**ECE 153b Project Proposal**

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Website: https://sites.google.com/view/vault-door-system/

***Overview***

Using a RFID chip reader, a bluetooth chip, and a small motor, we aim to create a key-card vault door system. The RFID chip will read a valid card, prompting the user if they would like to unlock the door (via bluetooth). We will implement a timeout using the RTC that will only allow a user to unlock the door within a specified time frame (to increase security). Upon receiving the prompt, if the user responds to allow door access, the motor will turn and open the door. When the door is opened, a timestamp will be logged of when it was opened and for how long. Once the door is open, the user will have the ability to command the microcontroller through bluetooth to close the door.

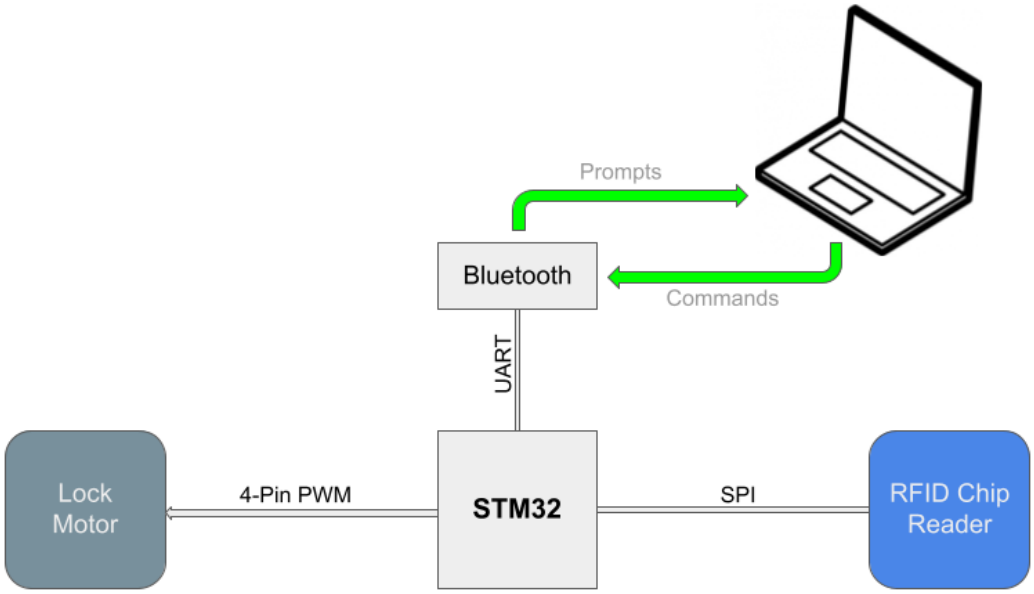
***Peripherals***

- HC-05 Bluetooth Module
- RC522 RFID Module
- SG90 Micro Servo Motor

***Serial Interface Protocols***

- UART
- SPI

***Block Diagram***




***Responsibilities***

We both plan to work together on the entire project, however we will each lead these efforts:

**Jake Greenbaum**

- RFID Chip Reader ~ validation and interrupt signal generation

**Nick Pellegrin**

- Bluetooth Communication
- Lock Motor Control

***Manual/Reference Guide Links***

- STM32 Reference Manual: https://gauchospace.ucsb.edu/courses/pluginfile.php/10412783/mod_resource/content/9/STM32L476VGT6%20Reference%20manual.pdf
- RFID Chip Reader Data Sheet: https://www.nxp.com/docs/en/data-sheet/MFRC522.pdf
- Bluetooth Module Data Sheet: https://components101.com/sites/default/files/component_datasheet/HC-05%20Datasheet.pdf
- Servo Motor Data Sheet: https://robojax.com/learn/arduino/robojax-servo-sg90_datasheet.pdf