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Arduino Based Home Security System

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ABSTRACT
Security has becoming an important issue everywhere. Home security is becoming necessary nowadays as the possibilities of intrusion are increasing day by day. In this paper, home security system has been designed that has a special feature and which make a dial with the owner of the house to inform him that his house has been hacked. Arduino card was used, which is considered one of modern programmable device and utilize from speed dial function in mobile phone.

Keywords
Arduino, Security System, home security.

Introduction

Over the years, various control systems have been designed to prevent access to unauthorized user. The main reason for providing locks for our buildings (home, office, church, school, etc) is for security of our lives and property. It is therefore important to have a stress free and convenient means of achieving this purpose [1]. In order to save the belongings most of the people employed watch dogs and security personals. They both did well for some time. But both of them can be easily deceived. If properly planned, the burglars could easily deceive a watch man and could even kill him. A single watch man can't fight against 4 or 5 burglars. Even the watch dogs could be made unconscious with the help of chloroform. These failures paved way for the home security systems, which promised a perfect protection of the assets and life.

So many security systems are employed to protect ourselves from burglary and robberies. Now-a-days most of the supermarkets, banks and industries make use of the security facilities to protect them against the burglars.

Industry and banks are the places targeted by most of the burglars. To safeguard these places, surveillance cameras associated with burglar alarms are employed. Using the camera, we can watch each and every person who enters and leaves the place by just monitoring on a television from another room. It helps the cops to identify the burglar and apprehend him soon. The burglar alarms are useful in catching the burglars red handed at the moment of burglary. The moment the burglar breaks into the place, the alarm sounds and everyone will be alerted [2].

Existing Systems

Some of the existing systems are:

A. Video-Registrar: This product allows saving images from webcam or other video capture device, starting on motion detection or constantly with given time interval. Possible to save the defined amount of shots after motion has been detected. The built-in viewer allows viewing cam shots in manual mode and conduct searching mode with given speed. The first system i.e. Video Registrar just captures images when it detects any motion of objects. It is not possible to view the changes online. It can store the data which is possible to be retrieved only after you get back home and see it. It can be thought of like an „answering machine“ on telephone.

B. Net Video Spy Video-surveillance system that allow to monitor remote locations using local network or Internet. This system is an online system which shows surveillance on line. It is somewhat similar to Online Home Security System from the point of view of surveillance but it is dissimilar from the point of view of controlling the system. OHSS provides controlling online.

C. CSSS Video CSSS is Computer Software Security System. After motion detection, program do many operation (play sound file (siren), record sound, video or cam shot, call by telephone, by Skype, send emails). This system i.e. CSSS video does the work of monitoring but control measures provided are to inform the user via emails or telephone calls. It does not enable user to control online.

D. Security Alarm System It Shows line alarm. It provides higher alarm sound. This system i.e. alarm system just rings an alarm for the part of security such as in case of fire. It does not provide monitoring. As stated above, existing systems provide only surveillance as a part of security. Online Home Security System not only provides surveillance through web cam but also provides controlling of devices. The remote PC, mobile or computer is connected to the home PC, which is our server, through modem. And the server is connected to the custom built circuitry. All the home appliances are connected to the circuitry. Through this circuitry, the appliances get operated. The monitoring of the home will also do from remote places without physical presence of the person [3].

Proposed System

Block diagram of proposed system (see Figure 1).

Procedure of work:

1-The owner switches the device on before he left your home.

2-When the thief open the door, magnetic sensor (which set in the main home door) pins will connected, Arduino in turn will connect the relay coil which in turn connects the pins of the number (which specified to call the owner) to inform him that his house has been hacked.

3- If the first call failed, Arduino will be redial after few second.

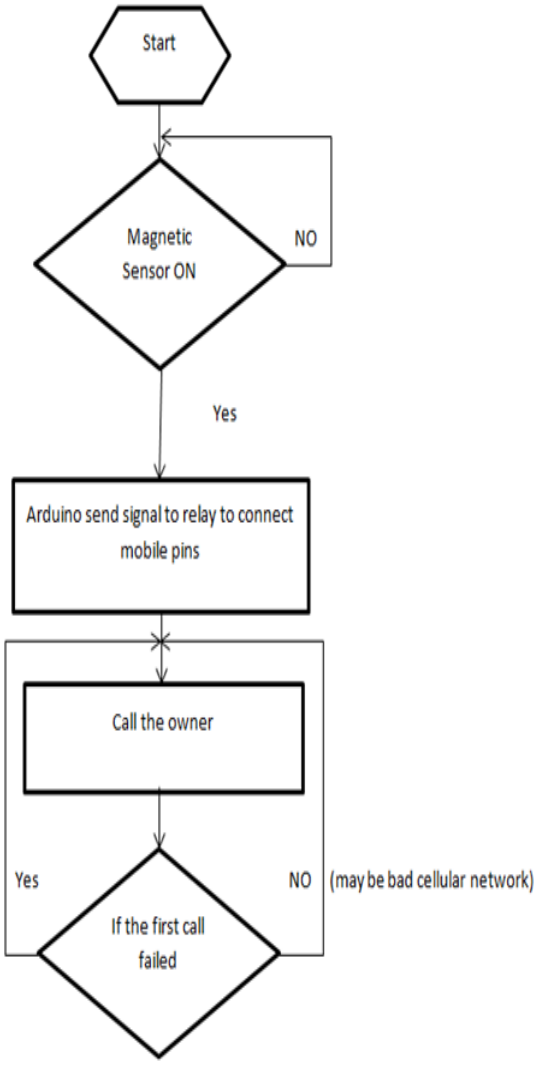

Fig 1: Block Diagram of the Proposed System

The proposed circuit has been connected (see Figure 2).

Fig 2: Connect Proposed Circuit

Arduino Unit:

Arduino is a tool for making computers that can sense and control more of the physical world than your desktop computer. It's an open-source physical computing platform based on a simple microcontroller board, and a development environment for writing software for the board. Arduino projects can be stand-alone, or they can be communicate with software running on your computer (e.g. LabVIEW, Flash, Processing, MaxMSP.) [4]. Outline of the Arduino board (see Figure 3).

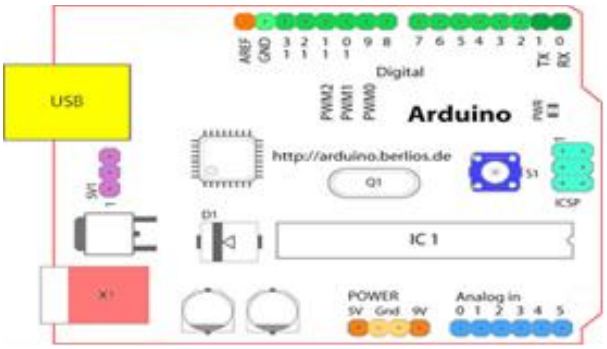

Fig 3: Outline of the Arduino Board

Relay:

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations. Figure.4 shows the internal shape of the Relay [5].

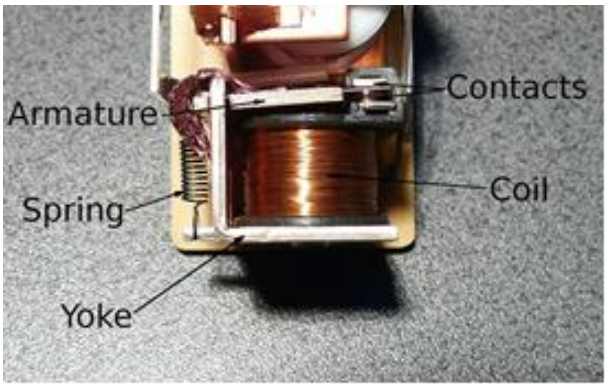

Fig 4: Internal Shape of the Relay

A type of relay that can handle the high power required to directly control an electric motor or other loads is called a contactor. Solid-state relays control power circuits with no moving parts, instead using a semiconductor device to perform switching. Relays with calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults; in modern electric power systems these functions are performed by digital instruments still called "protective relays" [5].

Magnetic Sensor:

Magnetic Sensor used to detect whether a door is open or closed. This sensor offers a low-cost method to monitor access doors or cabinets that should remain closed. The noncontact

magnetic switch mounts to the door of a server rack or equipment room and connects to a Goose climate monitor. Remotely check the door status through the web interface or use alarms to notify you if a door is open. The sensor consists of two main parts, a magnet and a switch with terminals to connect the signal wires. The magnet mounts to a door or access panel, while the switch mounts to the frame. When the door is closed the two pieces should be within 1/2" of each other. When the door opens this distance increases, eventually toggling the switch. This allows the Goose to know when the door is open [6]. Figure 5 shows two types of magnetic sensor with exterior appearance after installation.

Fig 5: Magnetic Sensor Types

Conclusion:

Theft tricks have becoming now possible to control it, which different depending on the location and type of things. Modern devices entered in all areas, became easy to narrow the opportunities for robber in several different ways without cost of considerable material. Arduino has been used for design a security and reliability system for the home. Mobile phone has been based in proposed system to utilize the dialing with the owner (Under any circumstances and in any place) to inform him that his house has been hacked. If the first call failed, the proposed system will recall after 30 seconds (Can be changed as desired by the owner of the house).

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