Introduction

With the advanced development of internet computing, various systems can be easily accessed and remotely controlled through mobile devices. In this era self-build make it possible to solve the current security lock system has three main problems which are insecure, unawareness of break-ins and inconvenience by ourselves by using home automation technologies. Conventional lock is easy to lock picking and leaves home vulnerable to break-ins. Second, the home owners are often unaware their homes are being break-in when they are at work or away from home. Lastly, physical keys are bulky and inconvenient to carry. To solve these issues, we have developed an inexpensive smart home security lock system using fingerprint matching as the main access of the door with surveillance camera, a web-based control and notification system.

Objective

Our objective is to build an easy to install and low cost smart home security lock system with the function of fingerprint access and remote lock control through mobile devices. We aim to maximize security and optimize convenience in order to provide a safe and comfortable home security.

Features

1. Fingerprint access
2. Alert the users by email notification attached with image data when fingerprint mismatch is detected
3. Remote lock control through web application
4. History log

Methodology

Overview of the whole system

The systems are consist of three main modules:

Hardware subsystem 1 (Arduino)
- Sub-system connection
- Instructs lock, LCD monitor, keypad and fingerprint sensor

Hardware subsystem 2 (Raspberry Pi)
- Use as a server to communicate between web application and the subsystem 1
- Instructs the camera

Web application

Result

We have successfully built a functional smart lock System
- The system can recognize enrolled fingerprints and lock/unlock the door
- Remote lock/unlock from the web application
- Email notification attached with image data when mismatch fingerprint is detected

Accessing with non-enrolled fingerprint

Email notification

Remote control on door lock via web application

LCD screen showing