

Project Proposal

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Section A – Scott

Timed Lock Box

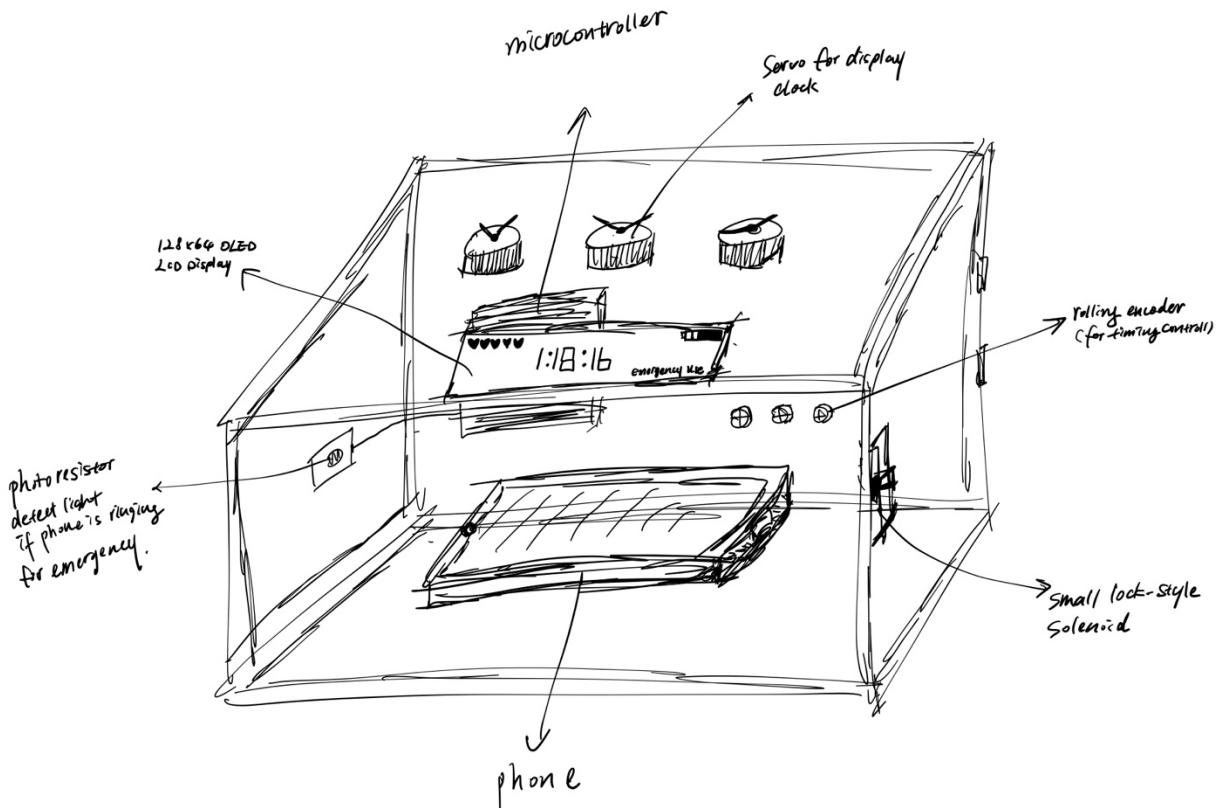


Figure 1. Low-fi prototyping for the timed Lock Box containing all the components to make up the functional self-control lock box.

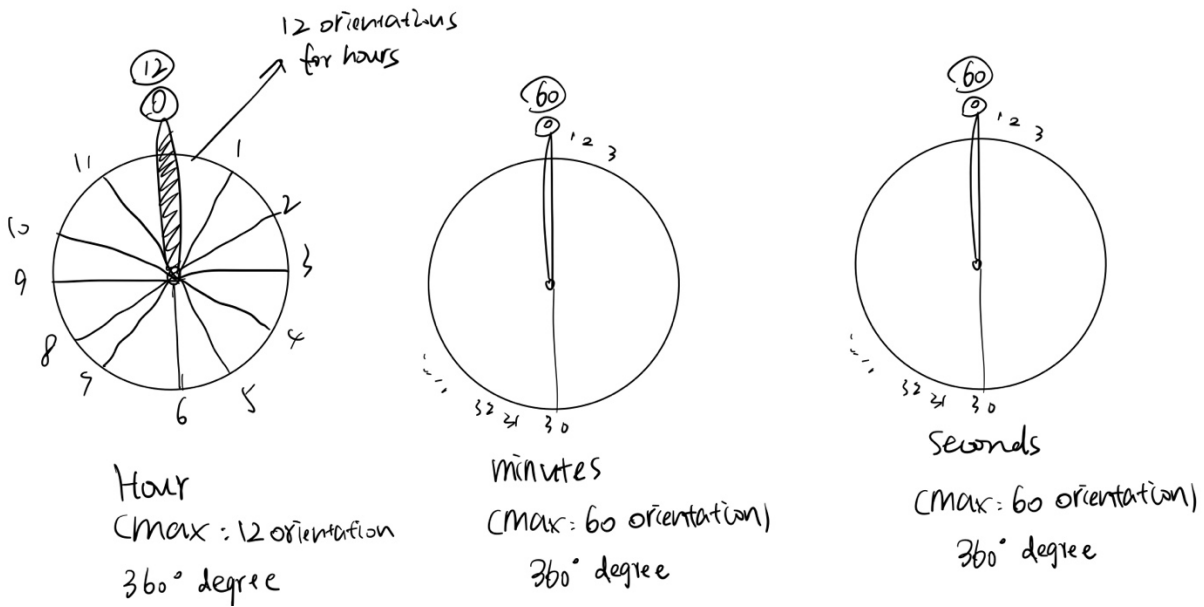


Figure 2. Instruction of servos working to indicate hours, minutes, and seconds.

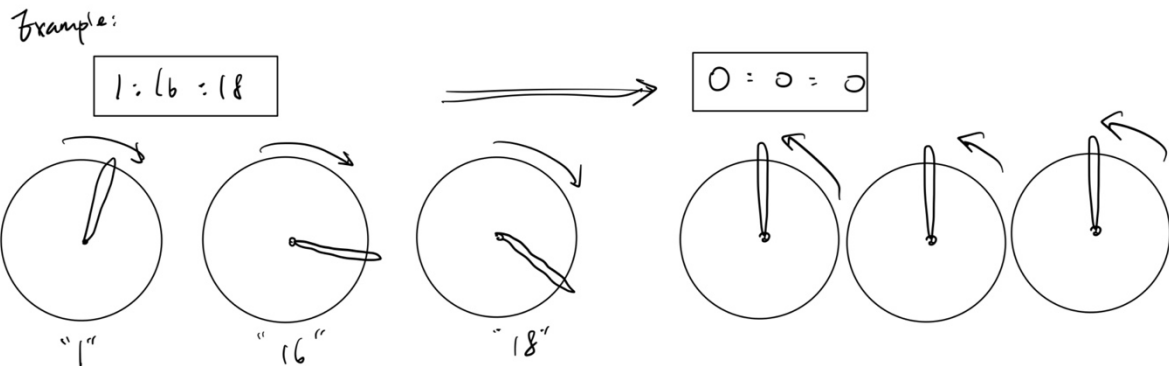


Figure 3. Example of actual servos will be worked as countdown from 1:16:18 to 0:0:0.

Components:

1. Small lock-style solenoid
2. 3 rolling encoders
3. Photoresistor
4. Vibration switch sensor module (stretch goal for potential extra feature to detect if the phone is vibrated to unlock the box)
5. 360-degree rotation of 3 servos
6. 128 x 64 OLED LCD display module
7. Wooden Box
8. Arduino microcontroller

Basic Functionality:

1. When the phone is ringing/lighting due to phone call, LCD display shows “Phone is lighting, box is unlocked”, the solenoid will be unlocked.
2. 3 buttons rolling encoder to control time setting, display on LCD and meanwhile servos are rotating to correct places (See figure 2 for instruction of servos).
3. After the “seconds” which is the third rolling encoder has been set, 3 seconds later, the box can be auto locked without extra “lock” button.
4. In the state of count downing, user can use encoder to select “emergency use” feature by the third rolling encoder and wait 3 seconds (waiting 3 seconds for auto lock/unlock). and the “heart” amount on LCD will be reduced.
5. LCD display can show battery level based on current 9v battery.

Stretch Functionality:

1. Detecting if the phone is vibrated from vibration (within certain range so that it won't detect as vibrated by outside resource) module and unlock the box without using “emergency use” chances.

Links:

Servos: https://www.amazon.com/Wishiot-Continuous-Rotation-Microbit-Helicopter/dp/B0BZH7JK4N/ref=asc_df_B0BZH7JK4N/?tag=hyprod-20&linkCode=df0&hvadid=693677015411&hvpos=&hvnetw=g&hvrnd=9673860393618916838&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmld=&hvlocint=&hvlocphy=9010796&hvtargid=pla-2227359524394&psc=1&mcid=a3b8b67f43bf335dac2dbe3700189ab9

OLED Display: https://www.amazon.com/UCTRONICS-SSD1306-Self-Luminous-Display-Raspberry/dp/B072Q2X2LL/ref=asc_df_B072Q2X2LL/?tag=hyprod-20&linkCode=df0&hvadid=693404282528&hvpos=&hvnetw=g&hvrnd=10107585401443987272&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmld=&hvlocint=&hvlocphy=9010796&hvtargid=pla-880351471607&psc=1&mcid=7a54e796ba8b37ba8e95a5222cfbcfc5

Rolling Encoder: <https://www.adafruit.com/product/377>

Displaying battery life on LCD: <https://www.instructables.com/Displaying-Battery-Life-on-a-Liquid-Crystal-Displa/>

Make servo rotate 360 degree: <https://www.youtube.com/watch?v=JhHSXCLsN4k>