Project Title: Security At Your Fingertips

-Embedded Microcontroller Group 25

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For our project, we created a small personal safe that utilizes fingerprint and keypad verification methods. The safe takes advantage of an embedded microcontroller that manages the components in our box to make sure the items are stored safely. The components in our box consist of a fingerprint scanner, a servo, and a LCD screen for extra security. Our project is useful in the consumer’s everyday life since everyone has things they want to keep safe. We have noticed that in this growing digital world we live in, where nothing is safe, there’s a dire need to keep physical objects safe. Our solution is multiple levels of security. This takes away the ability to crack the code or steal the key to unlocking the box. The only way to unlock the box is through both a code and a fingerprint scanner. It allows for the user to hide their key in plain sight.

After coming up with many ideas, we decided to make a safe that only opens if a correct pin is entered and if it recognized a person’s fingerprint. Since this is only a prototype, we built our safe out of acrylic , but if we were to build one on a bigger budget, we would have built it out of metal. First, we installed our servos into the box and connected them to a metal bar to control the lock/unlock function. Next, we connected the servo to the fingerprint scanner and programed the scanner to activate the servo only if it recognizes the fingerprint. Then, we attached the servo to the box and the box was able to function as a safe.

The process of putting our box together was not very difficult, but it was tedious. Connecting the LCD screen may have been the most time consuming section of our project. The wires took most of our time since there are about 40 wires connecting to the LCD screen alone. Other than taking a little bit of time, the project was brought to life without many setbacks. Our dream was finally made into a reality.

To enhance our safe’s security, the safe could be made out of a more sturdy material such as metal. One other improvement would be implementing a facial-recognition device to serve as a third layer of security for our system. Even without these upgrades, we believe we did the best we could with the time and budget constraint we were given. We learned a lot about this project and seeing it come to life makes all the hard work we put into it worth it. We learned not only how to make a safe, but how to make an efficient team.