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Secured door lock

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Abstract: This abstract briefs about a development of inexpensive system called safety door lock which is designed to assist owner in knowing whether the person who entered has the permission to enter into or not. Also the system will let to know the owner if the door is opened. Based on this the owner can decide what action to take. Proposed project is implement able for finding the unauthorized entry of unknown person. Advantages of such system include extensibility and low maintenance. The idea was to develop a security system for home or industry. The security system will be designed in such a way that if anyone tries to open the door without permission that sensor will send the data to the owner on internet. The idea being if someone tries to enter the secured system door the sensor will read the entry and same information will be sent to the registered owner .The information will be sent over the internet to the owner. And the owner can control the door by sending the command over internet. In the past few decades, an unprecedented demand for wireless technologies has been seen. Mobiles and laptops are becoming part of everyday life of a growing number of devices that communicate wirelessly. Internet of things is becoming more popular everyday and it is being preferred due to its inherent advantages like security, effective communication.

Keywords: Magnetic reed sensor, IOT, Door, Arduino Uno

I.INTRODUCTION

Internet of Things represents a general concept for the ability of network devices which sense and collects data from the world around us, and then share that data across the Internet where it can be processed and utilized for various interesting purposes. The intermediate which we are using for sensing data and sending it to internet is Arduino board with arduino wifi module.

The reed switch contains a pair (or more) of magnetically, flexible, metal reeds whose end portions are separated by a small gap when the switch is open. The reeds are hermetically sealed in opposite ends of a tubular glass envelope. The sensor will sense the data and will send it to the owner's mobile application as its already programmed using arduino board. The program will be written on Arduino in such a way that it will take input from magnetic reed switch and same data will be sent to the mobile application.

The idea is to develop a security system that can prevent the unauthorized entry of unknown persons through a mobile application. The idea being owner can control the opening and closing of door by sending commands over internet. Mobiles and laptops are becoming part of everyday life of a growing number of devices that communicate wirelessly. Because of this reason we are using IOT for our proposed project.

II.MOTIVATION

Cell phone has became a part of our everyday life. And internet of things is becoming more popular everyday and it is being preferred due to its inherent advantages like ease of access, security, effective short distance communication. So we are using this technology in our project.

Suppose you are running a laboratory which is to be maintained cleanly with high precautions. In such laboratory you have to take care of those people who are entering. If some unknown person tries to enter in that laboratory without any precautions. And if he enters into that laboratory the systems may get spoiled. And hence the setup you had in that laboratory may need to be reinstalled again. Which is time consuming and also will cost much to setup? And you may not get the required results or there may be difference in results. So to prevent unknown person's entry we developed this security system. Which enables the registered owner to control the doors through internet? The system will send the information whenever the door opens. So the owner can decide the entry of the person. He can take decision according to him. If he finds that the person is unauthorized he can send the message to the police.

III.PROBLEM DEFINITION

"Development of security door locking system to prevent the entry of unauthorized people."

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IV.APPLICATIONS

Some applications of Security door system are:

1. Home security
2. Industry doors
3. Bank lockers
4. Laboratory doors

V. MAGNETIC REED SENSOR

A switch is like a connecting bridge in an electric circuit. When the switch is closed, the connection is down and electric current can flow around the circuit; when the switch opens, the connection is up and no current flows. So the purpose of a switch is to activate or deactivate a circuit at a time of our choosing.
How does a reed switch works?
In two modes a reed switch will operate. They are,

1. Normally open

In a reed switch, the two contacts (which look like metal reeds) are made from magnetic material and housed inside a thin glass envelope. One of the contacts is a magnetic north pole, while the other is a south pole. As you bring a magnet up to the switch, it affects the contacts in opposite ways, attracting one and repelling the other, so they spring together and current flows through them. A reed switch like this is normally open**,** unless a magnet is positioned right next to it, when it switches on.

2. Normally close

We can also get reed switches that work the opposite way. The two contacts are normally snapped together**.** When you bring a magnet up to the switch, the lower contact is attracted to the magnet; the upper one is repelled, so the contacts split apart, opening the switch and breaking the circuit. Reed switches like this are called normally closed (normally switched on), and they switch off when you bring a magnet up to them.

VI.PRELIMINARY DESIGN AND DETAILED DESIGN

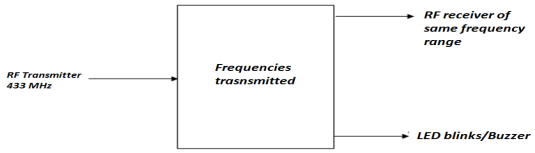

Figure 1: Preliminary Design

We use the basic concept of attraction property of magnetic material. Using this system when the door is opened the circuit is complete and the signal is transmitted and notified to the owner.

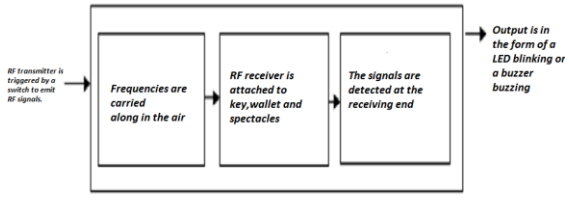

Figure 2: Detailed Design

Initially, when the door is closed the reed switch is open as one of its needles are attracted to the magnet attached to the door and the circuit is open. As soon as the door is opened the needle comes back to its original state and completes the circuit and gives a high signal to the input of the arduino,which in turn runs the motor attached to small gears attached to hinges, and on the other hand a notification is sent to the owner if the

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person is unauthorised to open the door the owner takes an action,which is received by the arduino and the motor is driven and the door is closed.

VII.COMPONENTS REQUIRED

- Door
- Magnetic reed sensor
- Arduino board
- Arduino Wi-Fi module
- Cell phone

VIII. BASIC METHODOLOGY

We use force sensitive resistor to calculate how much pressure or force is applied by the person. Force sensitive sensor will be placed right under the feet inside shoe pads. When user wears this shoe his weight will be acting as a force on force sensitive resistor. Force sensitive resistor consists of conductive polymer which changes its resistance as per force applied on it. Applying a force to the surface of the sensing film causes particles to touch the conducting electrodes, changing the resistance of the film.

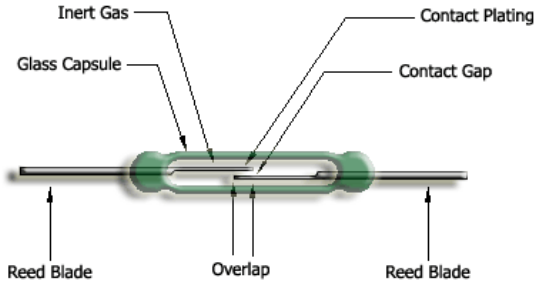

Figure 3: Magnetic reed sensor

We also use aarduino board which acts as a serial communication for our project. Arduino board will receive continuous inputs as sensed by FSR sensor.The Uno is a micro controller board based on ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the micro controller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

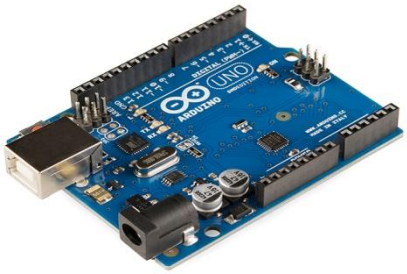

Figure 4: Arduino board

This is another important component of our project. This will help us to connect our arduino board to Wi-Fi network. The ESP8266 Wi-Fi Module is having integrated TCP/IP protocol stack that can give any micro controller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware. The ESP8266 module is an extremely cost effective board.

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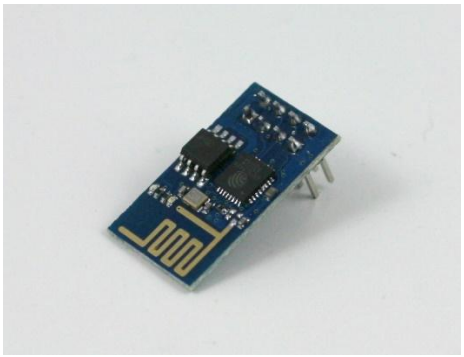

Figure 5: Arduino Wi-Fi module

IX. DESIGN ALTERNATIVES

1) Another way of building a device to perform the same objective along with person's weight. Also we can show how many steps he has taken to reach the distance. Along with that we can even display maximum speed and minimum speed while the user is running.

2) Another aspect is we can keep a GPS module inside the shoes. This will keep track of user.

X.SELECTION OF THE APPROPRIATE APPROACH:

1) Why arduino over raspberry pi?
Another way of building a device to perform the same objective would be using raspberry pi over arduino. We have to interface FSR sensor with raspberry pi. Even though raspberry pi provides more features than Arduino, cost of raspberry pi is comparatively high. So we had drop raspberry pi. And finally we choose arduino.

XI.BREADBOARD IMPLEMENTATION

We first implemented the RF circuit, both transmitter and receiver, on a breadboard as shown in the figure below and got the output.

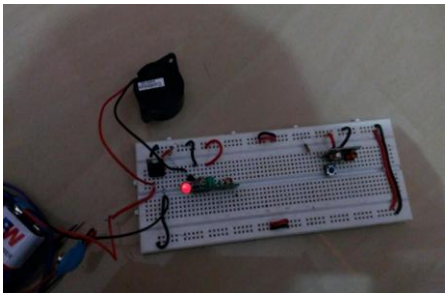

Figure 6: Breadboard implementation

XII.CONCLUSION:

By this concept we can maintain the privacy places want only a certain people to enter.

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