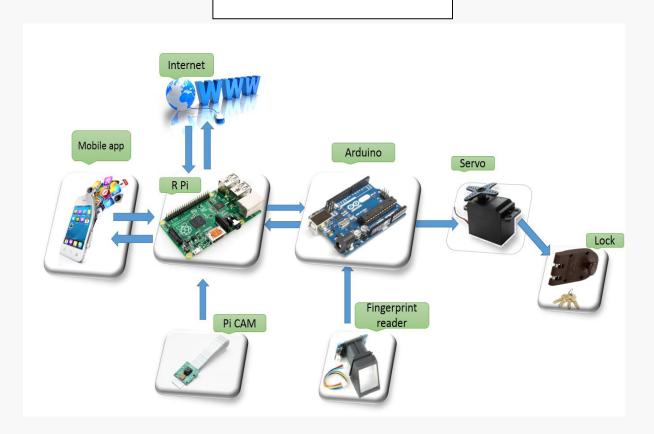# SMART LOCK

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Abstract: **Smart Lock is an internet controlled biometric security lock. It has been specifically developed for Electronics Club IITK main door, to give a hassle free access to club and non-club members. It gives biometric access to club secretaries and coordinators, while non-club members can be given remote access by club coordinators on request. This lock also features live video steaming and data logging, which can accessed over a secured network using an android app or website.**

I: Hardware

- Arduino Uno R2
- Raspberry Pi 2, model B
- R305 Fingerprint reader
- Robokits RKI-1211 Servo
- Godrej Ultra Vertibolt Lock
- IR couple (proximity sensor)
- CLCD screen
- Logitech Webcam
- Wifi module
- Self fabricated shield

II: Softwares

- Arduino IDE
- Python IDE 2.7
- PuTTY
- Windows 8.1
- Raspbian

III: Implementation

Raspberry Pi act as central processing unit. It hosts a webserver using flask framework for python and interact with other peripherals using arduino.Pi uses JSON for data base management and jinja2 for rendering templates on webpages. Arduino controls peripherals like servo, fingerprint reader, proximity sensor and CLCD.Arduino interacts with fingerprint sensor using adafruit library and sends fingerprint ID received from sensor to Raspberry Pi using serial communication.

On start up a python master script runs on Raspberry Pi. It initials webcam and all other scripts. It also performs action like connecting to wifi, hosting webserver and flushing previous records.

IV: Working

After the system has been setup it can be easily controlled using an interactive website and android app. Website homepage features five tags: Web Authentication, Enroll, View Log Data, Search ID and live video streaming.

Web authentication gives one time remote access on enter correct username and password of a registered user. Enroll is used to register fingerprint of new users. Enrollment can be done only by coordinators. View Data Log shows the complete data base of people enter and leaving the club with date and time. Live video steaming tag steams the video from webcam at 10 fps.Proximity sensor checks weather the door is in correct locking position or not. And CLCD screen gives real time messages to users like current lock status and steps while enrolling.

V: References

Book: Getting started with Raspberry Pi, Matt Richardson & Shawn Wallace

http://mattrichardson.com/Raspberry-Pi-Flask/

https://docs.python.org/2/library/json.html

https://www.arduino.cc/en/Guide/HomePage/