Web Door Lock

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Introduction

- Locks have always been a way to secure a home
- Lose a key and there's no other convenient way to unlock the door from the outside
- The web door lock is a convenient and easy way to access your door lock from outside
- Visitors and don't want to get up, can easily unlock the door from any smartphone or laptop
- This is our journey on how we built our prototype of this web door lock

Description of Device

- The web door lock is a simple device that anybody can use
- All the instructions on how to connect and operate the device will be included in the user manual
- After connecting to the device, the web server will have a button to either unlock or lock
- After pressing the button the device should either unlock or lock the deadbolt lock with the servo

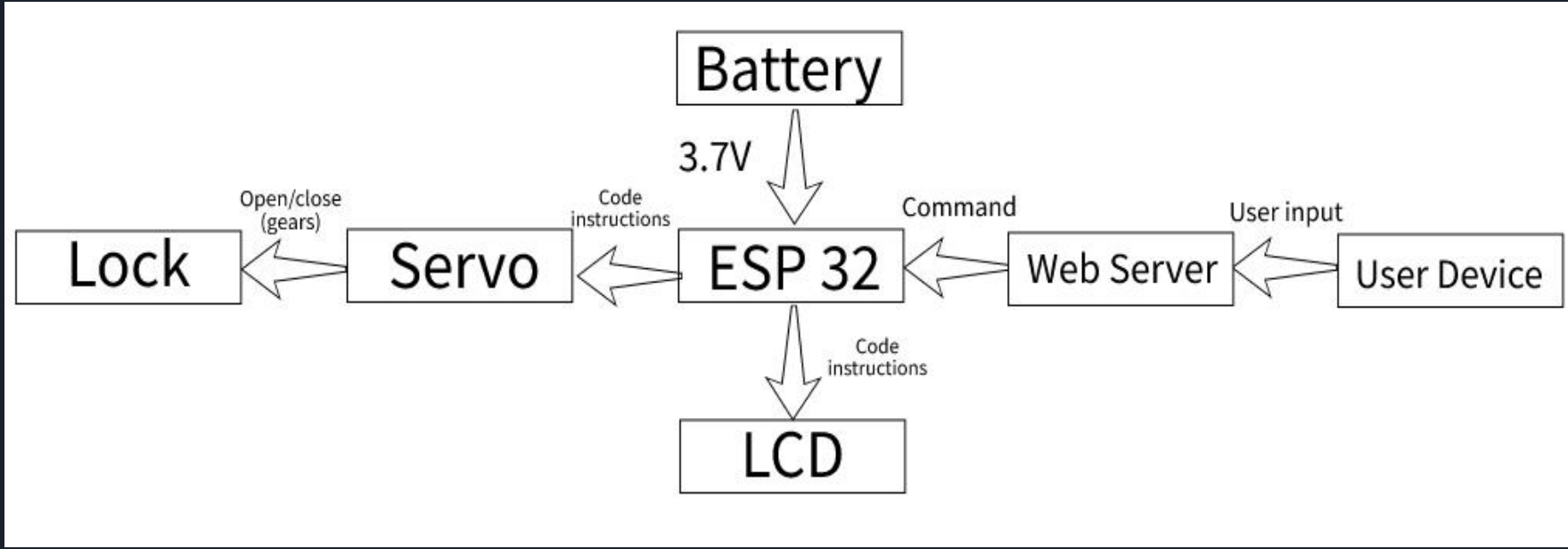
Changes to the Project

- Battery(4.8V Battery pack -> 3.7V LiPo Battery)
- Board(Arduino->ESP32)
- LED to LCD
- Web server UI
- Stronger Servo motor

Technical Description

- ESP32 hosts a web server that the user can access by typing the device's IP address into a web browser
- When user presses the button on the website, the ESP32 changes the angle of Servo motor to spin a gear on the deadbolt and updates the door status on the site
- Uses a 3.7V 10000mAh rechargeable Lipo battery
- MAX17043 fuel gauge - reads relative state of charge of a LiPo battery
- Device reads battery level using fuel gauge to display battery percent on site
- 16x2 LCD display used to display IP to user so they can access the controls for lock

Block Diagram



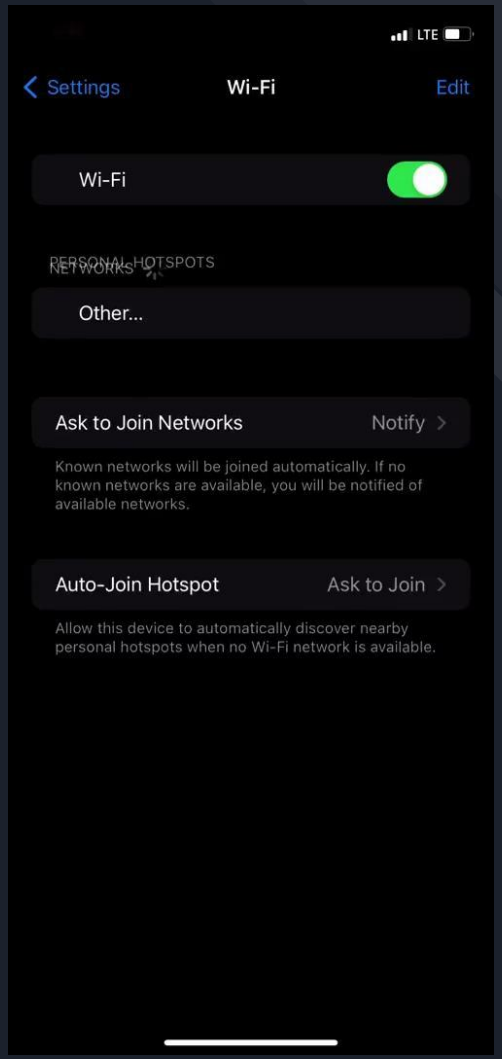
Timeline

- Project started - Week 1
- Website UI designed - Week 4
- Web Server set-up - Week 4
- Website UI implemented - Week 5
- Servo control added - Week 7
- Connecting gears to servo and bolt - Week 10
- Battery level reader added to website - Week 12
- Gears placed and tested - Week 14
- Integration - Week 14

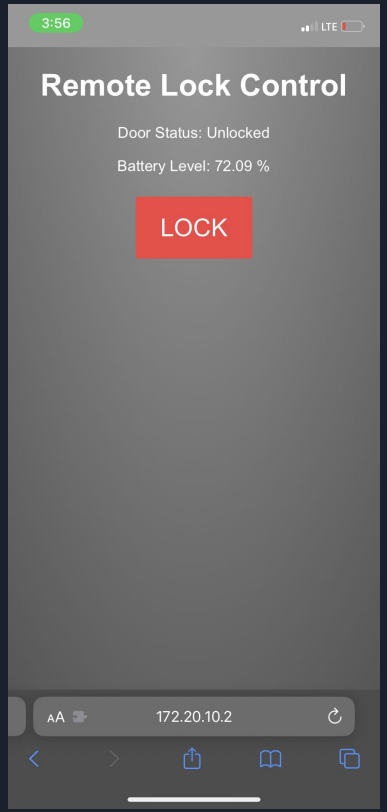
Challenges

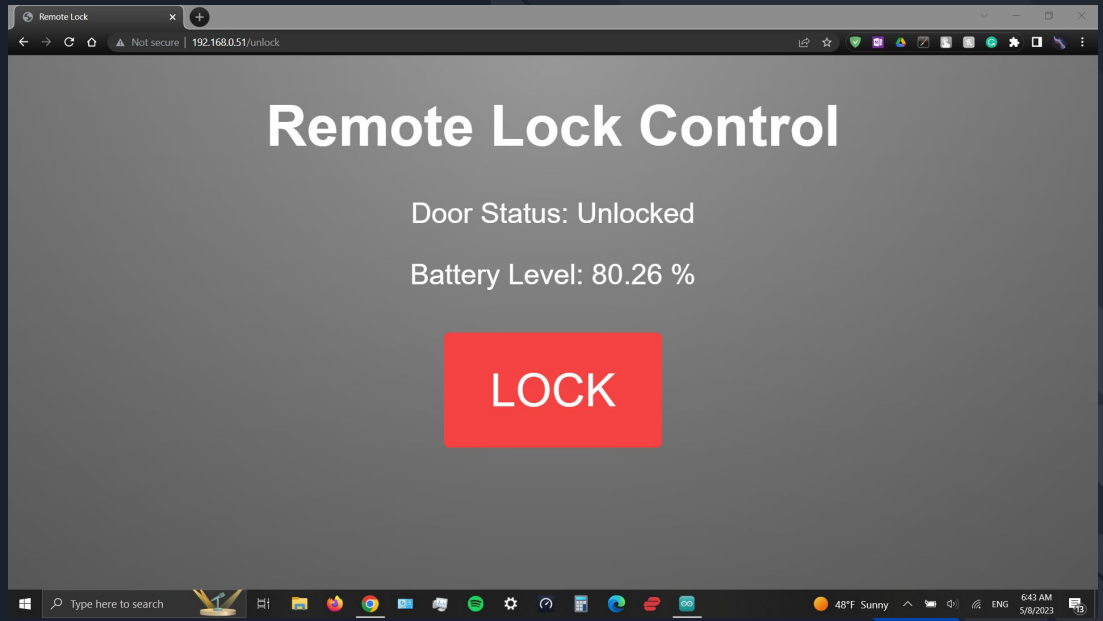
- Placement of all the items into the case
- Having the gears working properly with the servo
- The key unlocking the door from the outside without breaking any gears
- Power constraints

How to connect



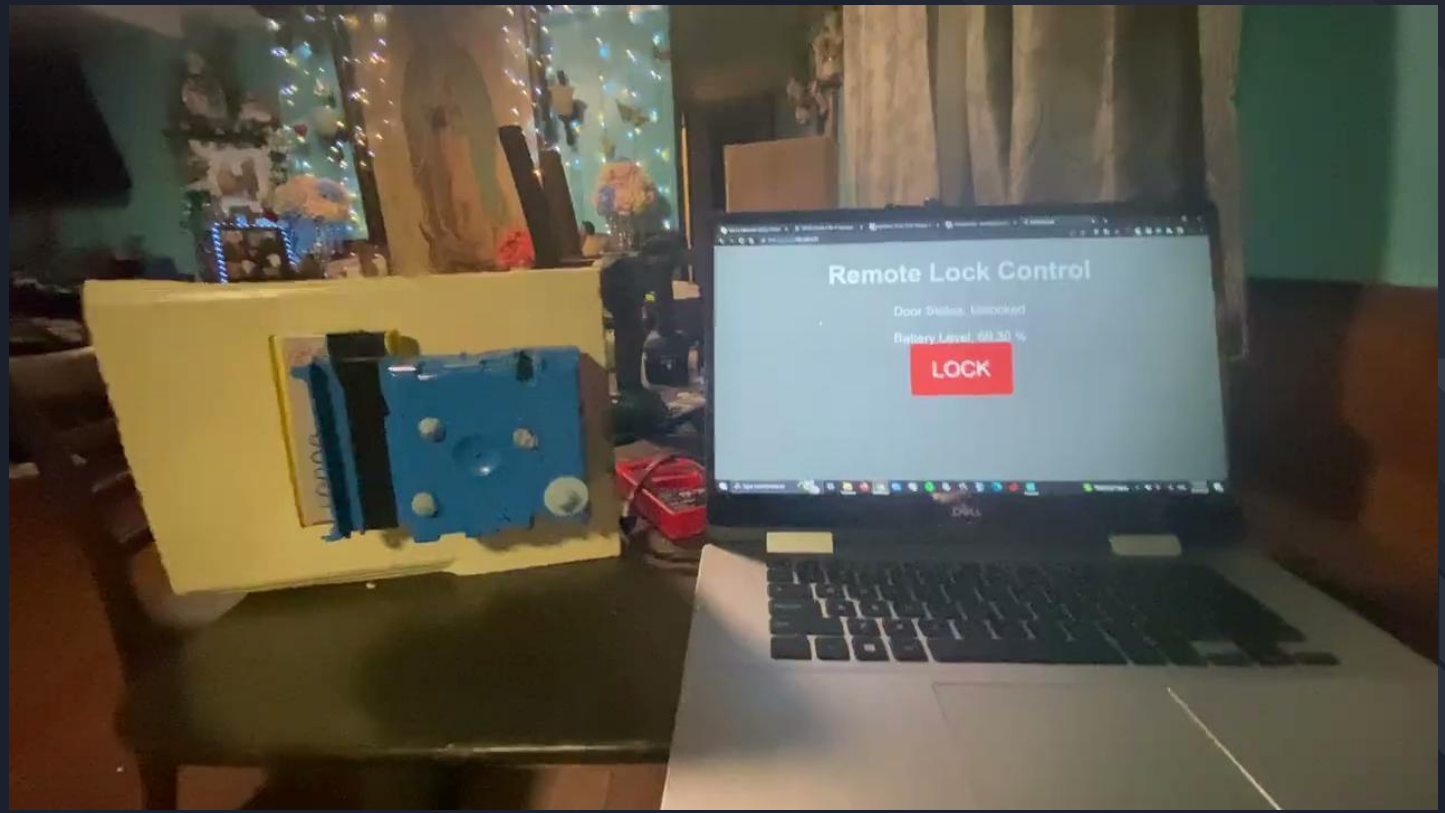
Web server


3:56
LTE
Remote Lock Control
Door Status: Unlocked
Battery Level: 72.09 %
LOCK
AA
172.20.10.2

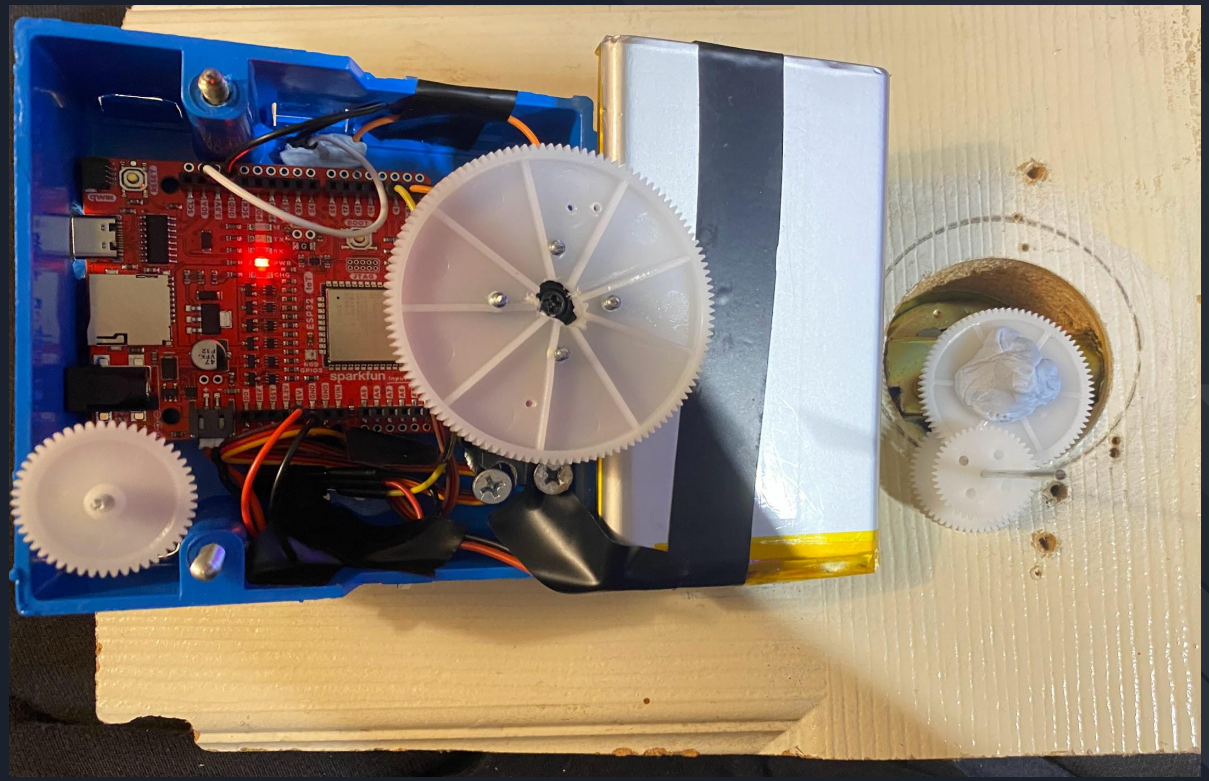

Remote Lock
Not secure | 192.168.0.51/unlock
Remote Lock Control
Door Status: Unlocked
Battery Level: 80.26 %
LOCK
Type here to search
48°F Sunny
ENG
6:43 AM
5/8/2023

Project Demonstration

Project Demo



Internals



Potential Improvements

- Improve the look of the outer shell
- Door compatibility
- Improve the battery life of the device

Q&A