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Abstract

The hardware team is tasked with creating a smart bicycle lock to be used with the bicycle share system. The main purpose of this group is to integrate a physical interface and security system into the bicycles. The system will be integrated with the mobile app system to be used for selecting and reserving a bicycle. Also the system will use low power consumption for incorporation of solar panel battery system.

Motivation and Background

Modularity. Design a system that can be completely independent of docking station and can be accessed from anywhere.

Accessibility. Easy to find and reserve bicycle from a web browser or mobile device or directly from the keypad interface on the bike.

Flexibility. Park the bicycle at a hub location or any bicycle rack in the system area.

The Device:
• It will not require a lot of power (completely off the grid… batteries and solar panels)
• Is simple to use and secure
• Is compact and light weight

Design Approach

• Used to be controlled with Arduino Mega 2560
• Now Controlled by a Raspberry Pi 1 B+
• Has 16X2 LCD and 4x4 keypad for the display
• Works by triggering the lock when the correct code is entered
• Coded with Python and PHP

Current Design	
Pros	Cons
• Simple to interchange parts • Integrated Network features	• Not able to be tracked outside of signal range • Inefficient power design

Schematics and Models
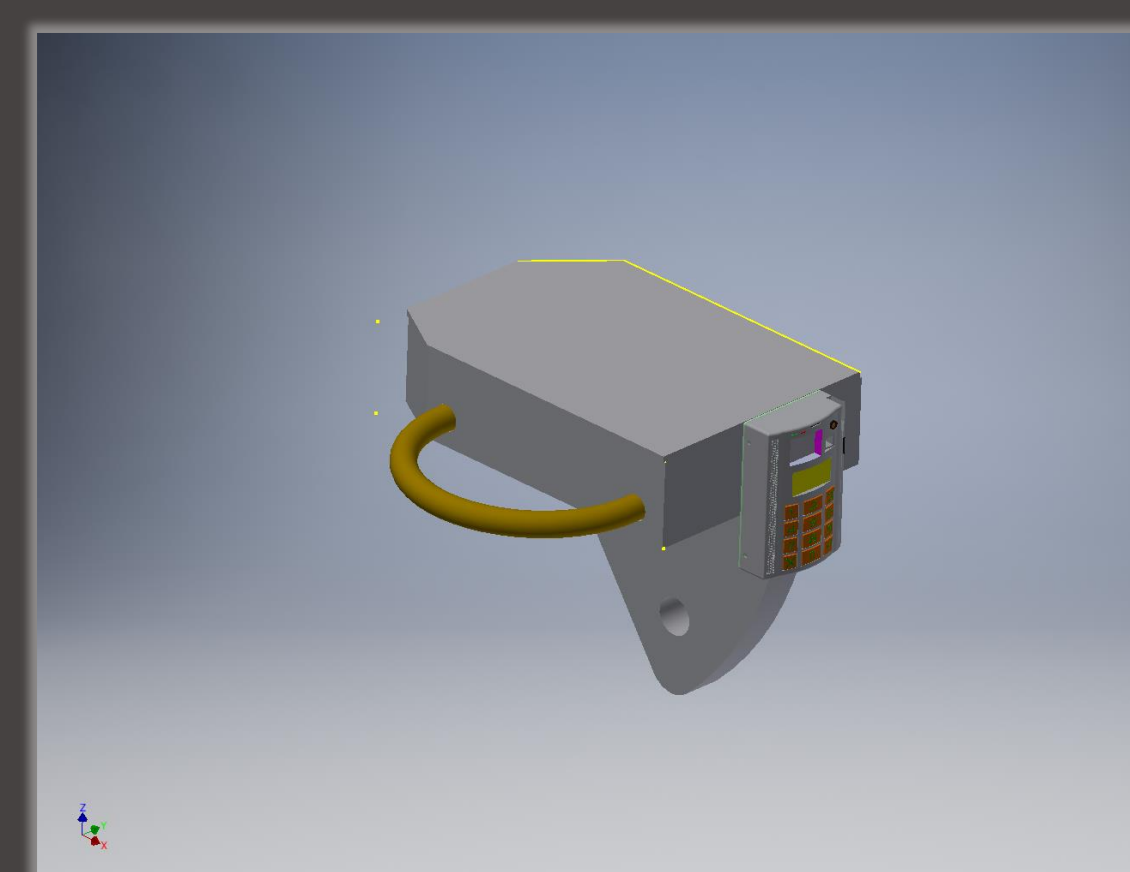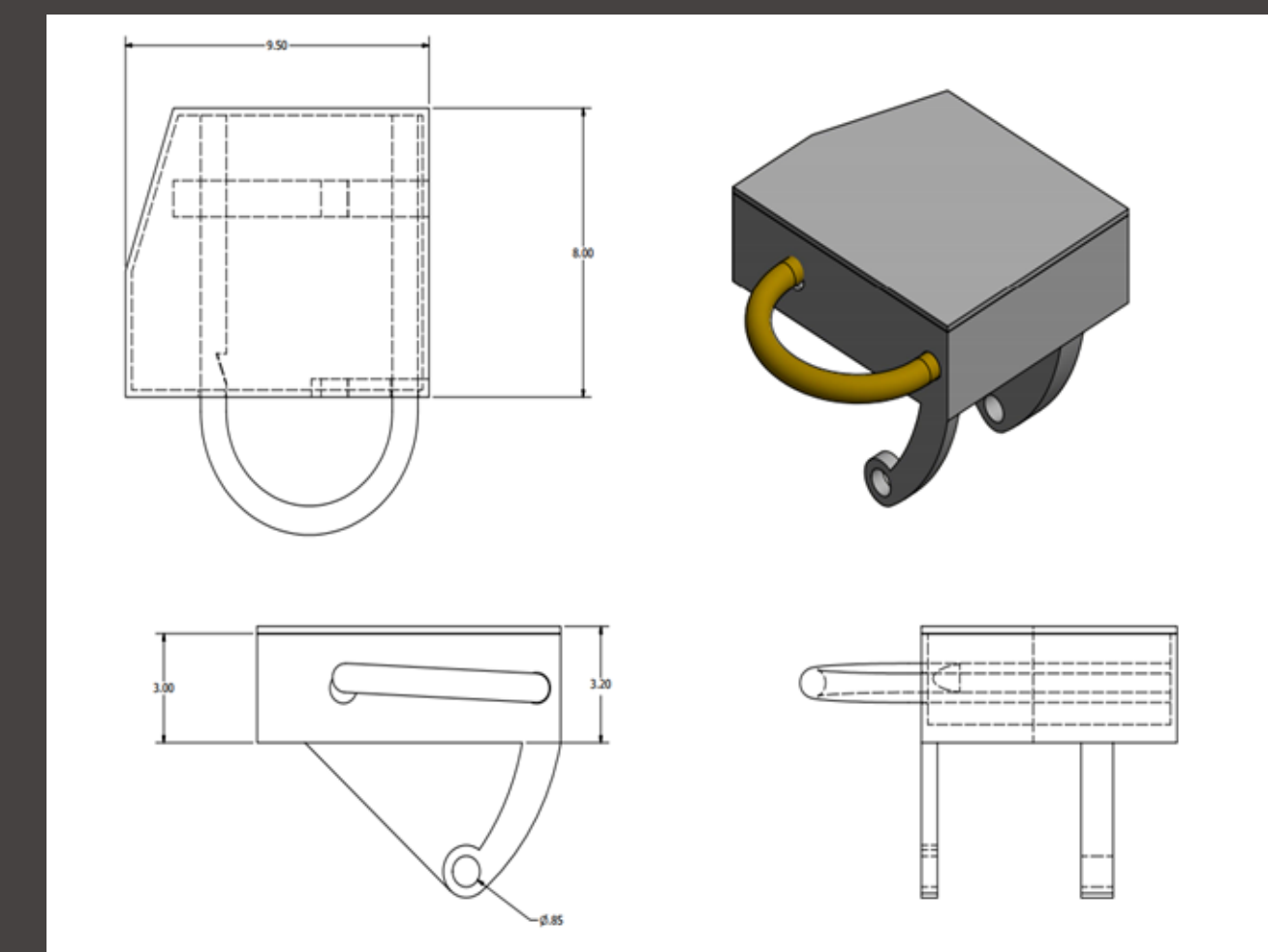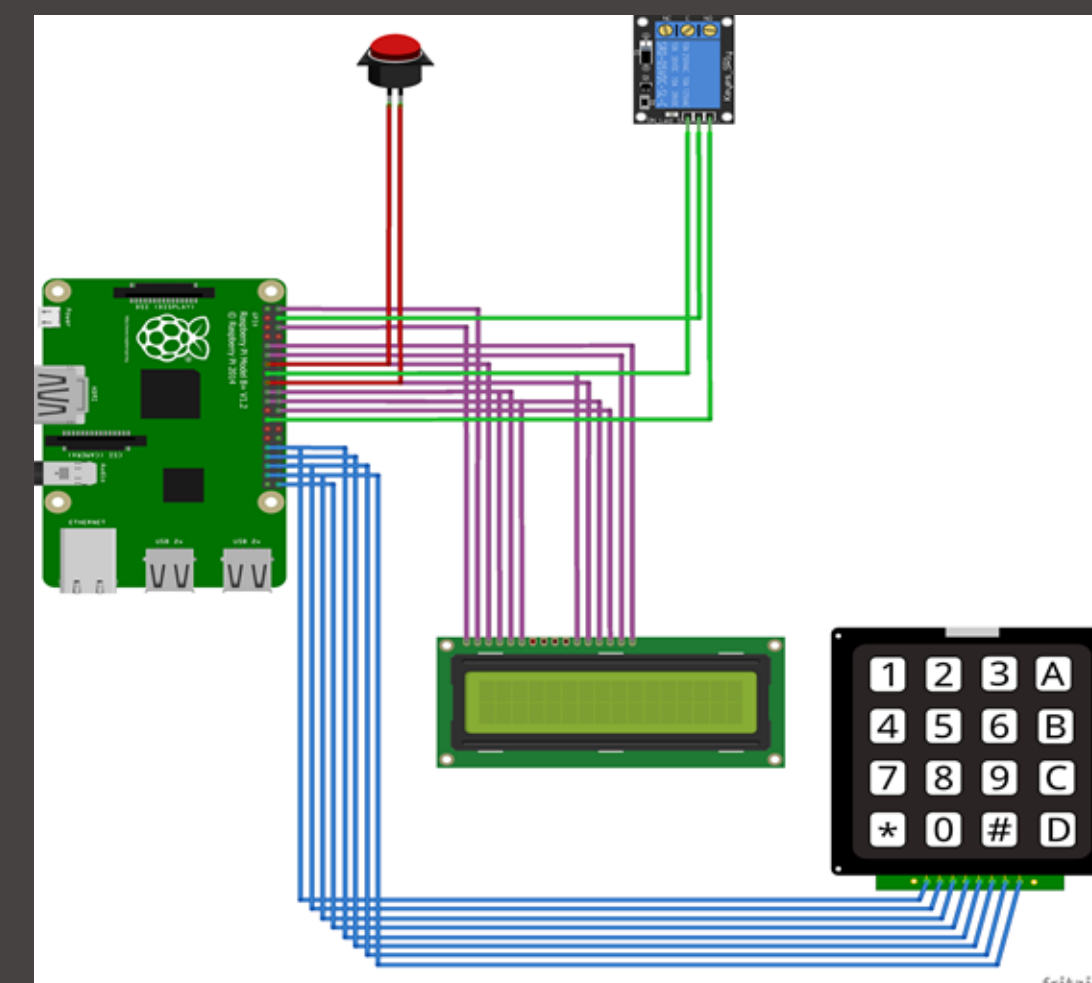
Conclusion

With this system, the modern bicycle sharing could become more versatile and available to all sorts of demographic. We are united through accessible technology and common interest. This system will improve commuting life and create a enhanced metropolis and city living experience

In future drafts of the designs:
• The case will be downsized
• The power consumption will be reduced
• The code count will be decreased
• Stronger and more durable materials
• More reliable tracking

Acknowledgements