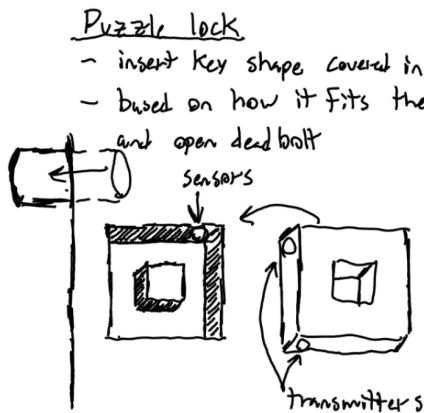


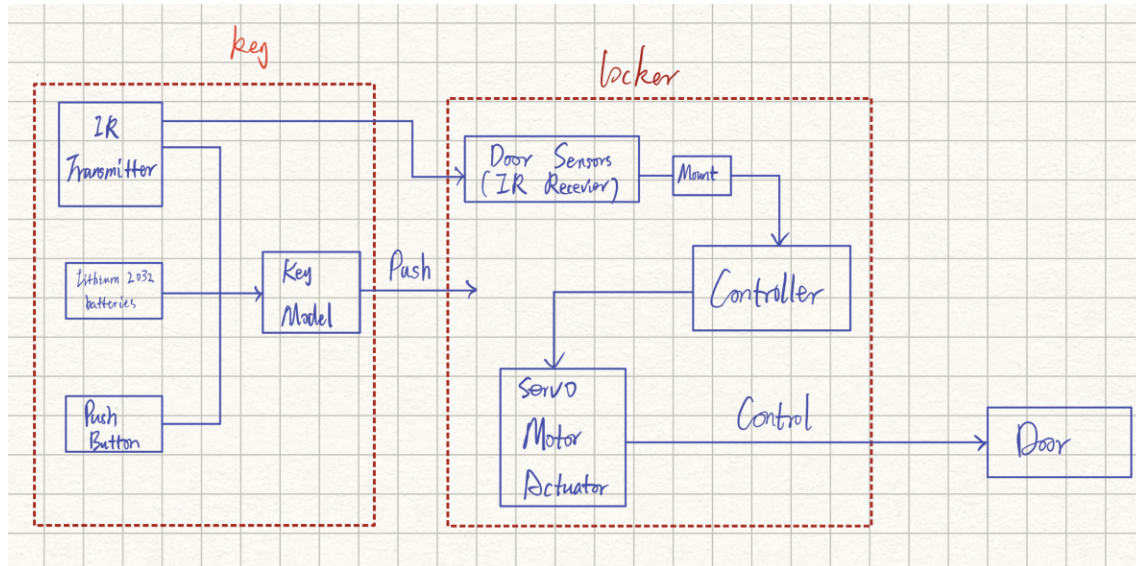
Requirements: (please feel free to modify anything, thank you! :) ---Tianshu Chu)



1. Appearance: The appearance is roughly as shown in the figure. The shape of the key should be highly matched with that of the lock.
2. Material: In order to improve firmness, it should be made of metal.
3. Size: as a door lock, it does not need a very large size, maybe within 15cm x 15cm.
4. Energy: battery should be used as energy (can be a large capacity lithium battery) to improve the practicality and convenience of the lock.
5. Standby time: Keep standby time for at least 6 months.
6. Safety: When the power of the device is low or damaged, there should be a prompt sound to provide security for users. The door lock has two working modes, which can avoid the problem of unusable in the case of failure of one working mode.
7. Controller: Arduino uno R3.
8. Language: C/ C++.

The door lock is the house's defense, and it is of great importance. Replacing traditional door locks with puzzle locks improves security. At the same time, its various unlock functions also bring users interesting experience and security protection.

System Architecture



This is a rough sketch, I will draw it with software tonight.

Project Design Specifications:

The hardware design is fairly simple. There is an interaction between the key and the mount on the door. The key will hold a set number of IR transmitters that will be attached to a battery and a push button. When the key is activated (using the push button) it will send IR signals out from its respective places on the key. When in the mount and aligned correctly the mount will notice inputs from the IR sensors and send 1's or 0's to a controller's I/O ports. When the controller sees the correct inputs being read it will send an output signal to a stepper motor which will cause an actuator to move in or out (based on previous position) and control the deadbolt of a door.

- Sensors: Infrared transmitters/sensors. The finalized part will be included in the bomb, and based on the size and shape of the key we plan to make
- Controller:
- Power: lithium 2032 batteries. They have a good voltage level, and are very small.
- Firmware: We will be using the "C" programming language. It seems to be the most comfortable language that each team member knows
- Integrated Development Environment (IDE):