Inspired by consistent mailbox robbery on the hill, I set out to create a secure, robber deterrent mailbox. The first iteration incorporated sound as the "spray bottle" to scare away potential package thieves and to encourage those with the correct RFID tag. With a simple servo locking mechanism, it functioned, but fell apart with the enclosure. It was messy, and did not fully close. Too small, and conforming to a typical mailbox style, there was much to improve upon.
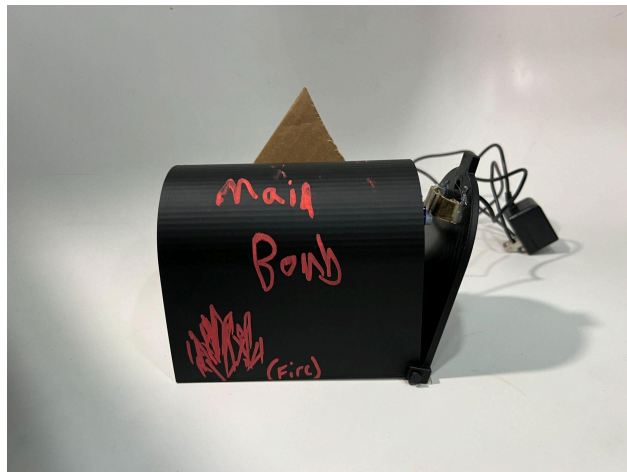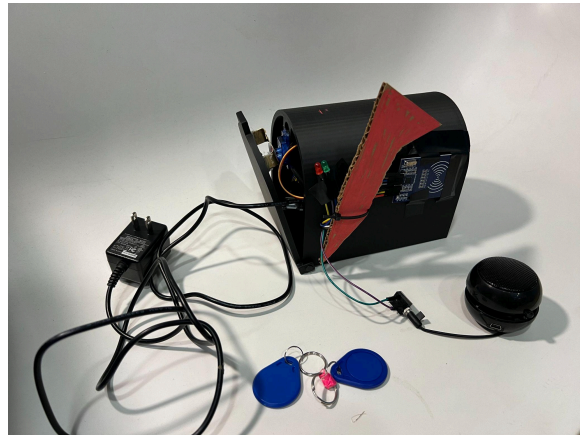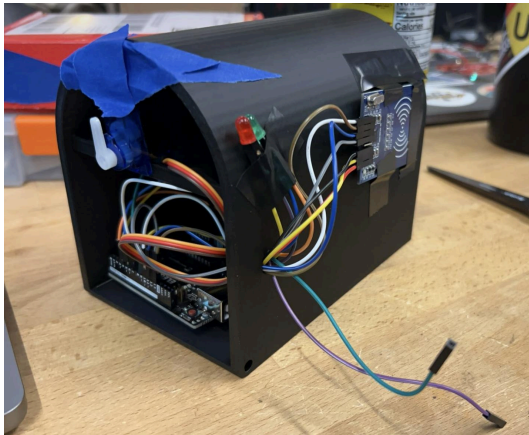
For the second iteration, the focus switched to really hiding the electronics, while also leaving plenty of room for packages and goods. Shifting to more of a safe-style enclosure, functionality and usability became much easier to achieve. The size of the enclosure alone allowed for sliding shelves to hide wiring, as well as leaving plenty of space for packages. Additionally, the second iteration moved away from the silly sound system for a silent, sleek design. Moreover, rather than utilizing an RFID locking system, I incorporated a keypad entry system with a three attempt limit, triggering a one minute lockout if all three attempts are incorrect. Also incorporated was a package detection system using a photoresistor coupled with an in-box light and rolling averages to detect drops in light when a package is placed inside. If the detected light average drops in value, a mailbox flag swings up to indicate there is a package inside. When removed, and the light increases once again, the flag goes back down to indicate the box is empty. Additionally, the locking mechanism was improved to allow the box to fully close, displaying the potential of a more rigid, secure locking mechanism.
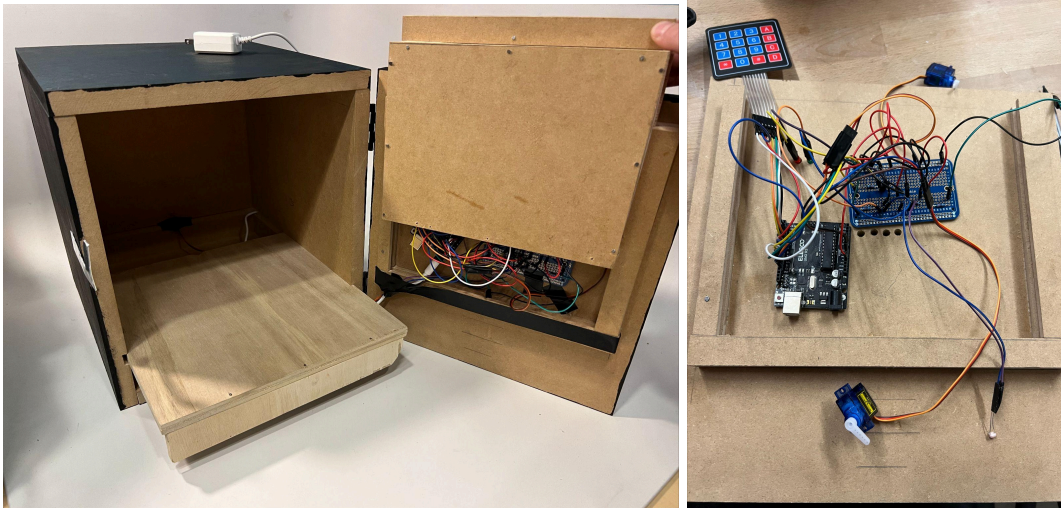
All in all, I am very pleased with this second iteration, feeling as though I accomplished everything I set out to, tackling every issue I noted with the first locking mailbox prototype.

[IDC2 Video](#)

Looking to the future, I would love to nail down the package detection. It functions as intended, however the photoresistor I incorporated is quite finicky, and even with consistent lighting conditions it produces inconsistent values, translating to occasional, unintended flag movement.