High end Access Control Systems

Technology Bucket : Security & Surveillance Hardware

Category:

Company Name: Aurobindo Pharma

Problem Code : SK7
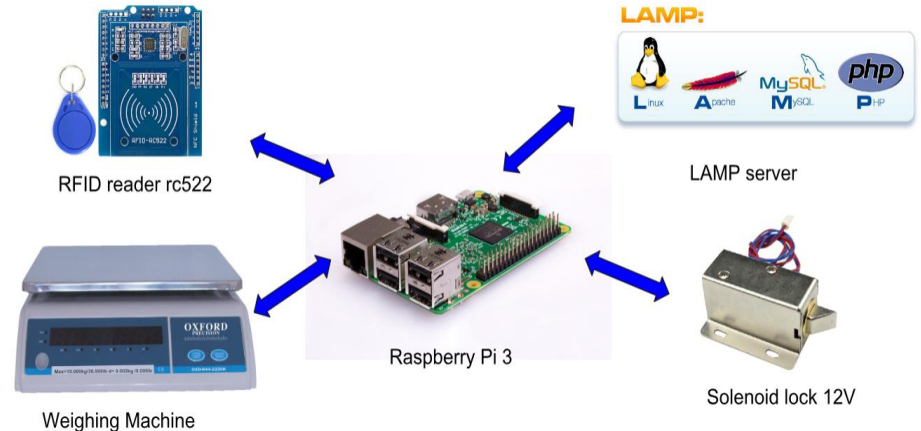
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Problem statement - Full proof Employee Access control systems to ensure that there is no tail-gating of unauthorized personnel.

Idea / Prototype

Sr. No.	Item	Price(₹)
1.	Raspberry Pi 3	3000
2.	RFID reader 125khz	170
3.	Weighing Machine with RS232 port (capacity = 100kg)	8500
4.	125khz RFID cards	20
5.	5V door lock/ solenoid lock	450
6.	Power supply (SMPS)	545
7.	12V to 5V converter	150
Total		**12835**

Proposed solution -

A simple RFID access control mechanism added with the ability to cross verify user's weight and height from the pre-inserted weight and height of personnel in the database and only grant access if the height and weight is correct with the pre decided weight and height thresholds. This will prohibit entry of unauthorized personnel with one more level of security and identity verification.

RFID reader rc522

LAMP server

Weighing Machine

Raspberry Pi 3

Solenoid lock 12V
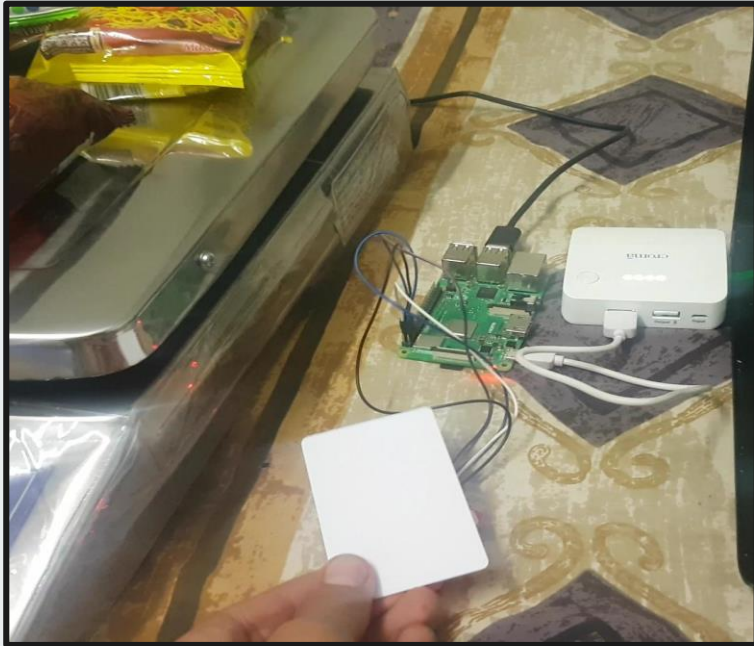
Technology stack

Levels of security -

1. RFID card
2. Password protection
3. Weight verification + threshold
4. Height

Further levels of security can be added according to industry requirement -

- Biometrics (A replacement for password protection)
- Face recognition
- Measurement of step length by piezo-sensors (motion tracking)

- The solution can be achieved by integrating a weighing machine with the **Raspberry Pi** to take weight input of user at the entry gate.
- The code will be written using **Python** and **Tkinter** will be used for GUI development.
- The raspberry pi will be connected to an online database(**LAMP server**) with details of the authorized personnel.
- Raspberry pi will be integrated with **RFID reader** to check the details from the database about the user trying to access the area.
- The **SMPS** will be used to supply power to all electronic parts, the raspberry pi and solenoid lock.

Use cases

The system can be used to ensure security at the restricted sections of a company, manufacturing plant or research institute. The current systems installed at these sites can easy be tempered by duplicating the RFID card or password leak. To make the section more secure we add one more level of security i.e. weight. The weight of authorized employees will be updated in the database on a regular basis. On every access the details of the person will be emailed to a pre-informed email to keep record of the people accessing and the time of access.

Click on this icon to open UML diagram (   )

Dependencies

1. Numpy - the fundamental package for scientific computing with Python.
2. Serial - python library for serial communication for the RS232 port of weighing machine.
3. Tkinter - library to make GUI for user access.
4. RPi GPIO - library to control general input output pins of Raspberry pi.
5. PN532 - library for the Adafruit PN532 NFC/RFID breakout boards.
6. Employee details data for the access control.