(POSTER) Combining Design and Entrepreneurial Mindset Development: Motorcycle Detection System

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Combining Design and Entrepreneurial Mindset Development: Motorcycle Detection System

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EAGLE EYE
lane splitting detection

Introduction

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Motorcycles splitting lanes can be common problem in populated cities, especially outside the United States. A team of five engineers (team SPOT) identified a need for a system which can easily detect motorcycles driving between lanes on the road. The development of such product (Eagle Eye) will improve safety and quality of life for both purchasers and motorcyclist.
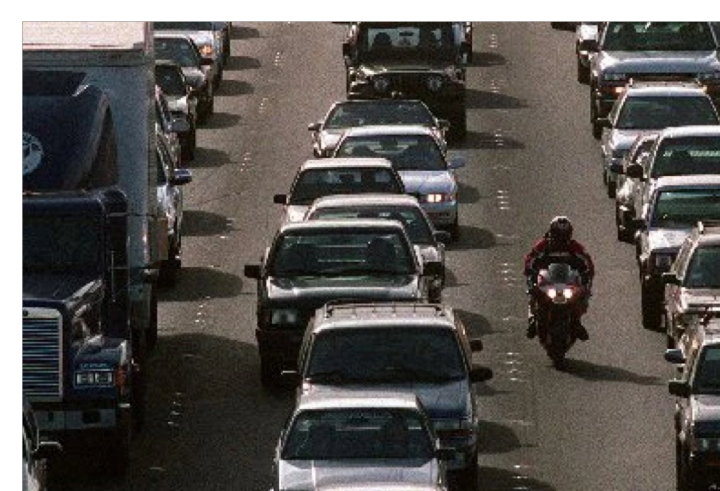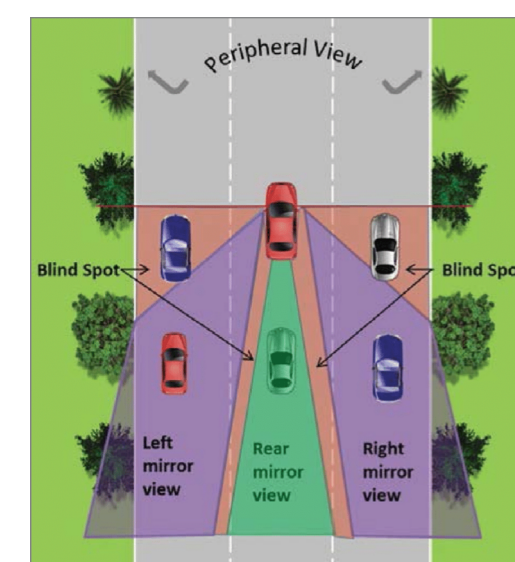

Figure 1: Motorcycle Cutting Lanes

Figure 2: Car Blind Spots

Objective

Improve road safety for both direct and indirect users.

Motivation

There is a dire need internationally for a product that detects motorcycles splitting lanes. Team members are passionate about the benefits that a product like Eagle Eye will bring to developing countries.

Significance

By creating a cheap and self-mountable product for vehicles that detects motorcycles cutting though lanes, road safety would be improved.

Methods

Team SPOT combined entrepreneurial techniques to come up with a solution to a current problem. The different steps [Fig. 2] were crucial to the development and improvement of Eagle Eye.
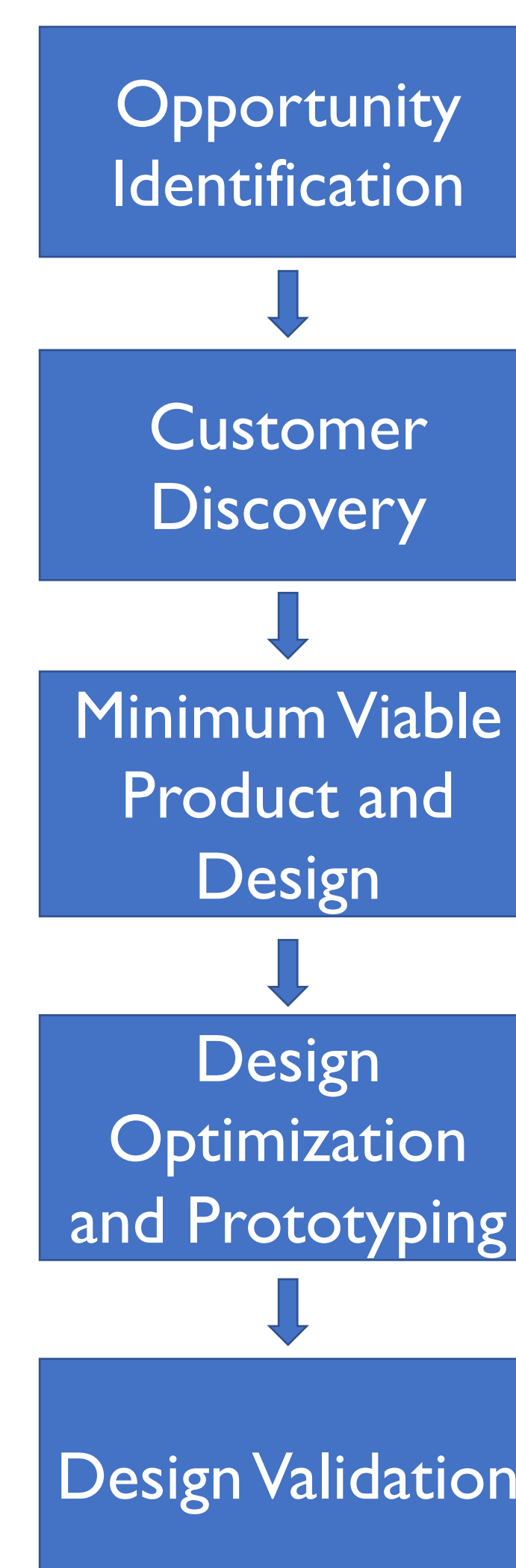

- Opportunity Identification
- Customer Discovery
- Minimum Viable Product and Design
- Design Optimization and Prototyping
- Design Validation

Figure 3: Steps Taken by SPOT

Main Insights:

- Potential customers from 30+ countries think it is a good idea and are willing to buy
- Focus on:
  - Clear Warnings
  - Range of System Vision
  - Weight of Product
  - Waterproof
- Where to separate from competition:
  - Low Cost (>$120)
  - Self Mountable
  - Solar Power

Figure 4: System Block Diagram

Components

Arduino RedBoard by Sparkfun Electronics

LED light

CDM324 Doppler Speed Sensor

Figure 5: Code and Sensor Testing Set Up

Figure 5: Prototype

Results

Testing

For Eagle Eye to be a successful product, it is crucial that a reliable and timely warning is given. Meticulous tests on the coding and speed sensor were done to identify the range of noise data. Those values were filtered with coding.

Conclusion

Conclusion

Team SPOT developed a product based on the need to provide low-cost, self-mountable, and solar-powered motorcycle detection system to help reduce crashes resulting from motorcycle lane splitting. As the testing phase continues, the next steps are to do field testing, explore mounting options and a potential on/off button.

Acknowledgements

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References

[1] Motorcycle Cutting Lanes: https://www.wired.com/2015/06/yes-california-let-motorcycles-ride-cars/
[2] Car Blind Spots: https://www.researchgate.net/figure/Blind-spot-around-a-vehicle_fig2_319851766
[3] Ardunio SparkFun: https://learn.sparkfun.com/tutorials/redboard-vs-uno/all
[4] CDM324 Doppler Speed Sensor: https://www.tindie.com/products/stephanelec/cdm324-doppler-speed-sensor-arduino-compatible/
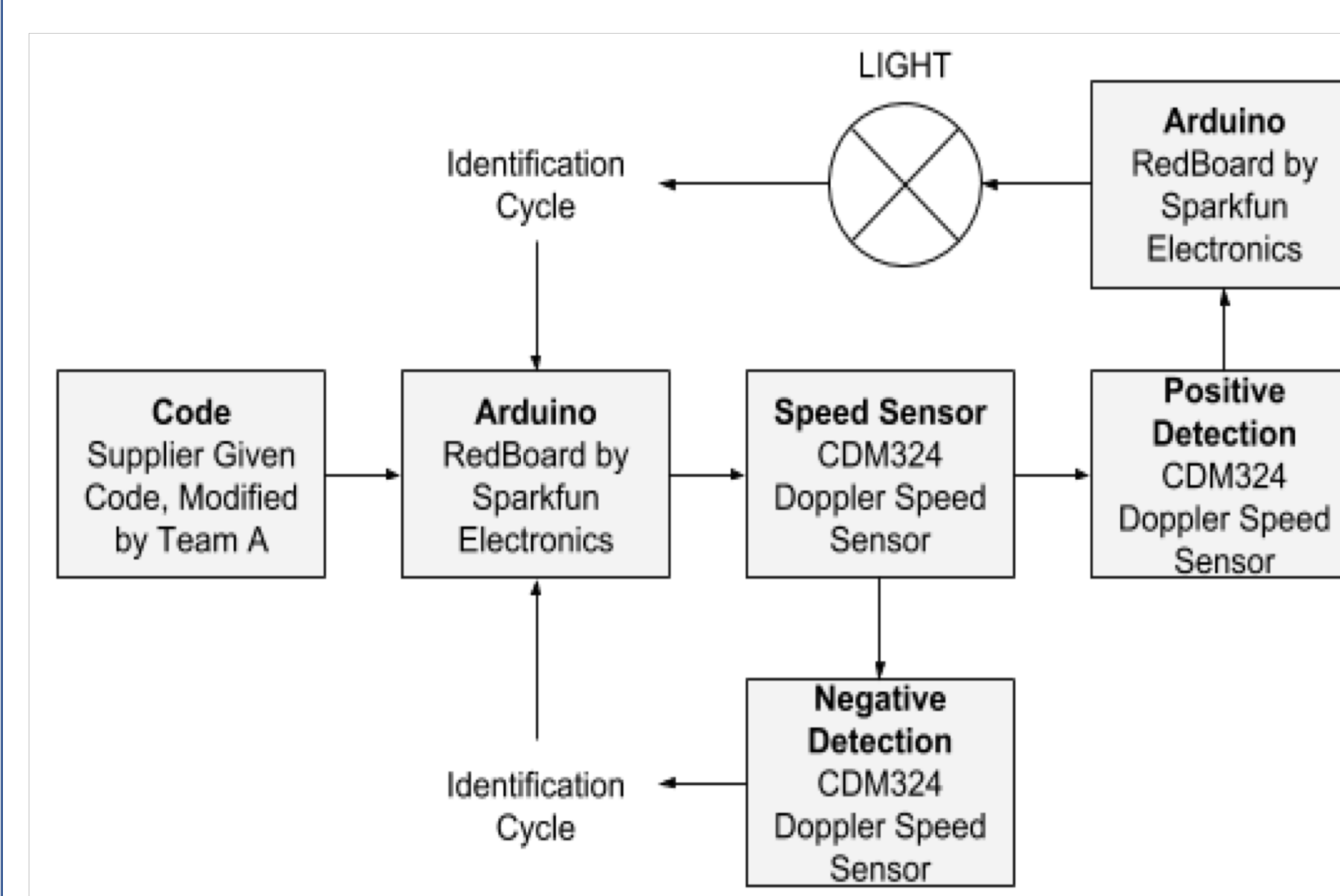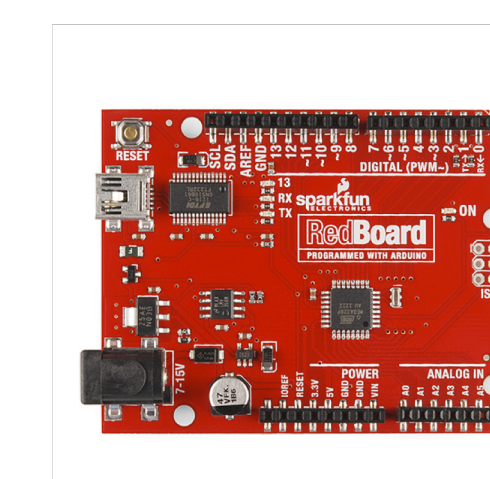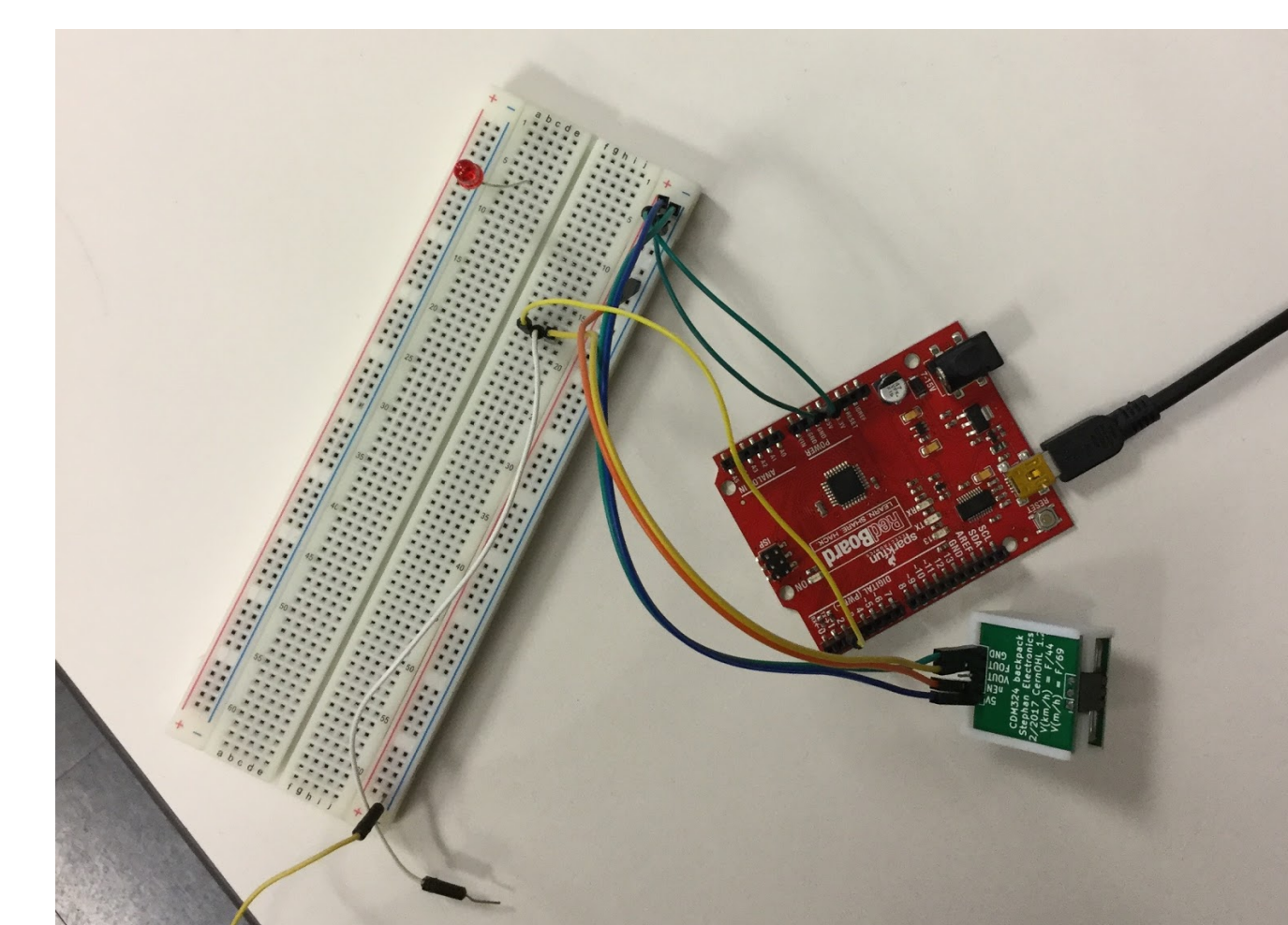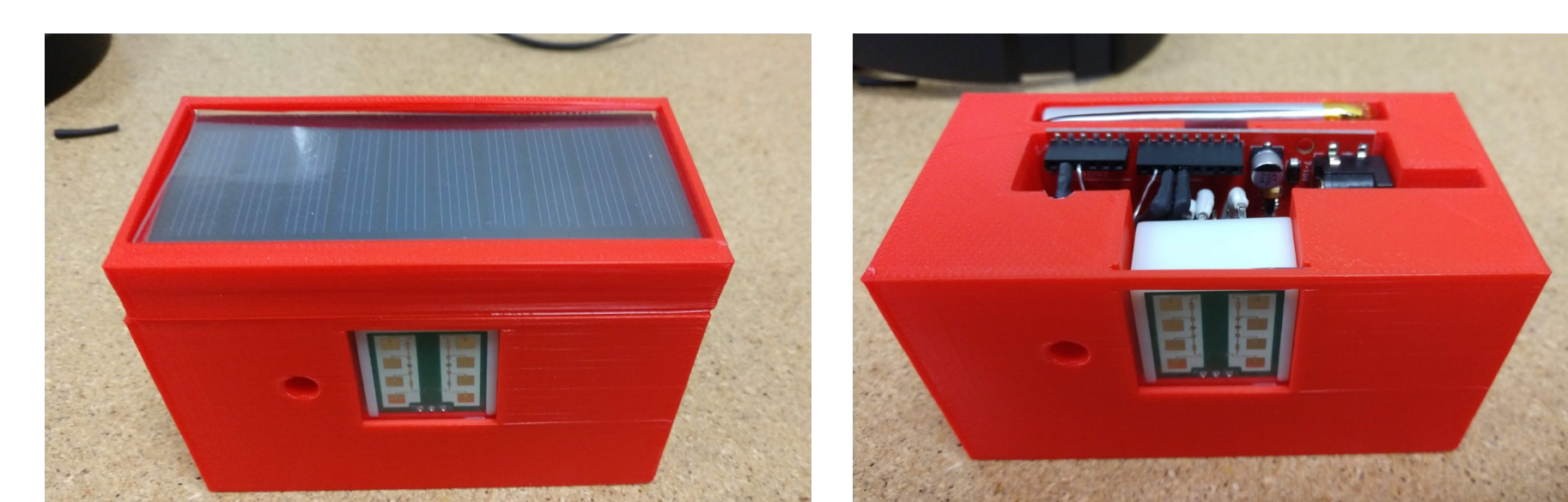[5] LED light: https://www.dx.com/p/diy-3mm-led-light-emitting-diode-set-red-yellow-green-30pcs-2066500#.XHku1INKiYU