Mechanical Overview

Year: 2019   **Semester:** Spring   **Team:** 2   **Project:** Guard DAWG System
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1.0 Commercial Product Packaging

1.1 Product #1: *Nest x Yale Lock (Nest x Yale Lock [1])*

Figure 1: Nest x Yale Lock

Nest x Yale Lock (Figure 1) is one of the similar products on the market right now. The packaging is very simple. It's a small rounded box with a capacitive touch surface. The surface features number pad with numbers [0-9], "ok" and "back" buttons represented by a checkmark and a left-pointing arrow respectively. The positive aspects of the packaging is that it is very simple but sleek. It does not distract user with any extra buttons and/or features. Though, it is also a negative aspect because it does not look like it has a lot to interface with and it begs for extra functionality right of the bat. Our project plan is to have a similar design in terms of having a number pad as an external interface for the user. However, our project also features a camera that captures user's face and runs a facial recognition algorithm in order to determine whether it's a known person to be let in or an intruder.

1.2 Product #2: *Corum Security CS-100 (Corum Security CS-100 [2])*

Figure 2: Corum Security CS-100

The other product on the market that is similar to ours is the Corum Security CS-100 (Figure 2) lock that features a facial recognition camera, capacitive touch screen, and a mechanical override option in a form of a physical key. The packaging has more user interfacing options too. It's more interactive with its touch screen that has an ability to display a number bad or a camera's output. The positive aspect of this product's packaging is that it is very simple and does not distract with extra feature and it has more user interfacing options as opposed to the Product #2 (Nest x Yale Lock). It's packaging also contains all the product's electronics which is

nice when it comes to installing it. On the negative aspect side, the packaging "looks heavy" which might not attract certain types of customers that would go for a more sleek design. The packaging itself is not very similar to our project, but it contains same exact functional components. The camera and physical number pad in our project are separated from the door handle.

3.0 Sources Cited

[1] Nest, "Nest × Yale Lock | Installation and Tech Specs," Nest. [Online]. Available: https://nest.com/lock/nest-yale-lock-key-free-smart-lock/tech-specs/ . [Accessed: 08-Feb-2019].

[2] "Corum Security Face Lock 1.0 Biometric Keyless 4-in-one Facial Recognition Smart Door Lock Knob RFID Passcode with Touch Screen (Now Also Available in Facial Recognition Safe)," Amazon. [Online]. Available: https://www.amazon.com/Corum-Security-Biometric-Recognition-recognition/dp/B075QM94CC . [Accessed: 08-Feb-2019].

[3] "Nest x Yale Lock Image" Nest. [Online]. Available: https://store.nest.com/assets/images/social/open-graph/nest-yale-lock-key-free-smart-lock.jpg. [Accessed: 08-Feb-2019]

[4] "Corum Security CS-100 Image" Corum Security Lock. [Online]. Available: http://www.corumsecure.com/wp-content/uploads/2017/03/Lock_Front_V1_Key_Battery_Face.jpg [Accessed: 08-Feb-2019]

Appendix 1: CAD Model Illustrations
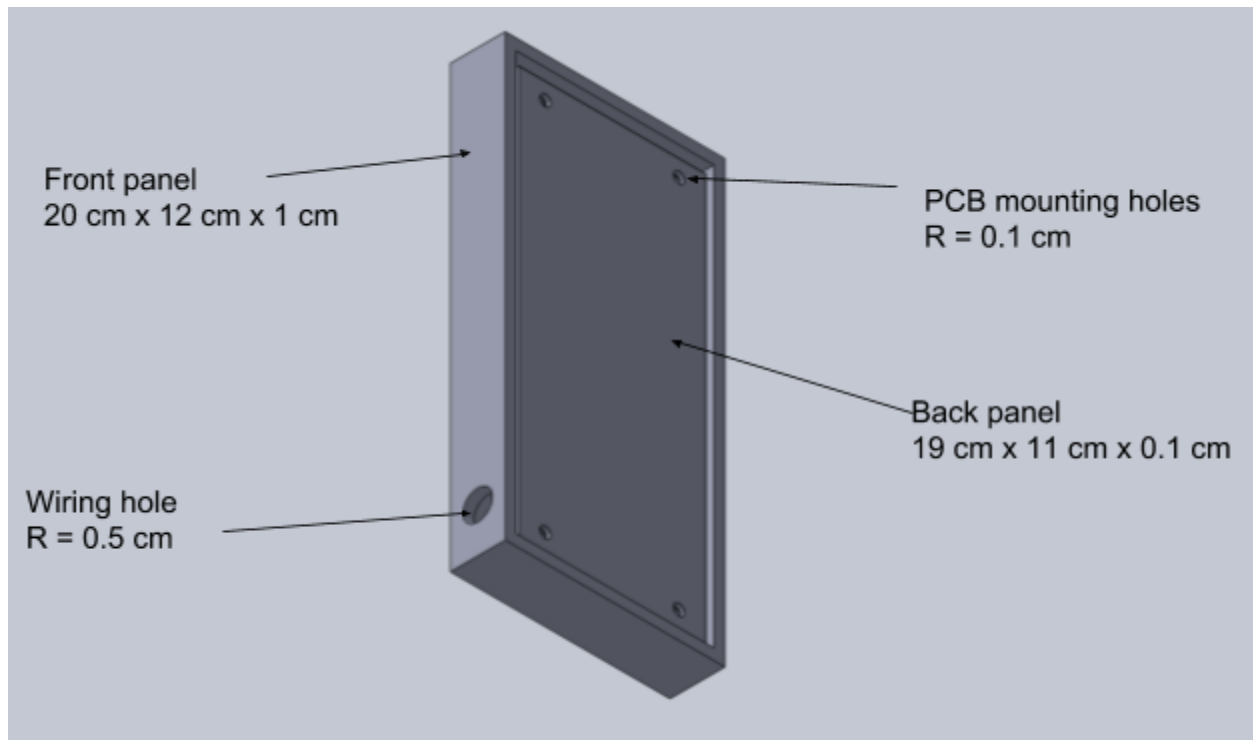
Figure 3: Preliminary Mechanical Housing Model

Appendix 2: Project Packaging Specifications

Material	Quantity	Weight	Cost
Number Pad	1	0.25 lbs	$1
Camera	2	2 oz.	$23.90
Lock	1	20 lbs	--
Box	1	5 lbs.	$10

Tool requirements: Drill, Drimer, Filing Tool, Screwes, Pins, Terminals
Total estimated weight of the package: 30 lbs
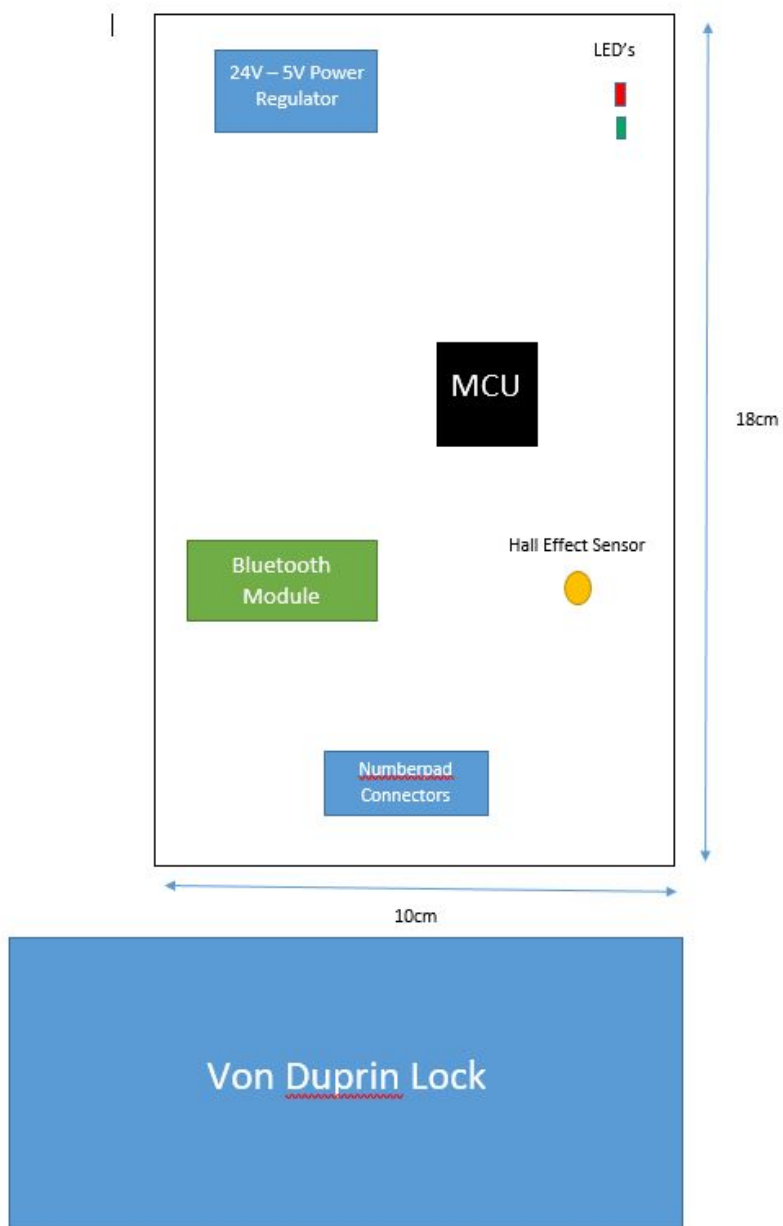Total estimated package cost: $40

Appendix 3: PCB Footprint Layout

Figure 4: Preliminary PCB Layout