESP32 chip with the additional facility of using a camera. That means, the features of ESP32, especially the Bluetooth and the WiFi connectivity is available along with an additional peripheral OV2640 camera module. This opens up a lot of applications and usage in the field of various IoT applications**.** For the camera spec, it is a very small sized camera yet powerful that can be used with minimum system support. It is available in a ribbon cable formation. The camera is powered by an UXGA resolution of 1600 x 1200 resolution with 2.0 Megapixel resolution. It is a good choice for most of the camera based IoT applications.

2.Atmega 328:
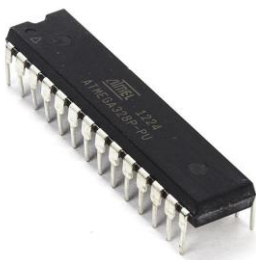
The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means "One" in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward The Uno is the latest

in a series of USB Arduino boards, and the reference model for the Arduino platform.

3.RFID Reader:

RFID (radio frequency identification) is a form of wireless communication that incorporates the use of electromagnetic or electrostatic coupling in the radio frequency portion of the electromagnetic spectrum to uniquely identify an object, animal or person. Every RFID system consists of three components: a scanning antenna, a transceiver and a transponder . When the scanning antenna and transceiver are combined, they are referred to as an RFID reader or interrogator. There are two types of RFID readers, fixed readers and mobile readers. The RFID reader is a network-connected device that can be portable or permanently attached. It uses radio waves to transmit signals that activate the tag. Once activated, the tag sends a wave back to the antenna, where it is translated into data. The transponder is in the RFID tag itself. The read range for RFID tags varies based on factors including the type of tag, type of reader, RFID frequency and interference in the surrounding environment or from other RFID tags and readers. Tags that have a stronger power source also have a longer read range.

4.Node MCU32

The NodeMCU32 38 pin is a microcontroller development board based on the ESP32 chip.It has a built-in Wi-Fi module.It is easy to use to connect internet and other devices.This NodeMCU32 has 38 pins,including variety of input output pins,analog pins,power pins.It is programmed using the arduino programming language and can be used for a variety of projects such as IOT(Internet of Things) applications,home automations and robotics.The NodeMCU32 38 pin is compatible with range of sensors and actuators,allowing you to create avoid range of projects.

B. SOFTWARE IMPLEMENTATION

1. Arduino IDE:
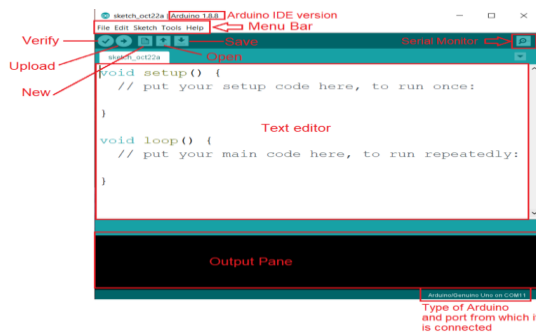
ArduinoIDE IDE stands for ―Integrated Development Environment‖:it is an official software introduced by Arduino.cc, that is mainly used for editing, compiling and uploading the code in the Arduino Device. It is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++.Arduino IDE is an open source software that is mainly used for writing and compiling the code into the Arduino Module. Itihaas serial monitor mainly for interacting with the Arduino board using the computer, and is a great tool for real-time monitoring and debugging.

VI. RESULT

VII. CONCLUSION

The RFID-based Attendance Management System with Face Detection offers an efficient, accurate, and secure solution for attendance management. Its ability to automate the process, ensure authentication through face detection, and provide real-time data makes it a valuable tool for organizations seeking to improve attendance tracking and streamline administrative tasks. Further research and advancements in the field can lead to the refinement and wider adoption of this technology, revolutionizing attendance management practices in various industries.

VIII. ACKNOWLEDGEMENT

IX. FUTURE SCOPE

Currently, the world is moving towards eco- friendly and ease to use every product power efficiently. So, to followup this trend this system uses the detection sensor to turn on onlywhen the person comes near to the device. This will save some power source. This system can will be improved more with image processing system i.e. Two factor Authentication and this can be integrated with the smart classroom systems.

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