



The Package Smart-Lock

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The Problem



- ▶ **58 Million** Americans **victim** to porch pirates
- ▶ **Medium sized** packages **frequently targeted**
- ▶ Current solutions **limited** on **shape** and **size** of package

Existing Attempts to Solve Porch Piracy



Solution 1: Ring Video Doorbell

Pros:

- ▶ Captures video
- ▶ Alerts user
- ▶ Real time communication
- ▶ Deters theft

Cons:

- ▶ Doesn't physically protect packages

Existing Attempts to Solve Porch Piracy



Solution 2: Landport Lockbox

Pros:

- ▶ Durable
- ▶ Secured deliveries/ retrievals

Cons:

- ▶ Package size and shape limited
- ▶ Unable to secure multiple packages

Existing Attempts to Solve Porch Piracy



Solution 3: Amazon Hub Locker

Pros:

- ▶ Location deters thefts
- ▶ Lockers secure packages
- ▶ Self service

Cons:

- ▶ Limits package size
- ▶ No Third-party deliveries
- ▶ Inconvenient for user

Our Solution



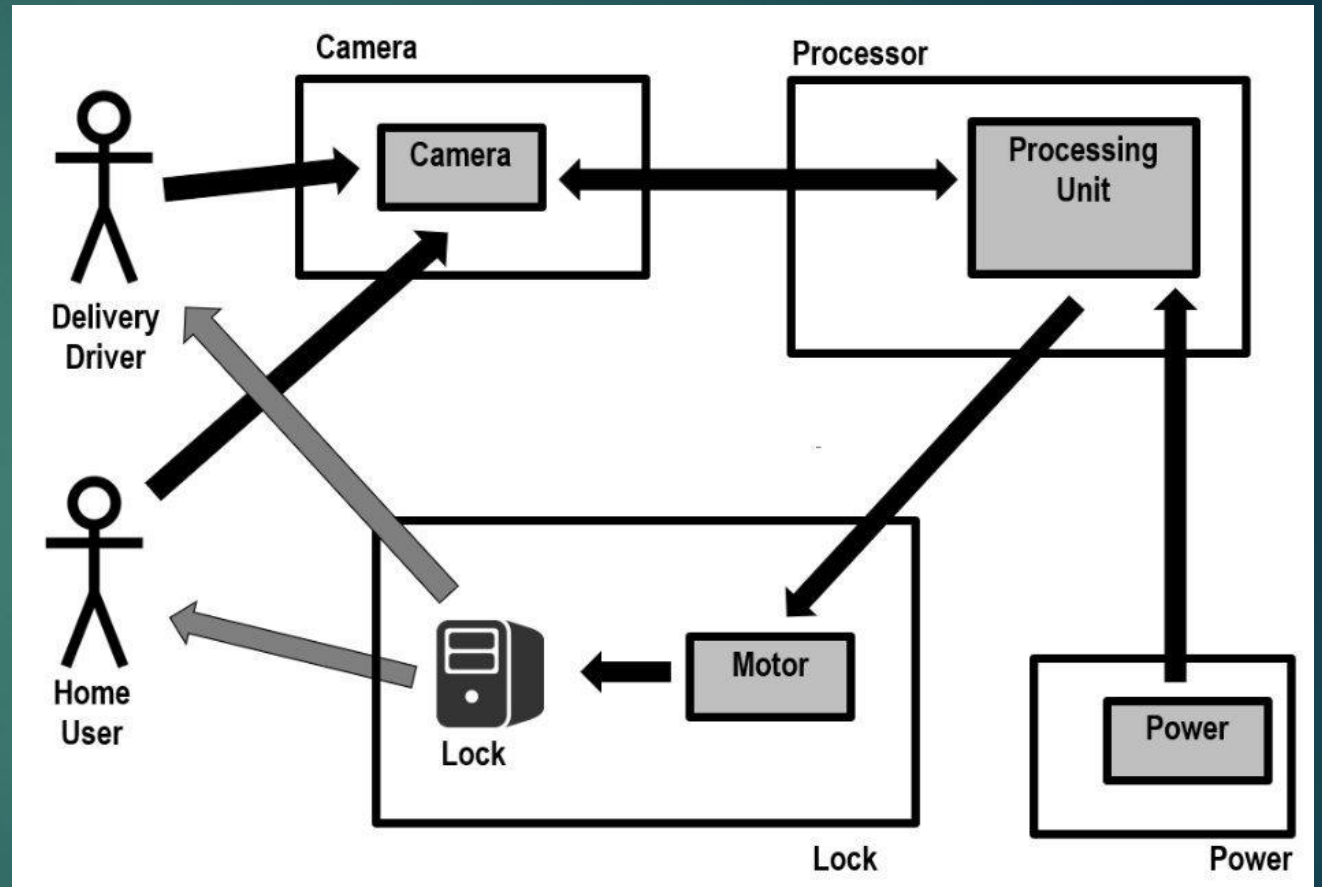
The Package Smart Lock:

- ▶ Attachable to any entry point (doors, gates, hatches, lockers, and more)
- ▶ Creates a custom secured storage
- ▶ All package size and shapes supported

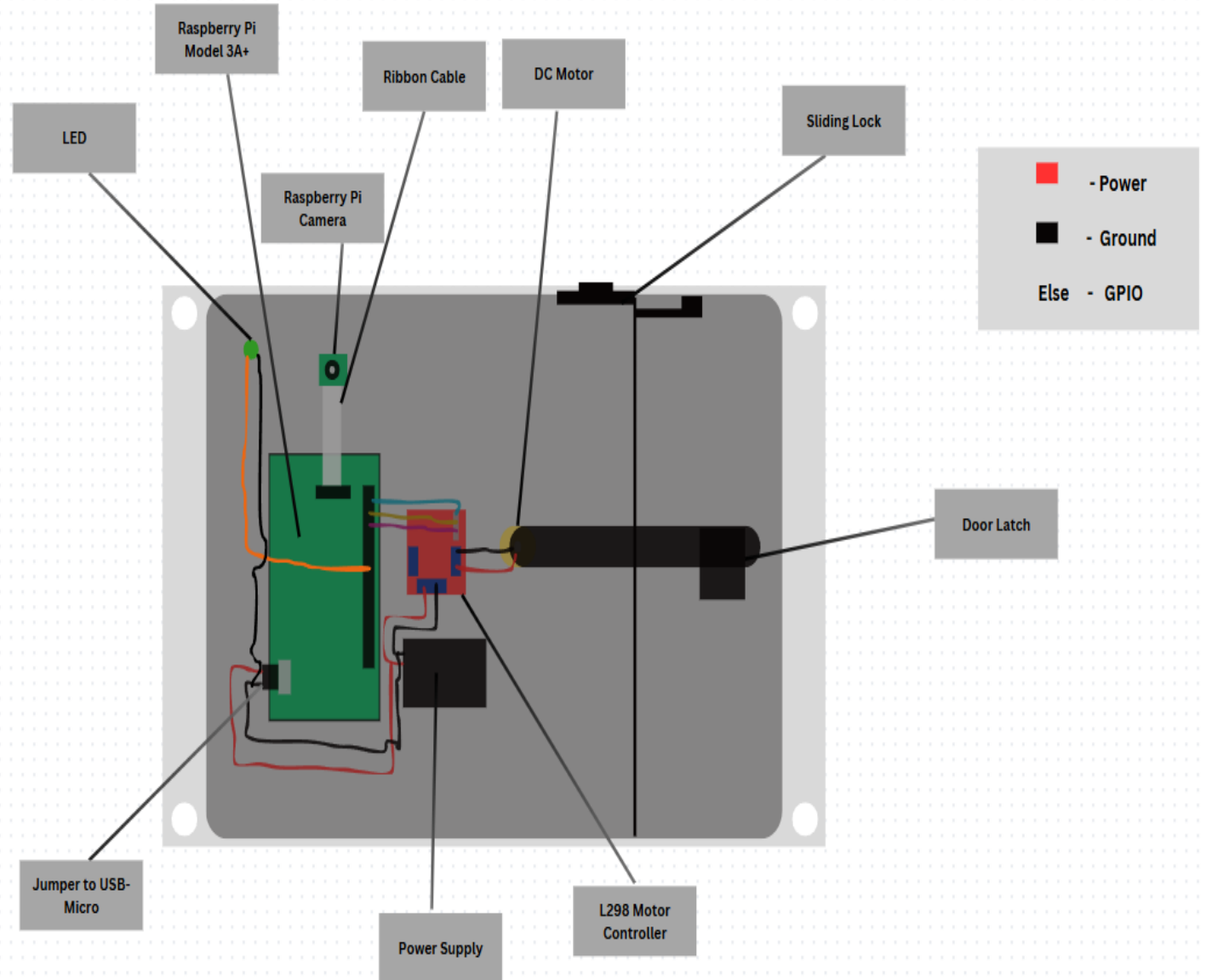
Critical System Requirements

- ▶ **Lockability**
- ▶ **Un-lockability**
- ▶ **Passcode Recognition**

HIGH LEVEL DESIGN



LOW LEVEL DESIGN





Package Smart Lock Guide

- ▶ Add custom passcode through app
- ▶ Add passcode on Address line 2 for package label
- ▶ Homeowner shows printed/electronic text to scanner
- ▶ Delivery Personnel shows package label to scanner



LIVE DEMO

TEST RESULTS

LEGEND	
SUCCESSFUL -	
UNSUCCESSFUL -	

Unlocking Time After User Verified			
Test	Desired(s)	Actual(s)	Difference(s)
1	2	1.69	0.31
2	2	1.65	0.35
3	2	1.72	0.28
4	2	1.64	0.36
5	2	1.67	0.33
6	2	1.71	0.29
7	2	1.65	0.35
8	2	1.67	0.33
9	2	1.7	0.3
10	2	1.63	0.37

AVERAGE TIME = 1.673 seconds

TEST RESULTS CONTINUED

- ▶ System scanner successfully recognized valid passcode
- ▶ System Scanner successfully rejected invalid passcode
- ▶ Relocking system not yet added

FUTURE WORK

- ▶ Allow system to be able to relock
- ▶ Outer shell for the system
- ▶ Create app for passcode/address setup
- ▶ Allow system to save recordings in app

Conclusion

- ▶ Allows homeowners to create a custom secured storage
- ▶ Passcode Recognition Scanner makes verification simpler
- ▶ The Package Smart Lock secures packages of any size and shape

WORK CITED

- ▶ Security.org - <https://www.security.org/package-theft/annual-report/>
- ▶ ValuePenguin - <https://www.valuepenguin.com/porch-pirates-survey>