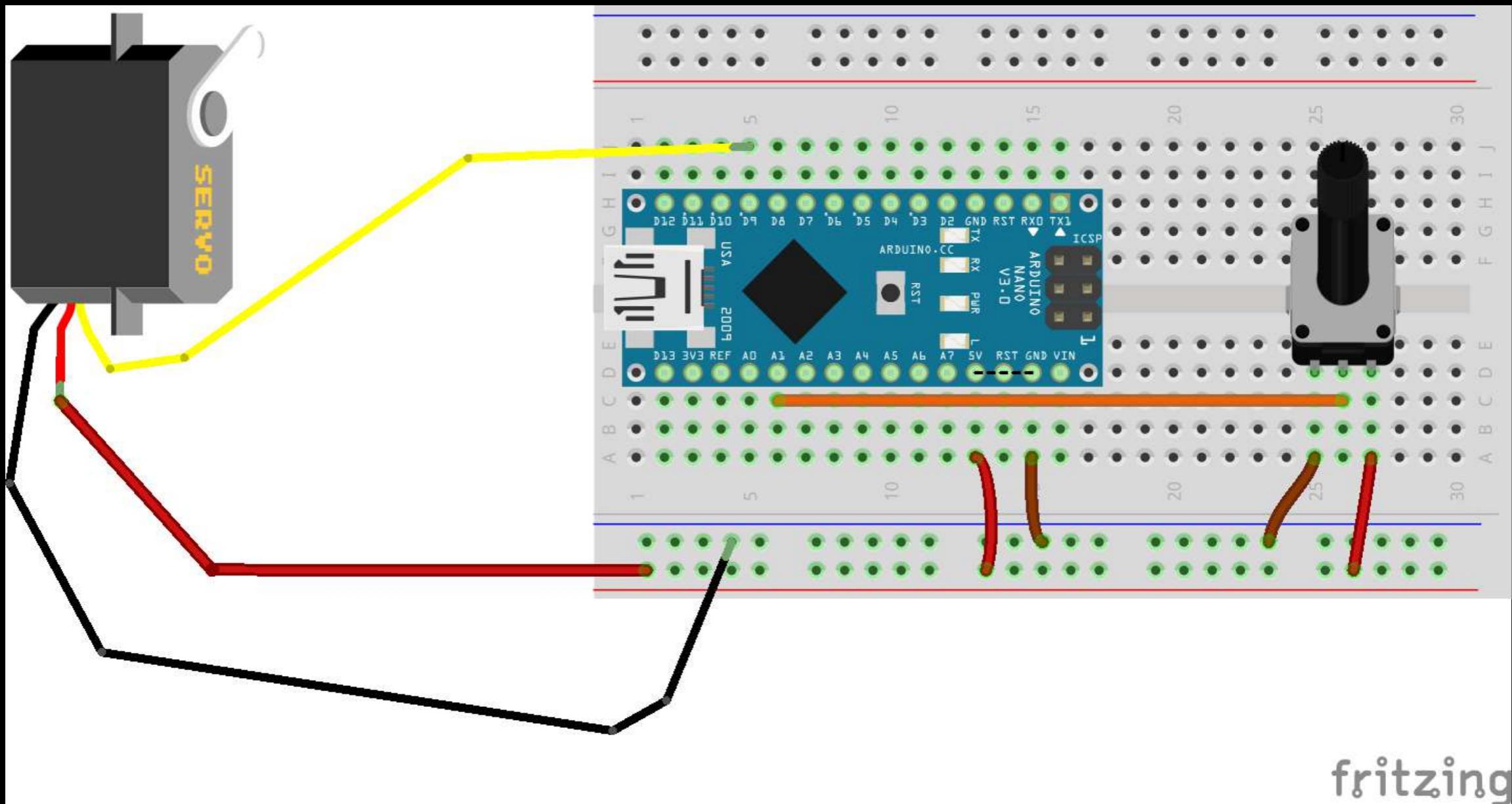
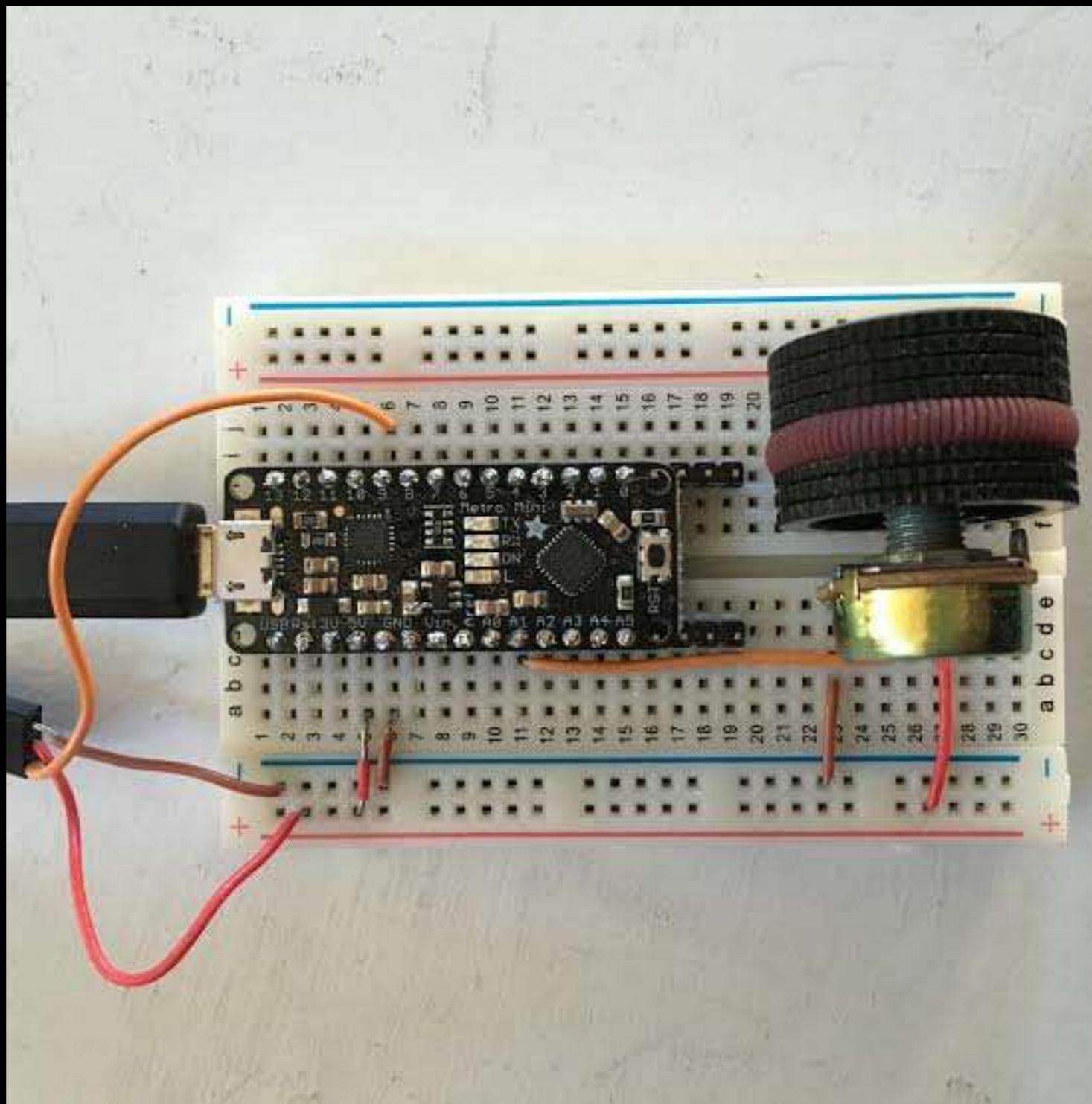


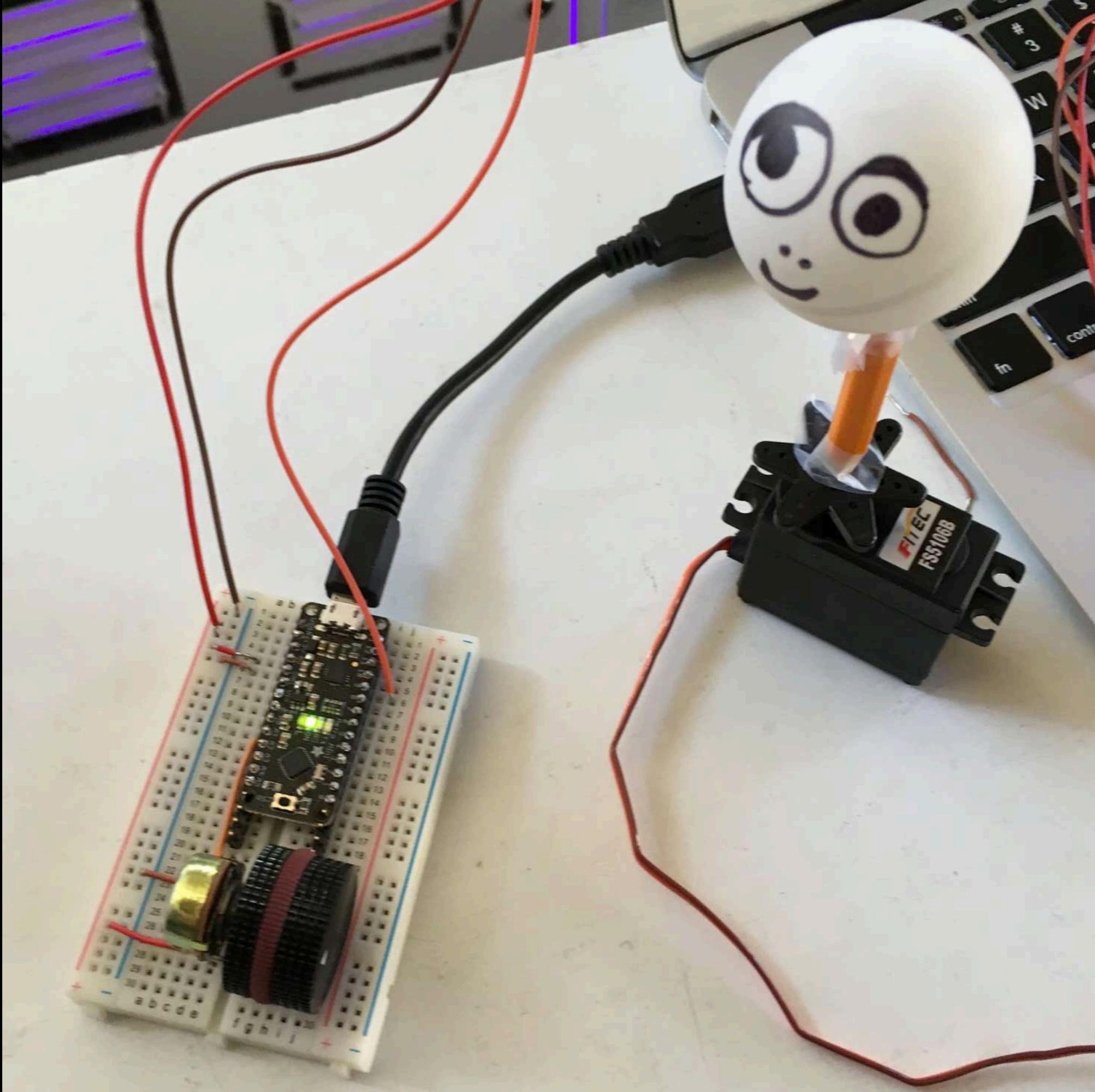
# Interaction Engine Robot

# Simple Arduino circuit

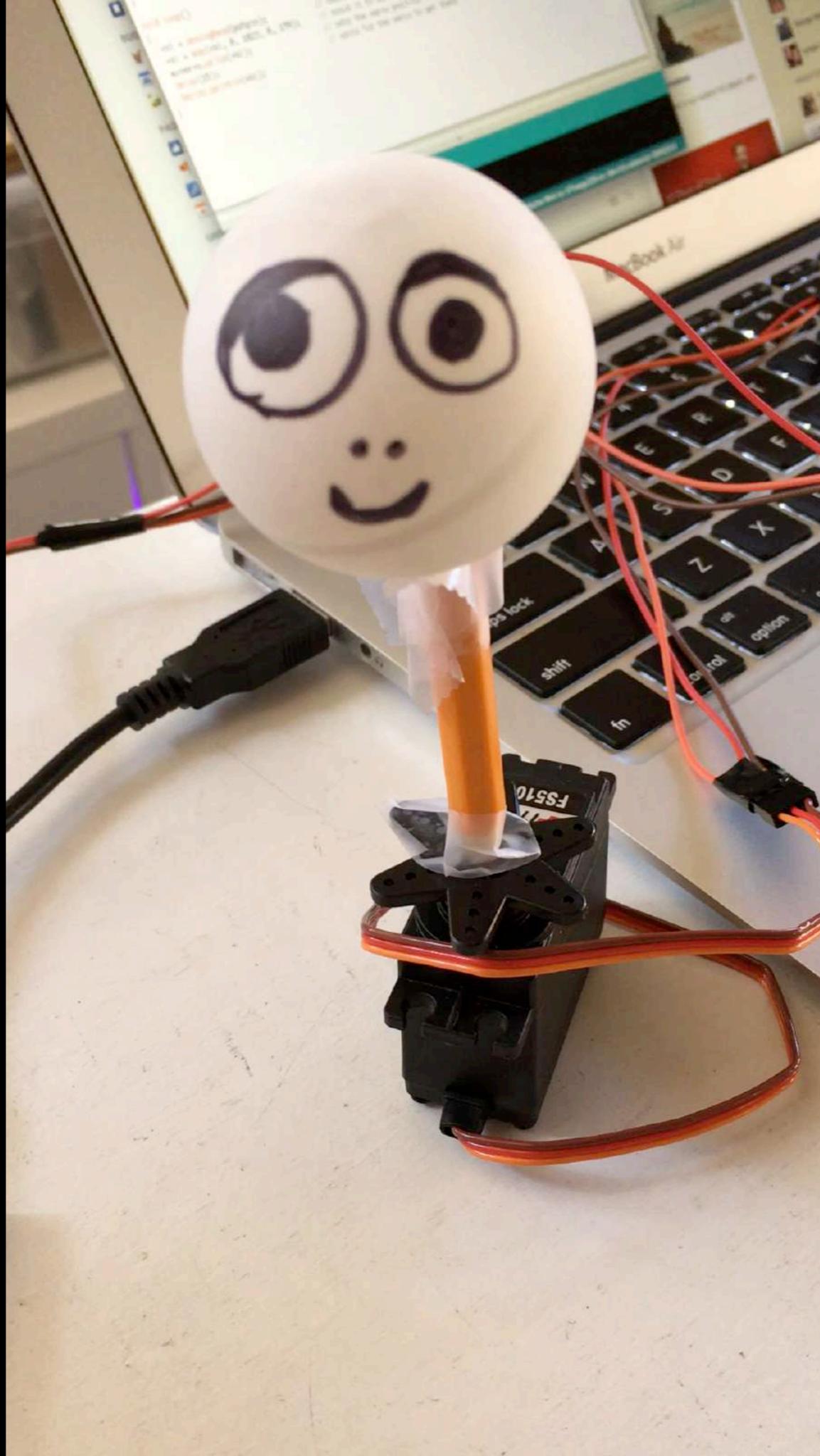


# Simple Arduino circuit

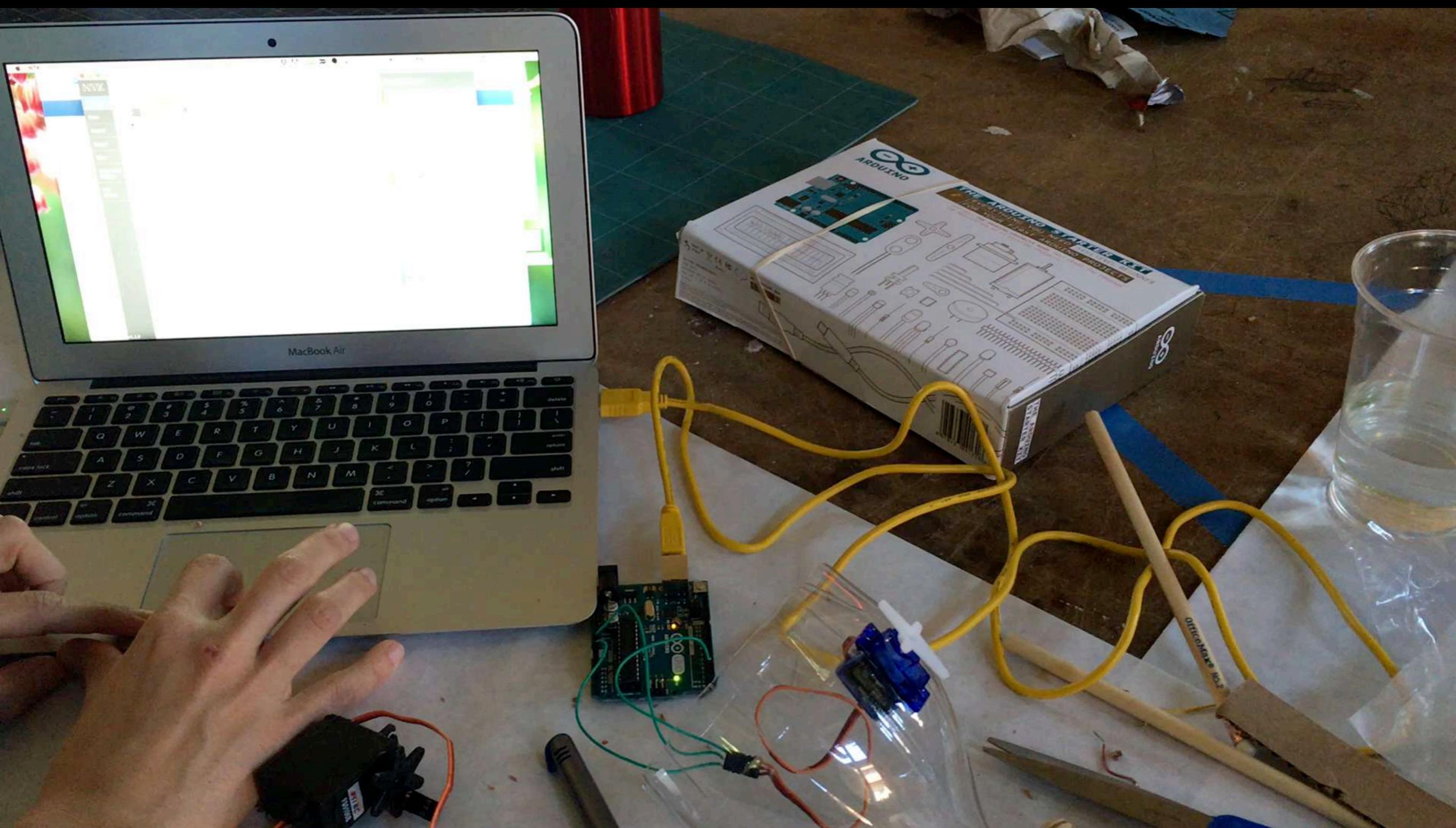




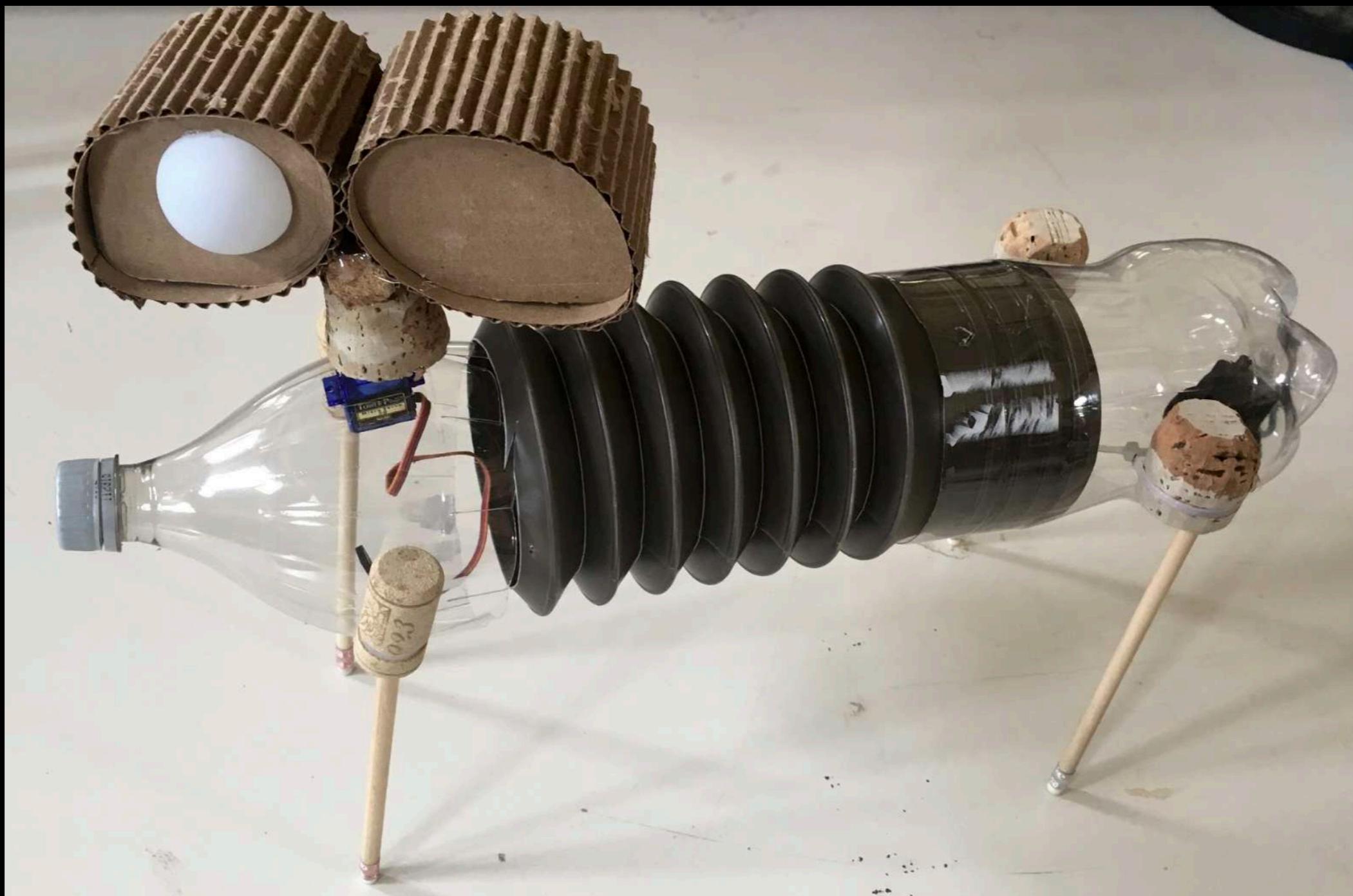
Adding meaning

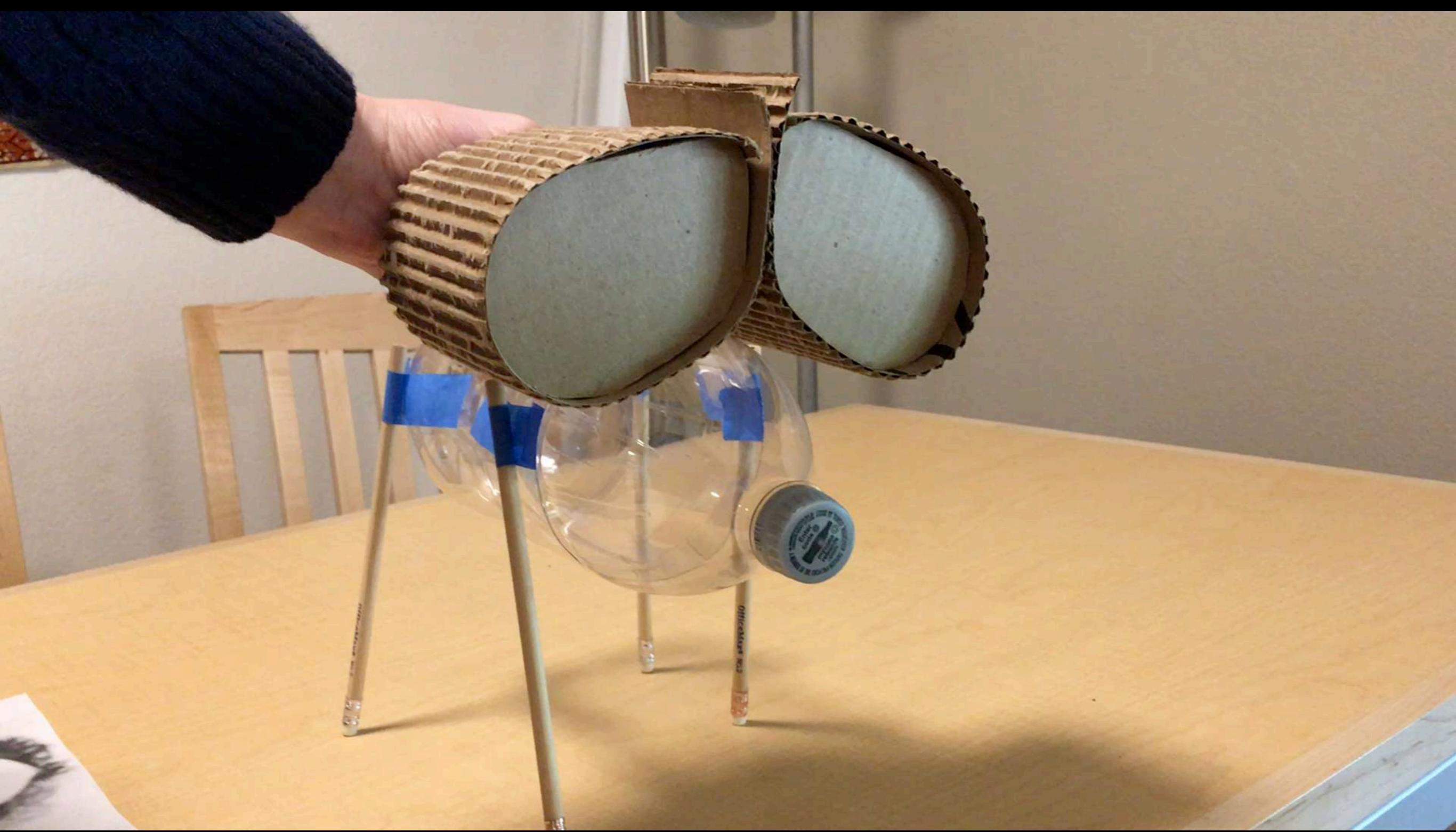


Control from your comp

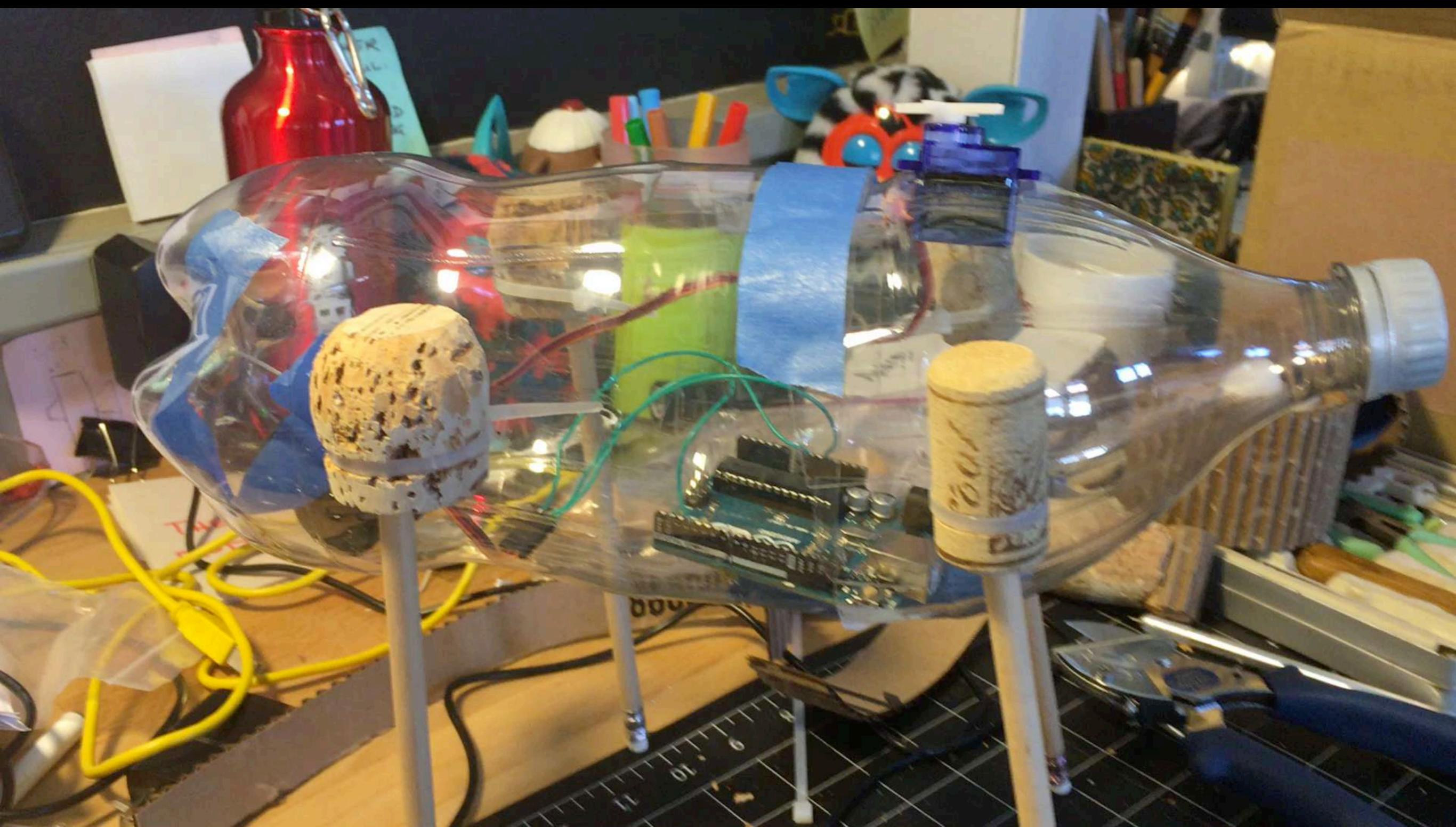


## Adding meaning 2

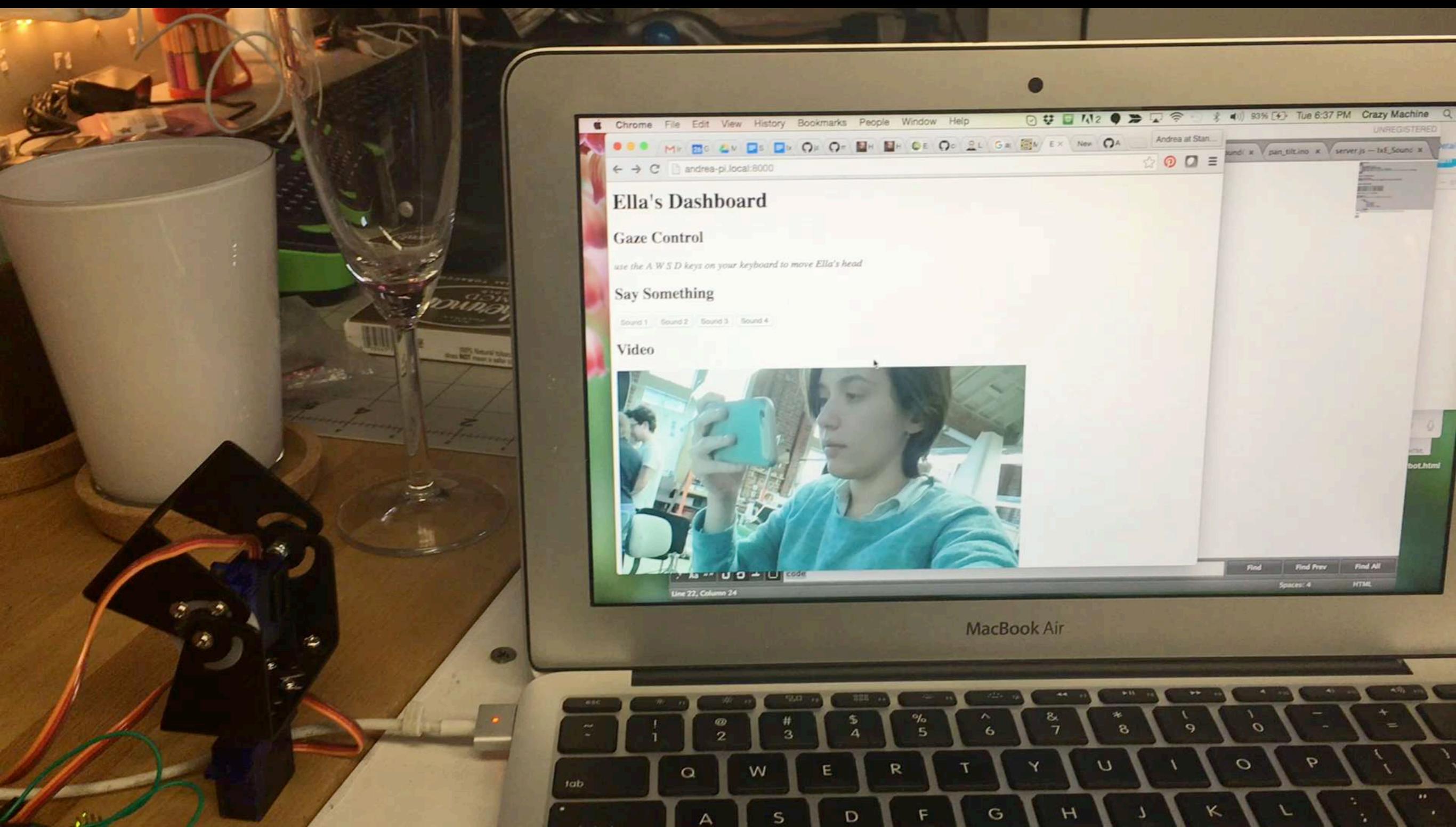




## Movement

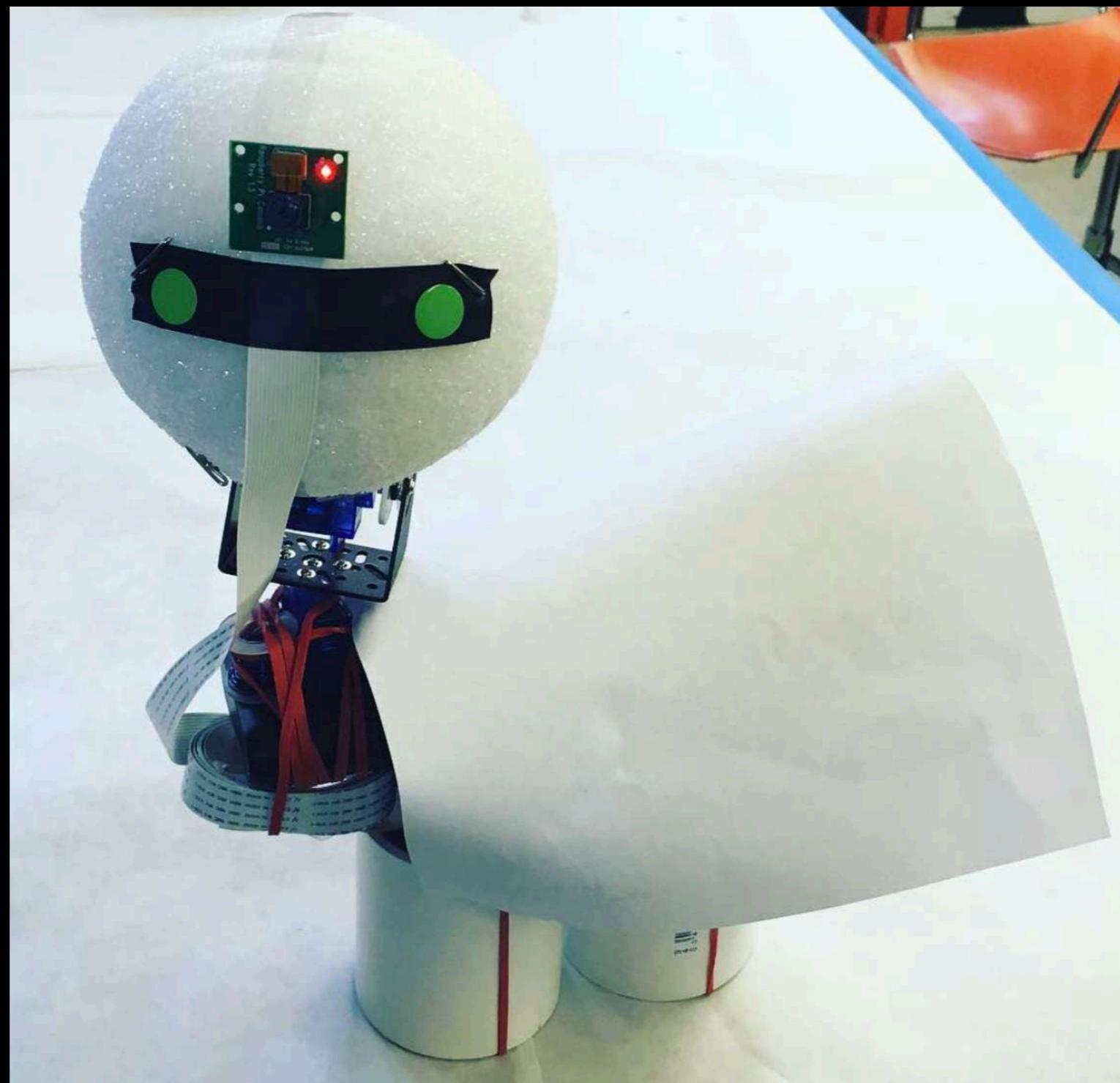


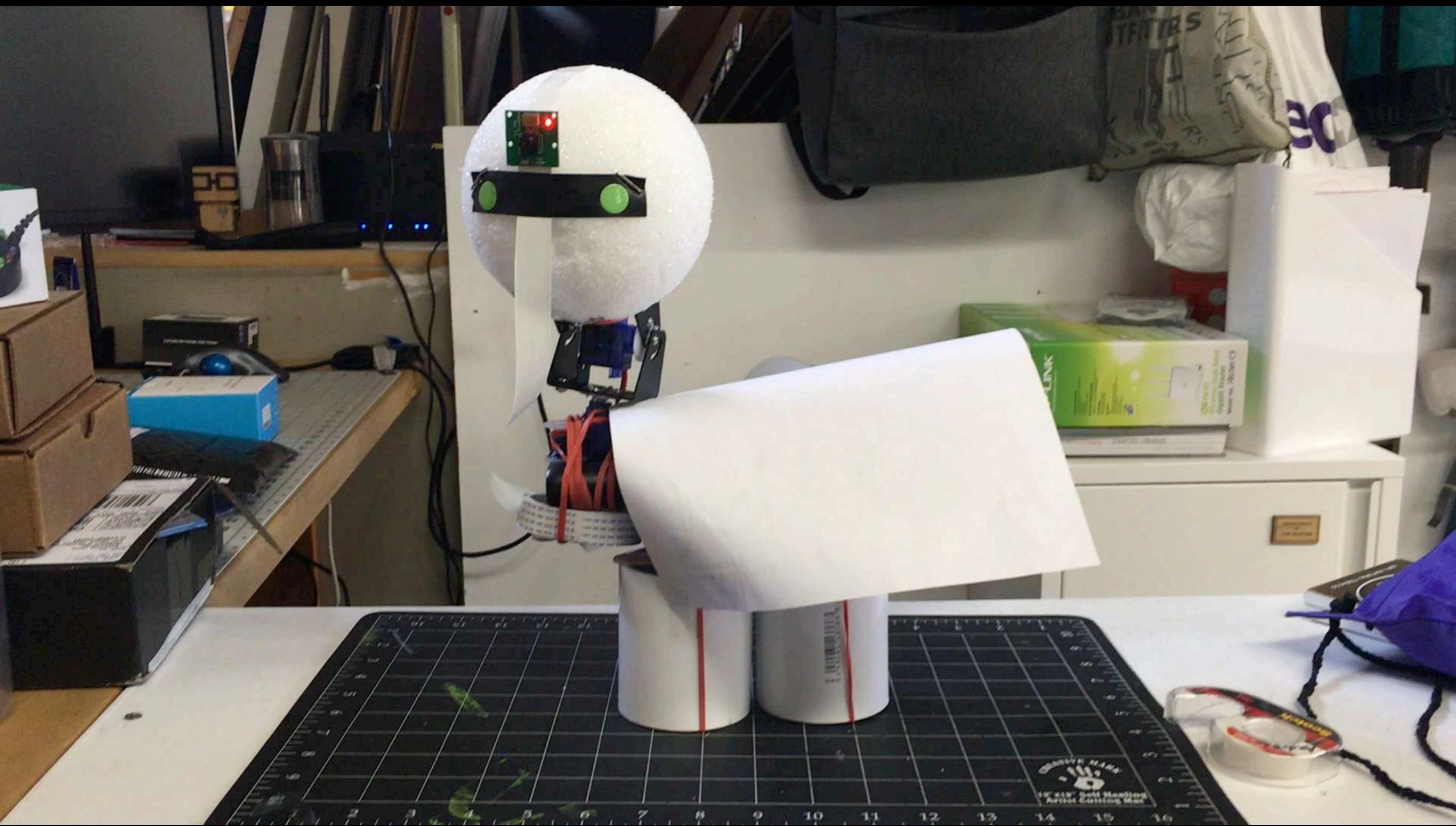
## Functional milestone



Wirelessly controllable, battery-powered, camera stream, sound

**Stand alone**





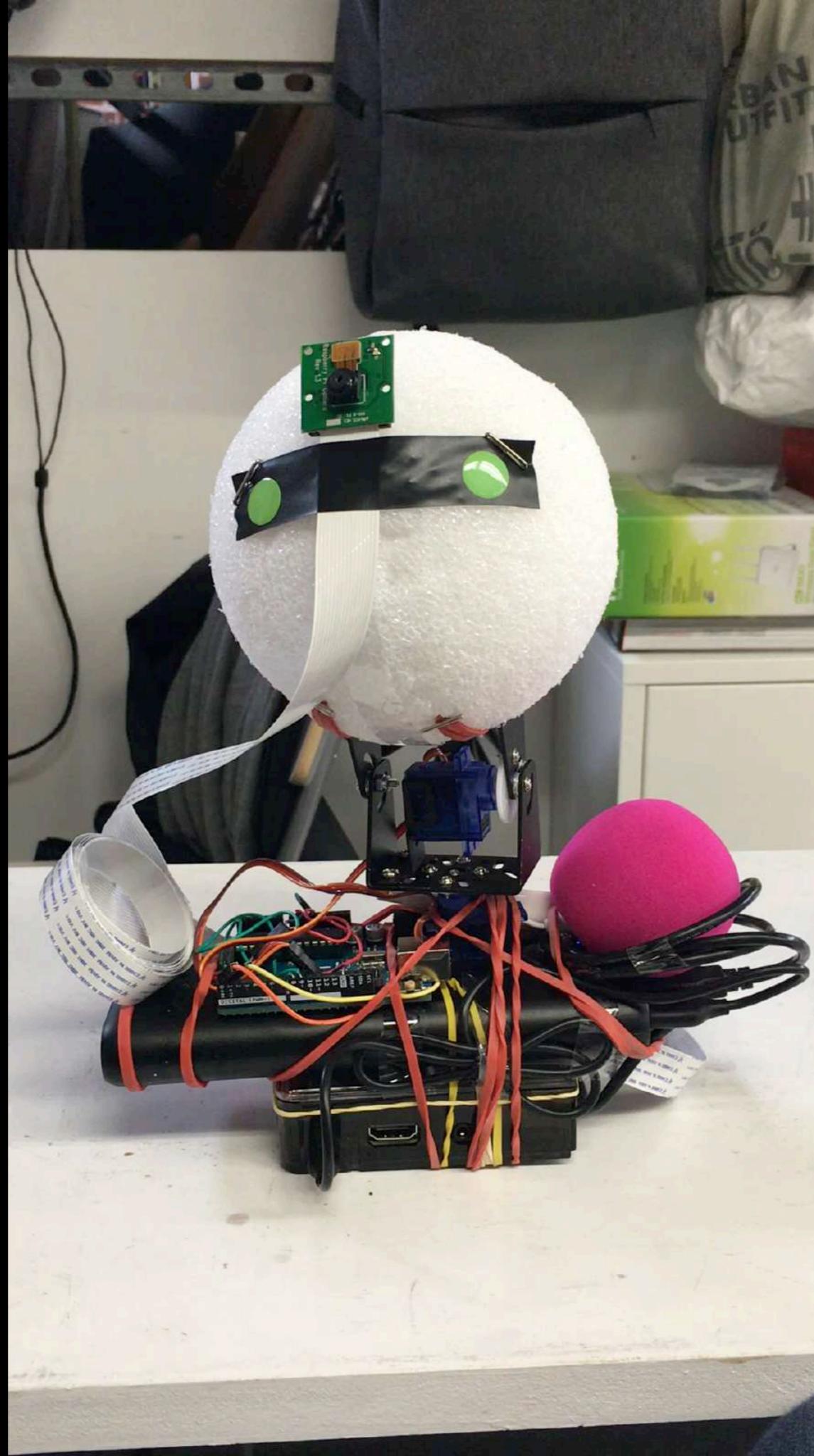
**More stability**

**Camera**

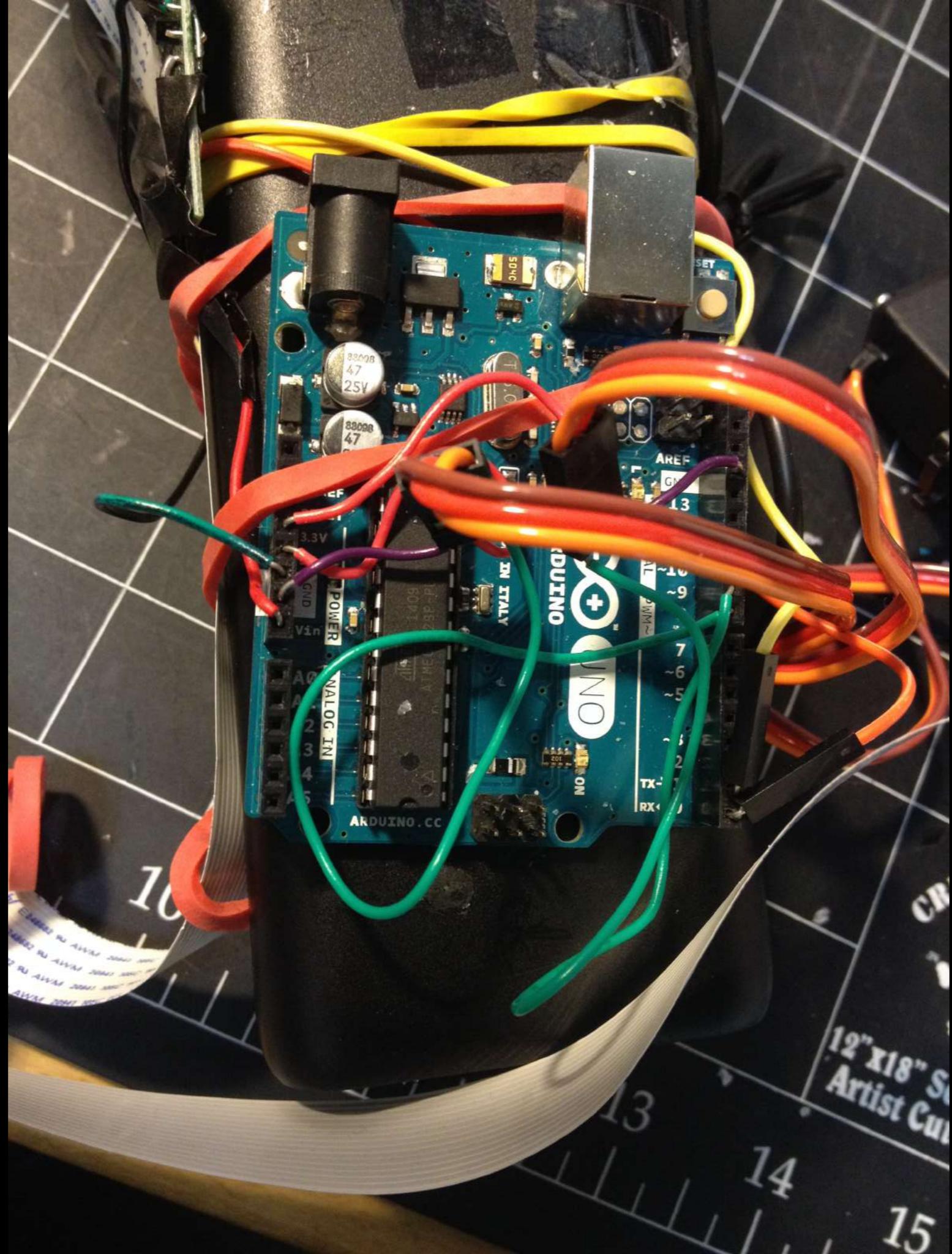
**Pan tilt servos**

**Speaker  
Arduino  
Battery**

**RPi**



Ugly

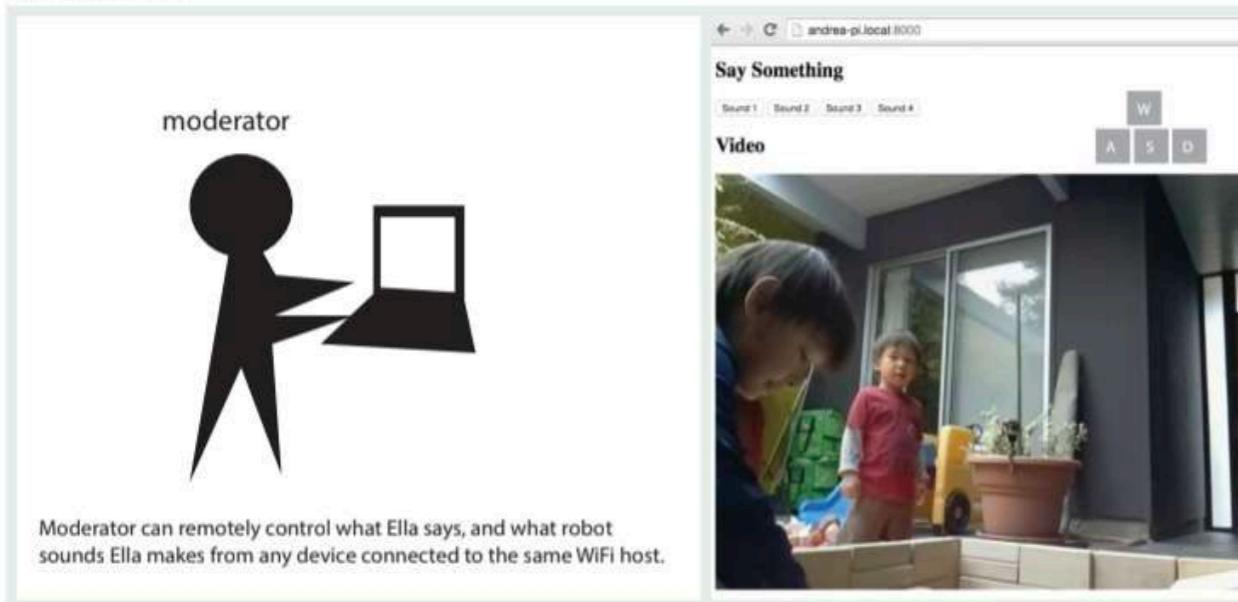


# Ella—the mediator bot

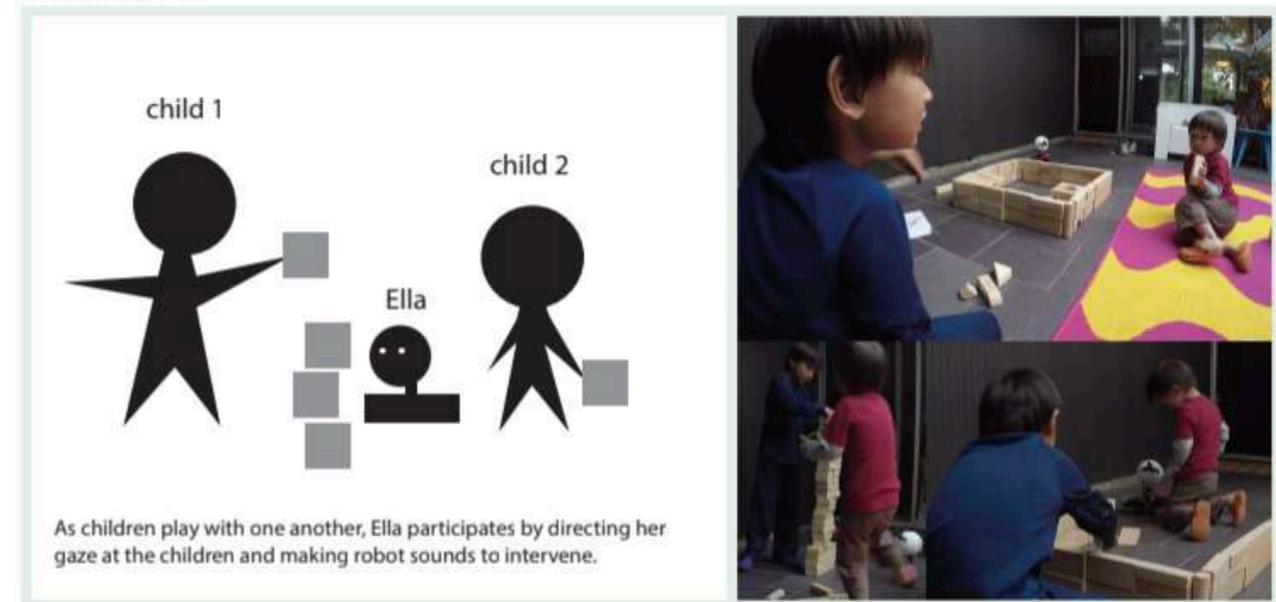
Andrea Cuadra, Nik Matelaro, Malte Jung, Wendy Ju

How can a robot help with emotion regulation in child-child interaction?

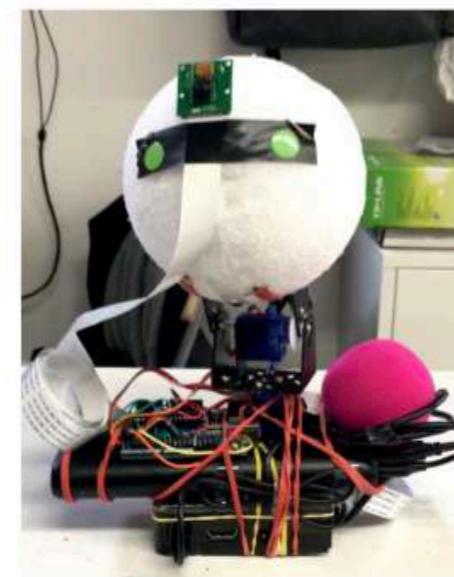
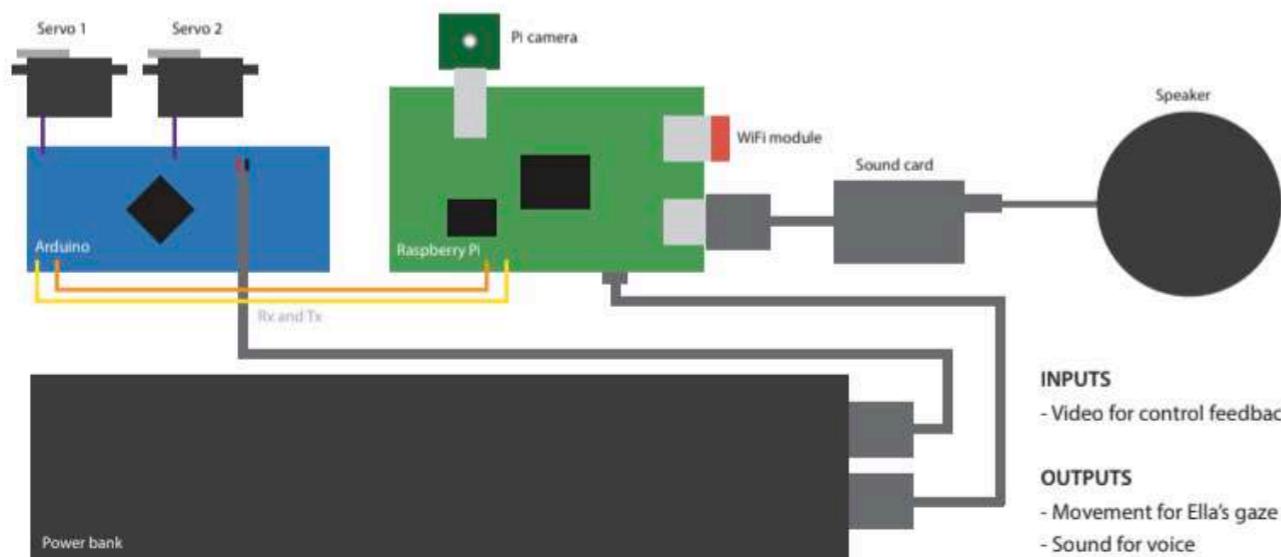
## MODERATION



## INTERACTION



## HARDWARE DESIGN



## INSIGHTS FROM PILOT STUDY

Ella was able to influence conflict in a few different ways by: 1) calling out certain actions 2) distracting an upset child  
Ella had a very strong presence, and the interaction was not referred to as "stupid" as in studies with adults [1]  
The children talked with Ella and paid attention to what Ella was doing and saying  
Ella's appearance seemed to be neutral enough for the study – Ella was immediately recognized as a robot

## NEXT STEPS

Create structured study where two children are asked to build a tower  
Select and pre-test the types of sounds Ella should make depending on whether Ella wants to celebrate, encourage, or reprimand an action  
Explore how this type of mediation can apply to other forms of interactions in learning and playing

## REFERENCES

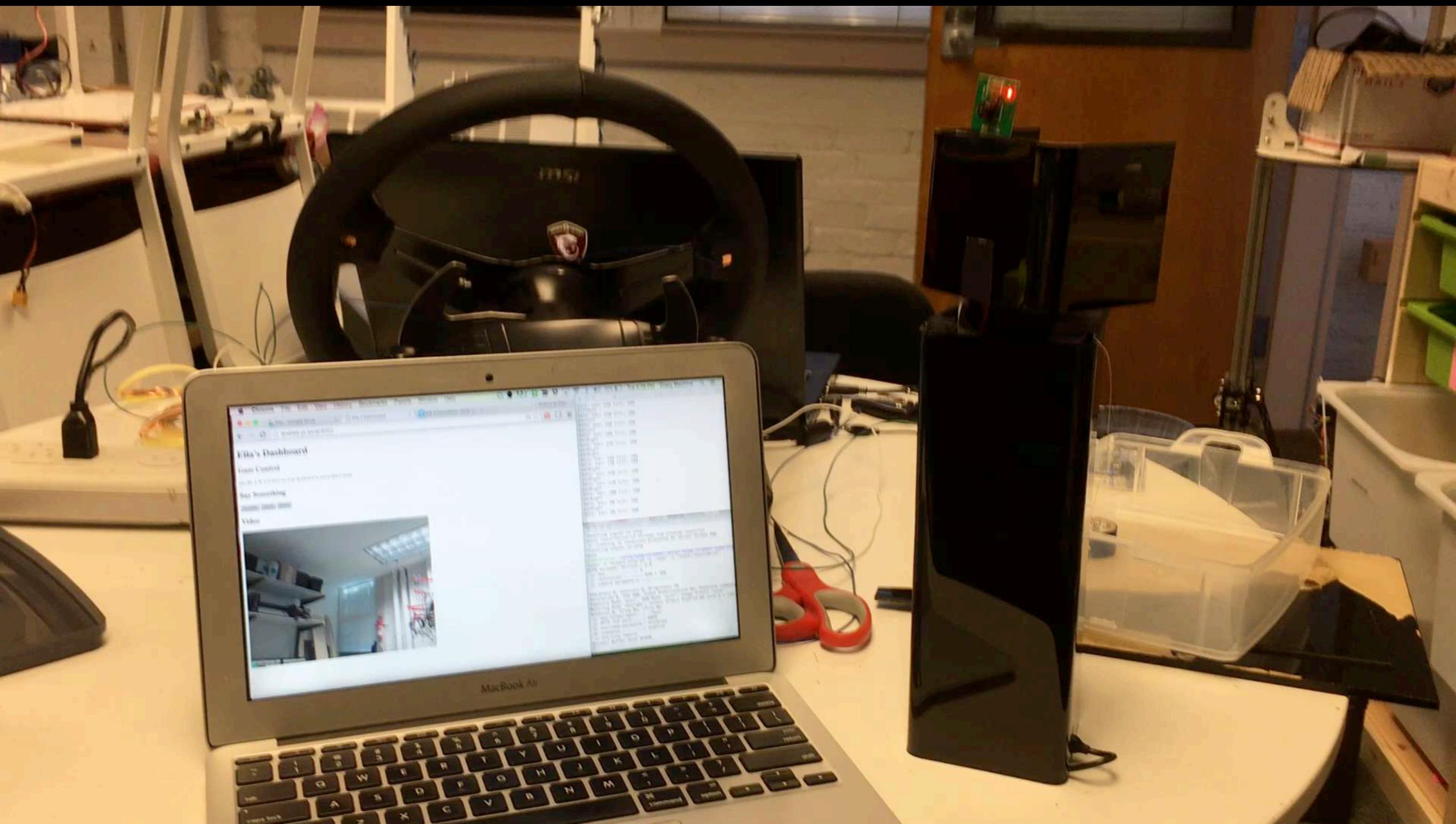
- [1] G. Hoffman, O. Zuckerman, G. Hirschberger, M. Luria, and T. Shani Sherman, "Design and Evaluation of a Peripheral Robotic Conversation Companion," Proc. Tenth Annu. ACM/IEEE Int. Conf. Human-Robot Interact. - HRI '15, no. April 2016, pp. 3–10, 2015.



Taped servos

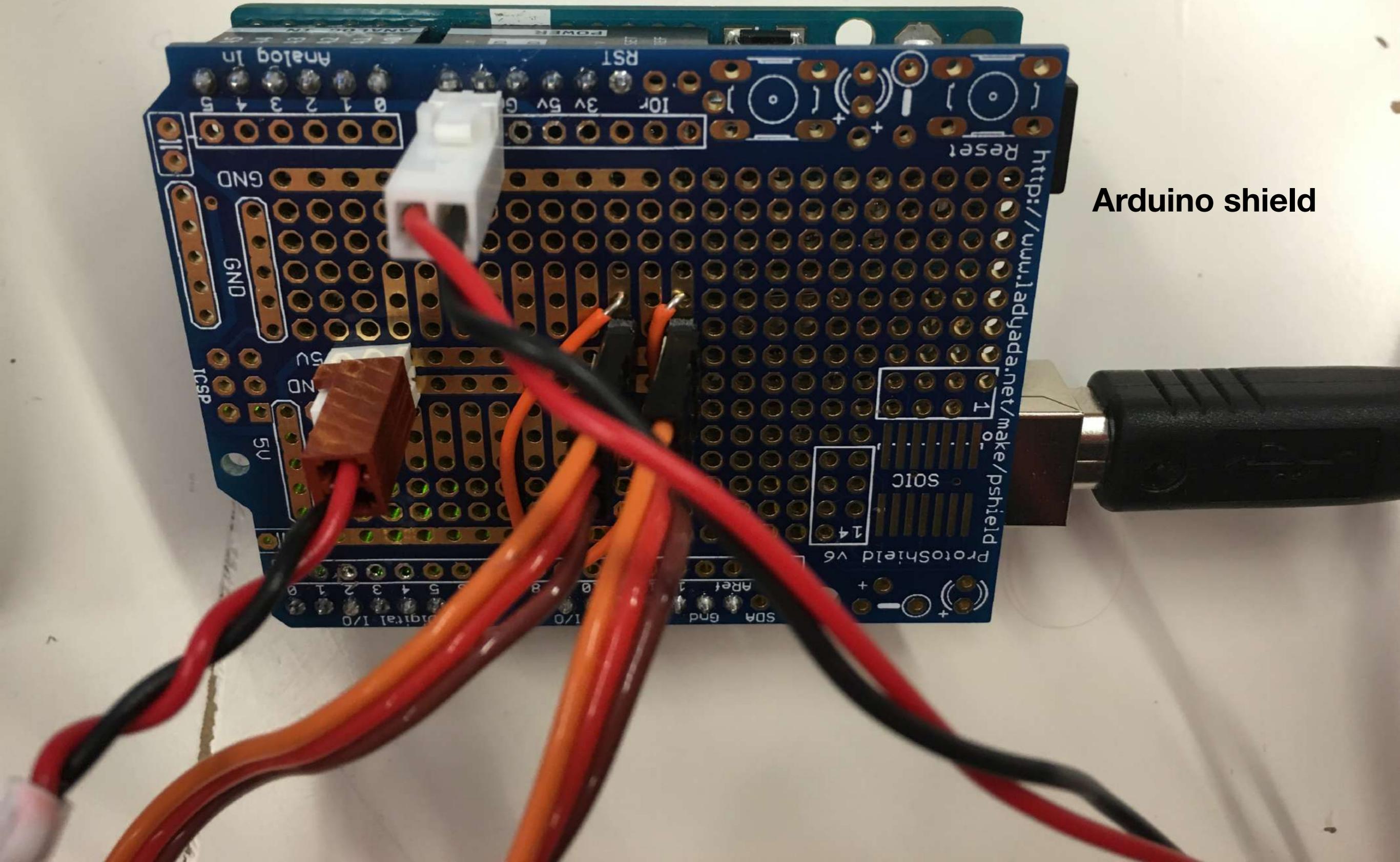


# Working milestone... still using tape, camera still out of place

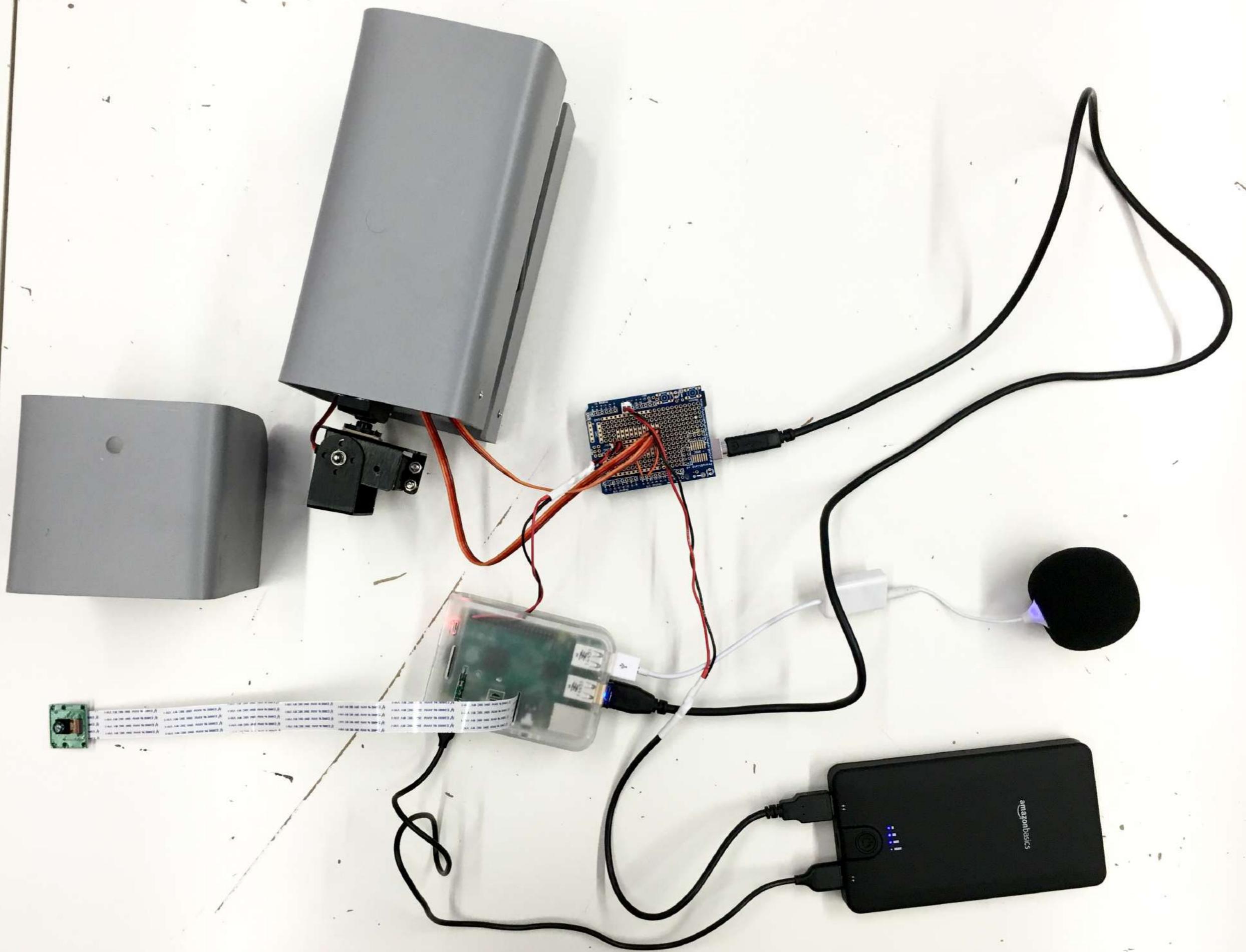


Soldered, robust electronics

## Connectors for protoboards

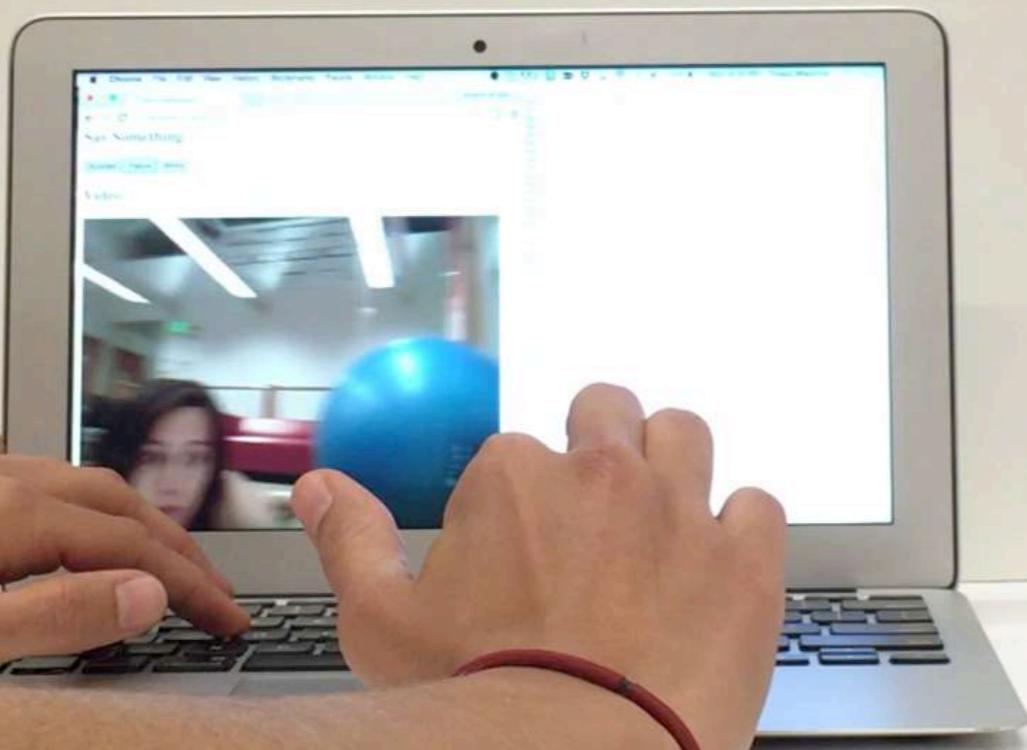


Arduino shield



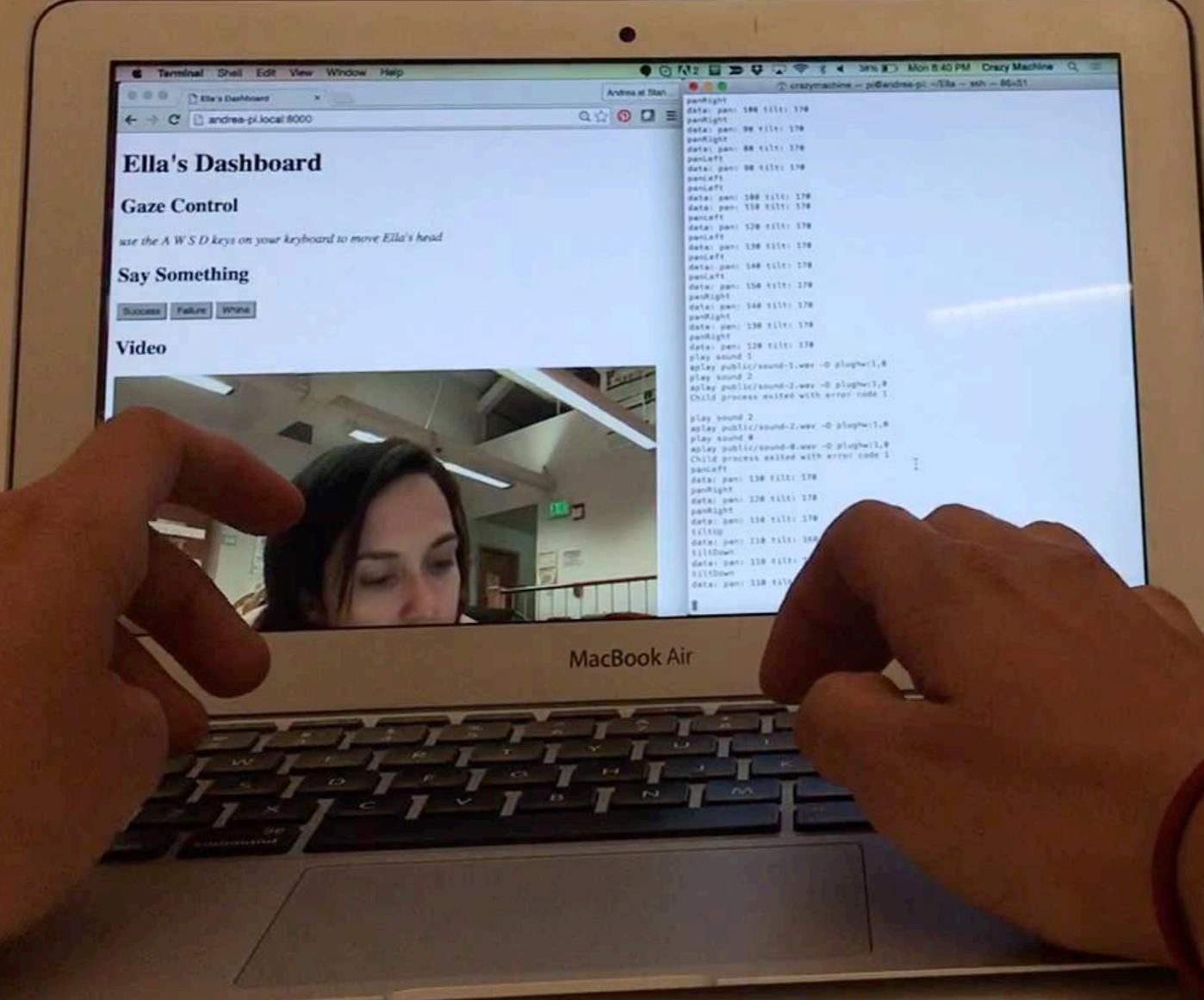
**Head orientation,  
mobility problems**







**Servos mechanically mounted (not tape), camera well-integrated**



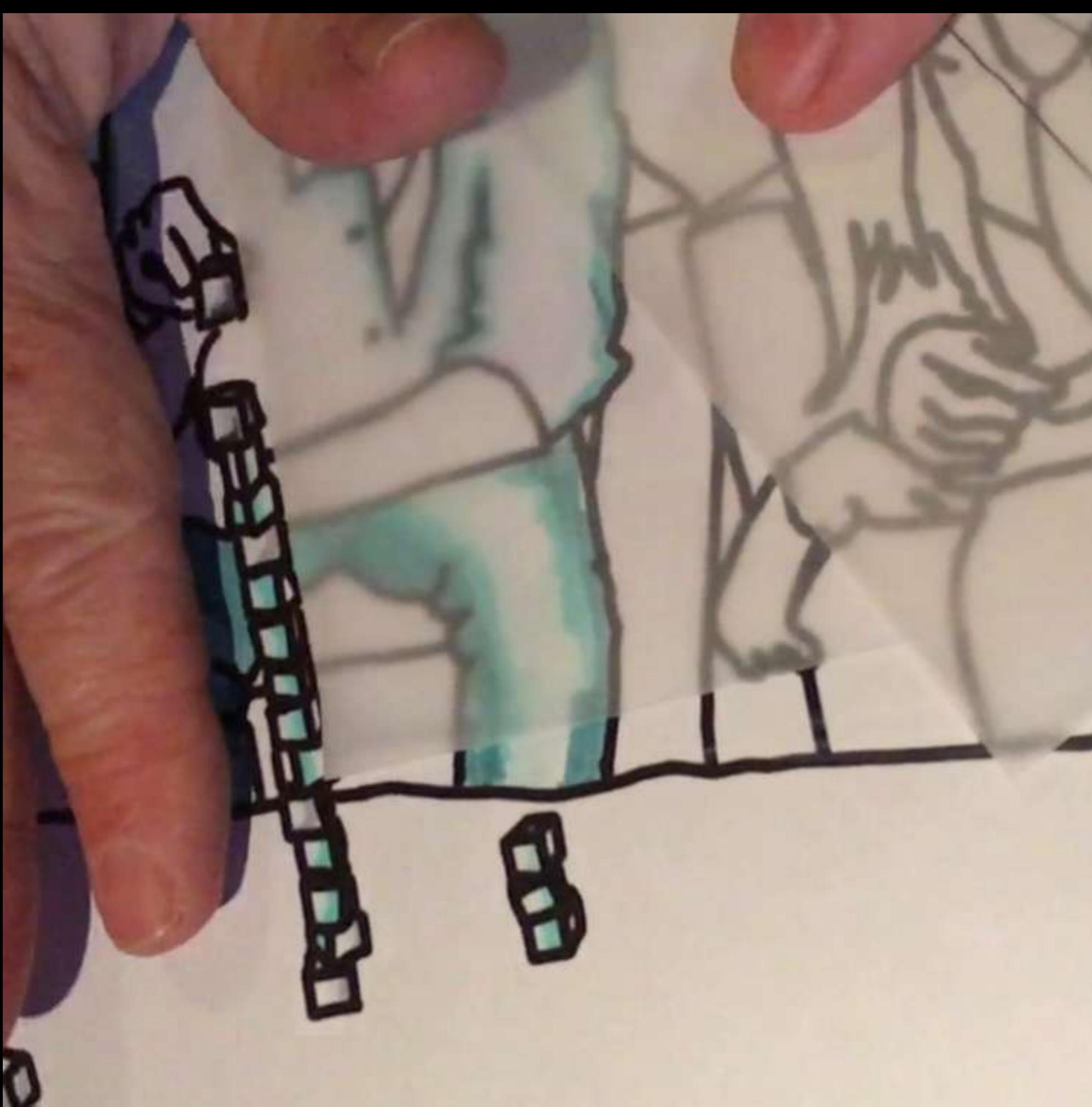
# Demo:

- Bending plastic

# Fancy Cubes

sonal  
lement

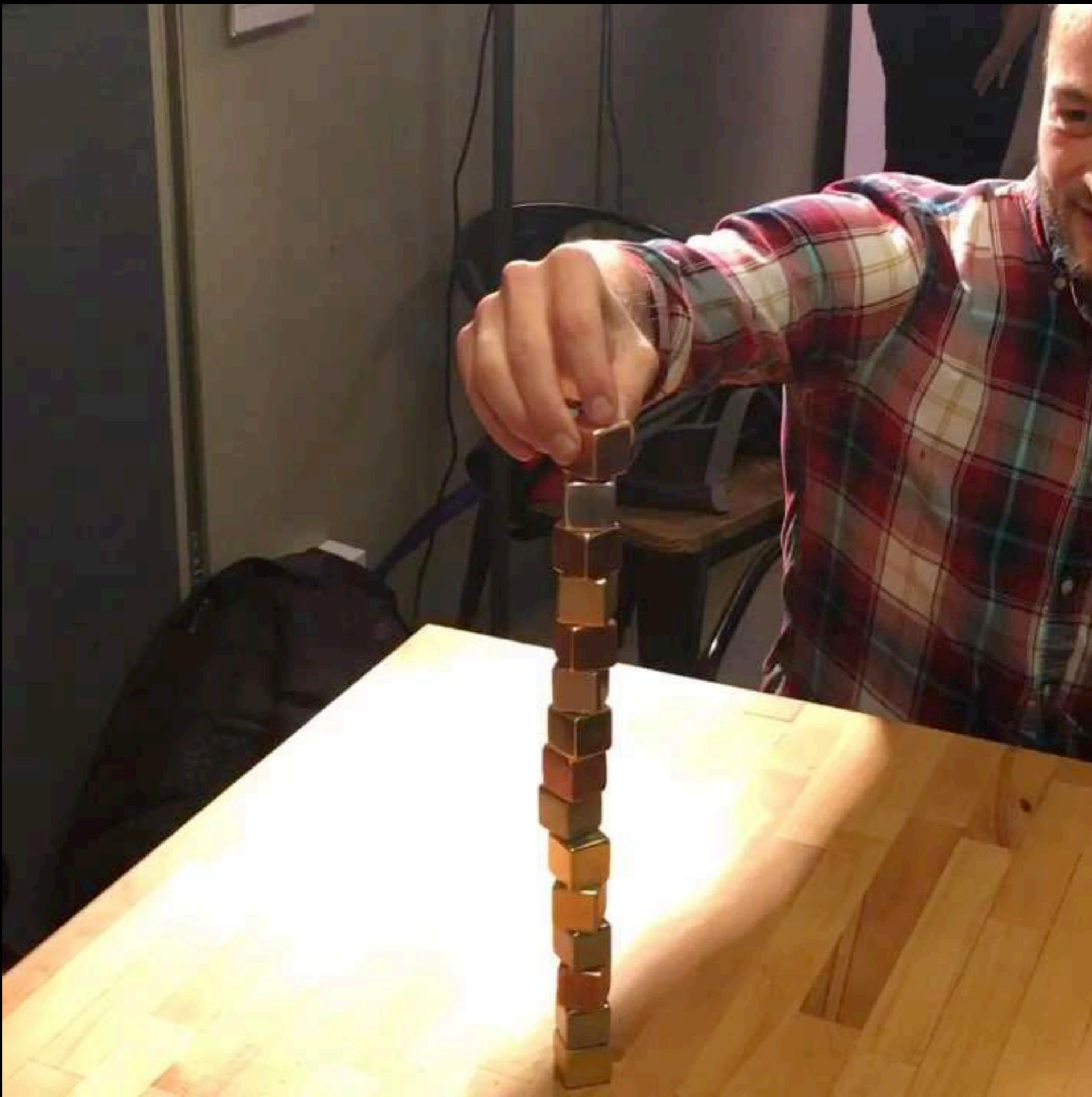












1.  
on your packing list

Line



U.S.A.

STAINLESS STEEL

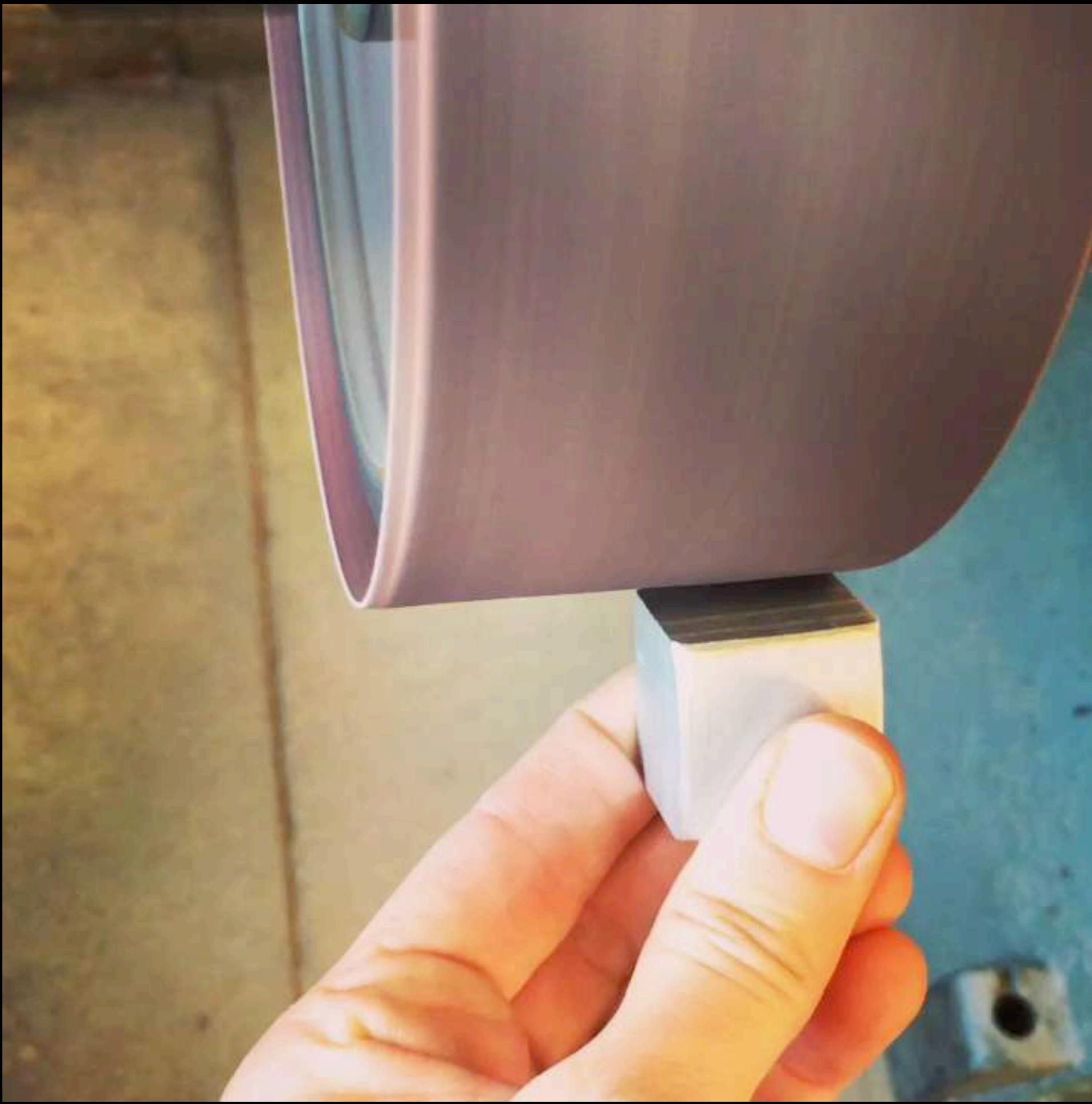
30 29 28 27 26 25 24 23 22 21 20 19 18

WESTCOT



**Steel**





















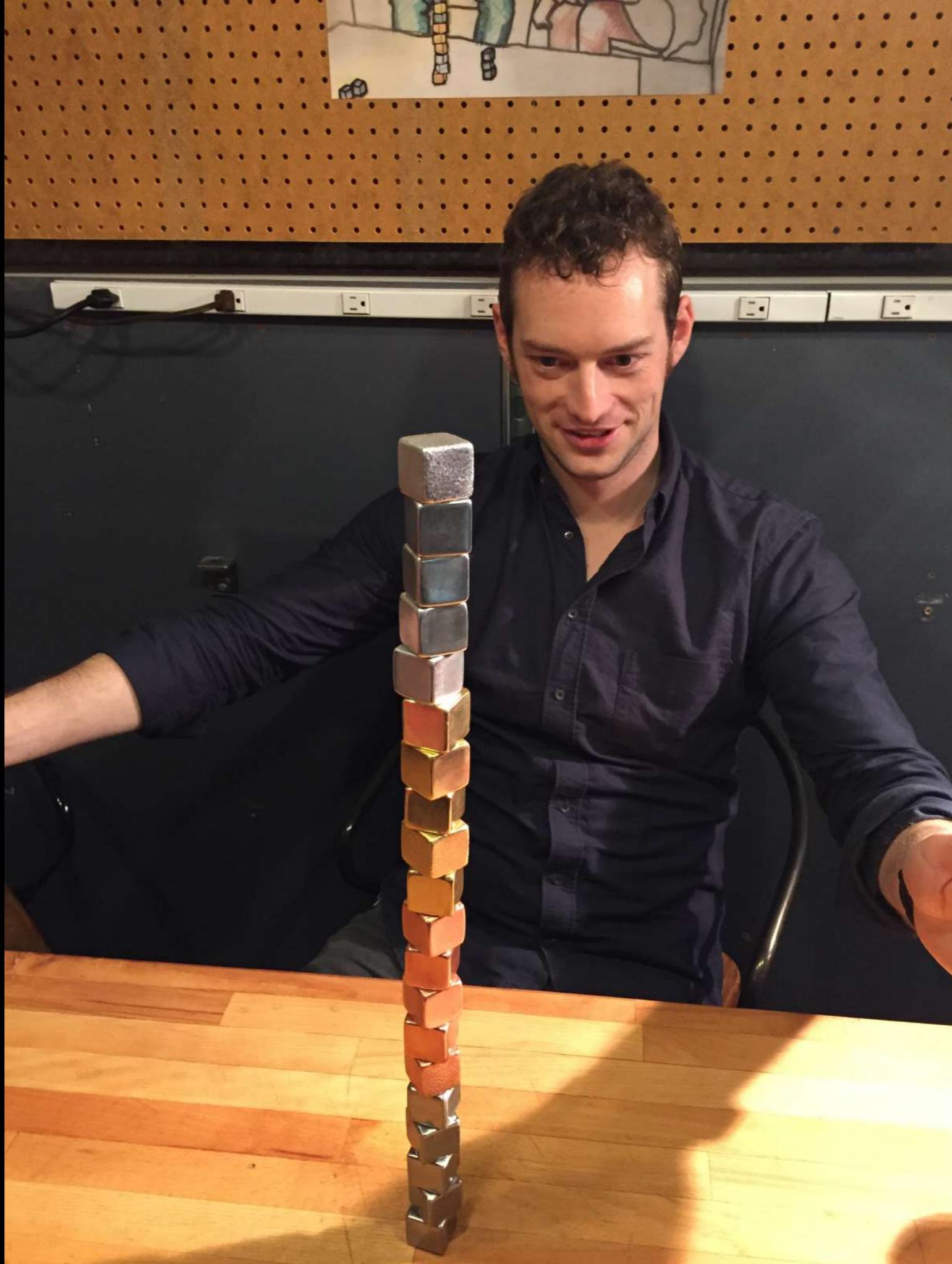












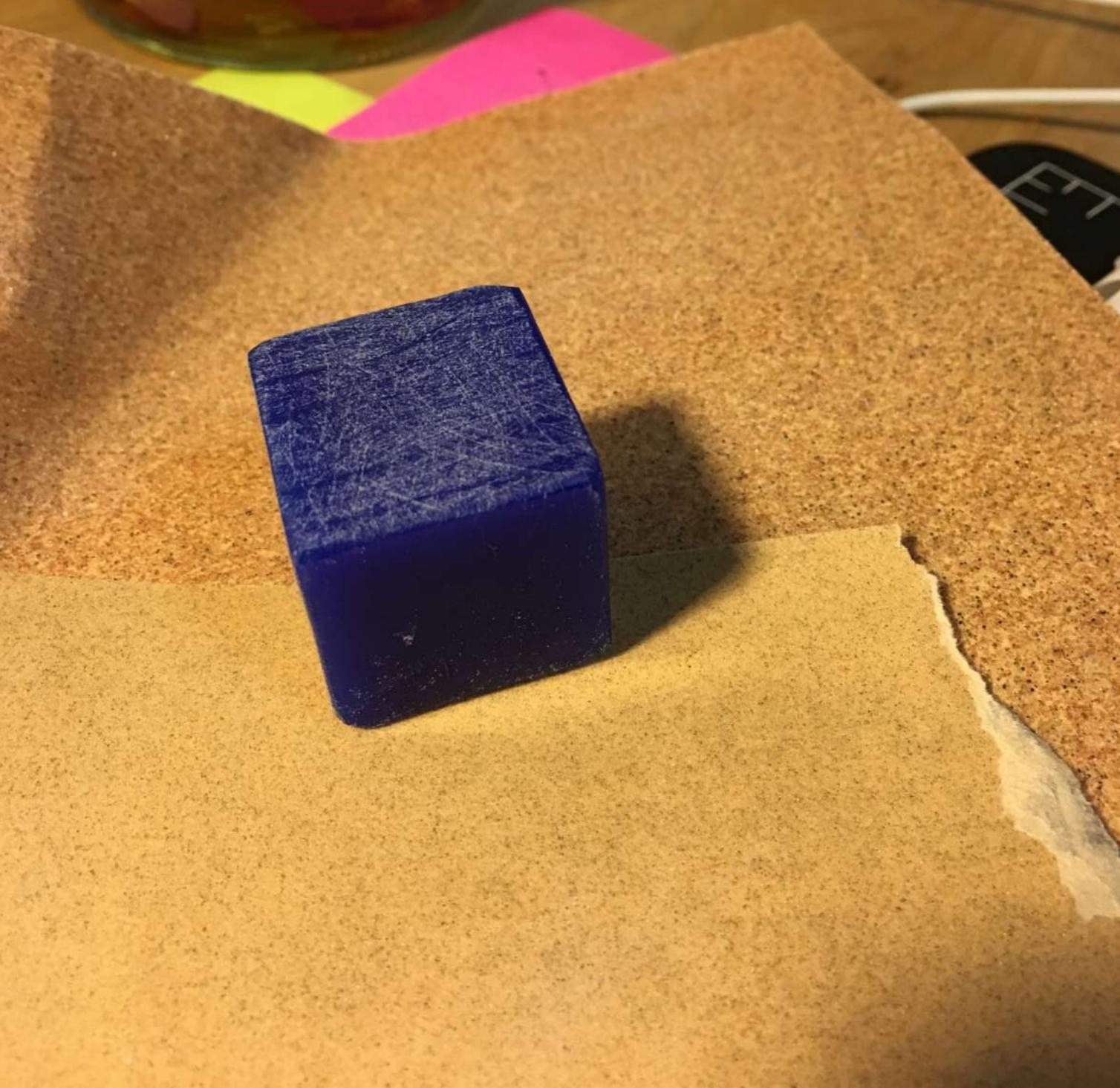
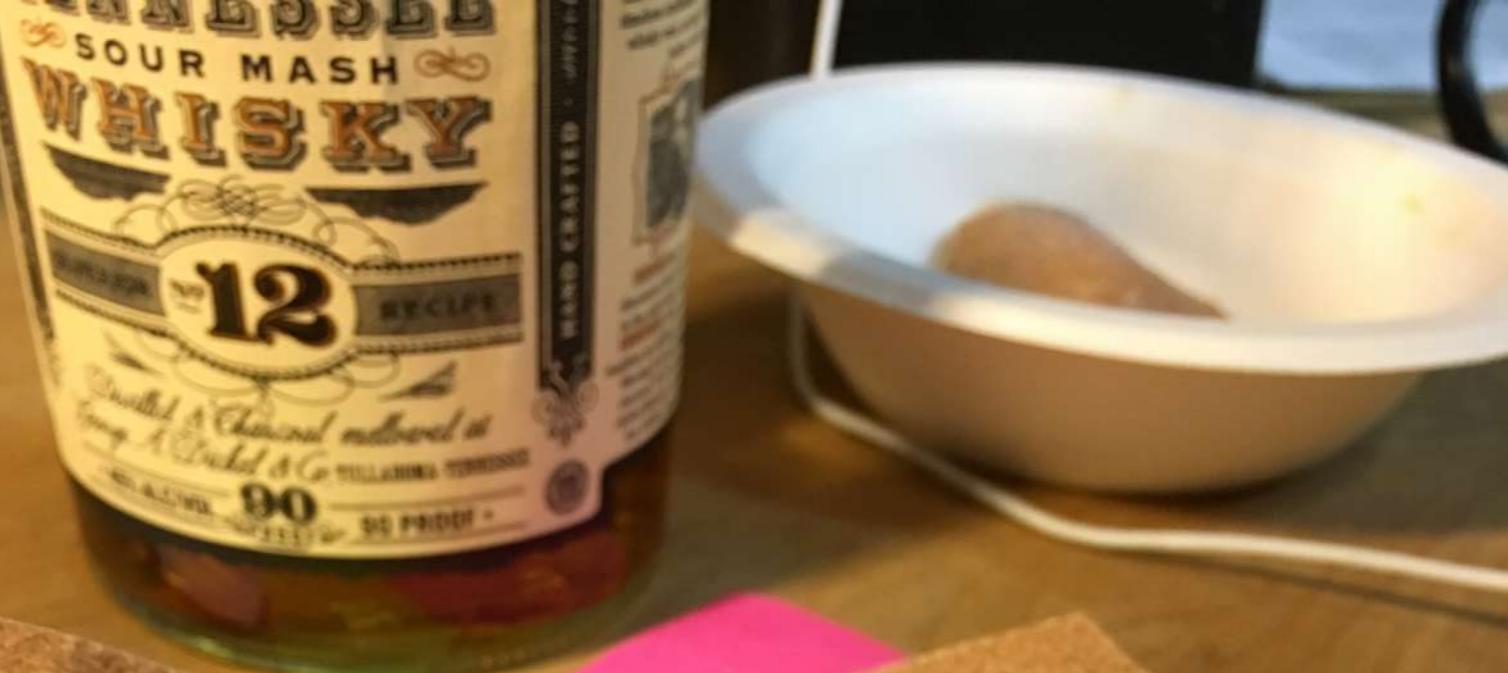




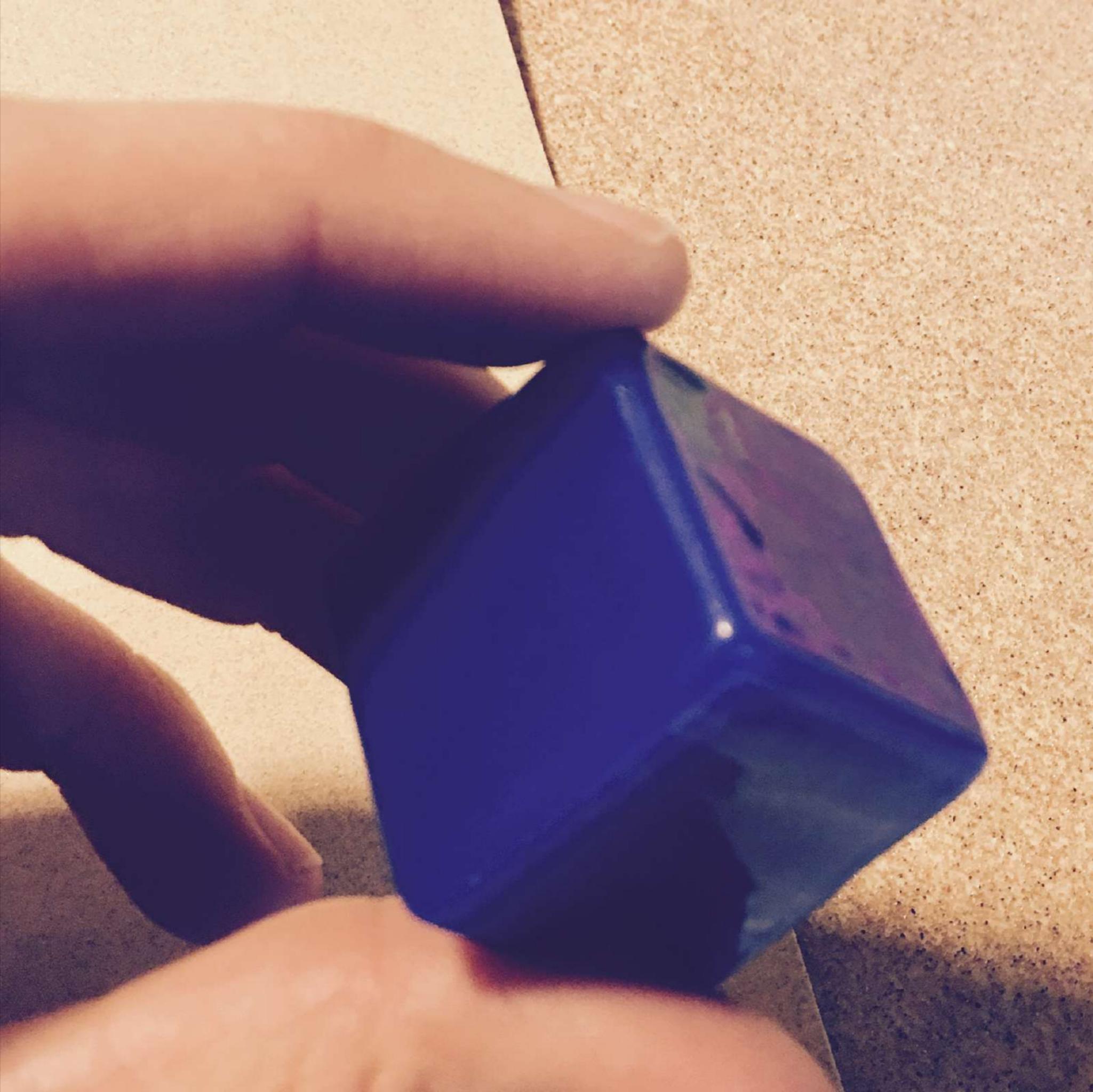


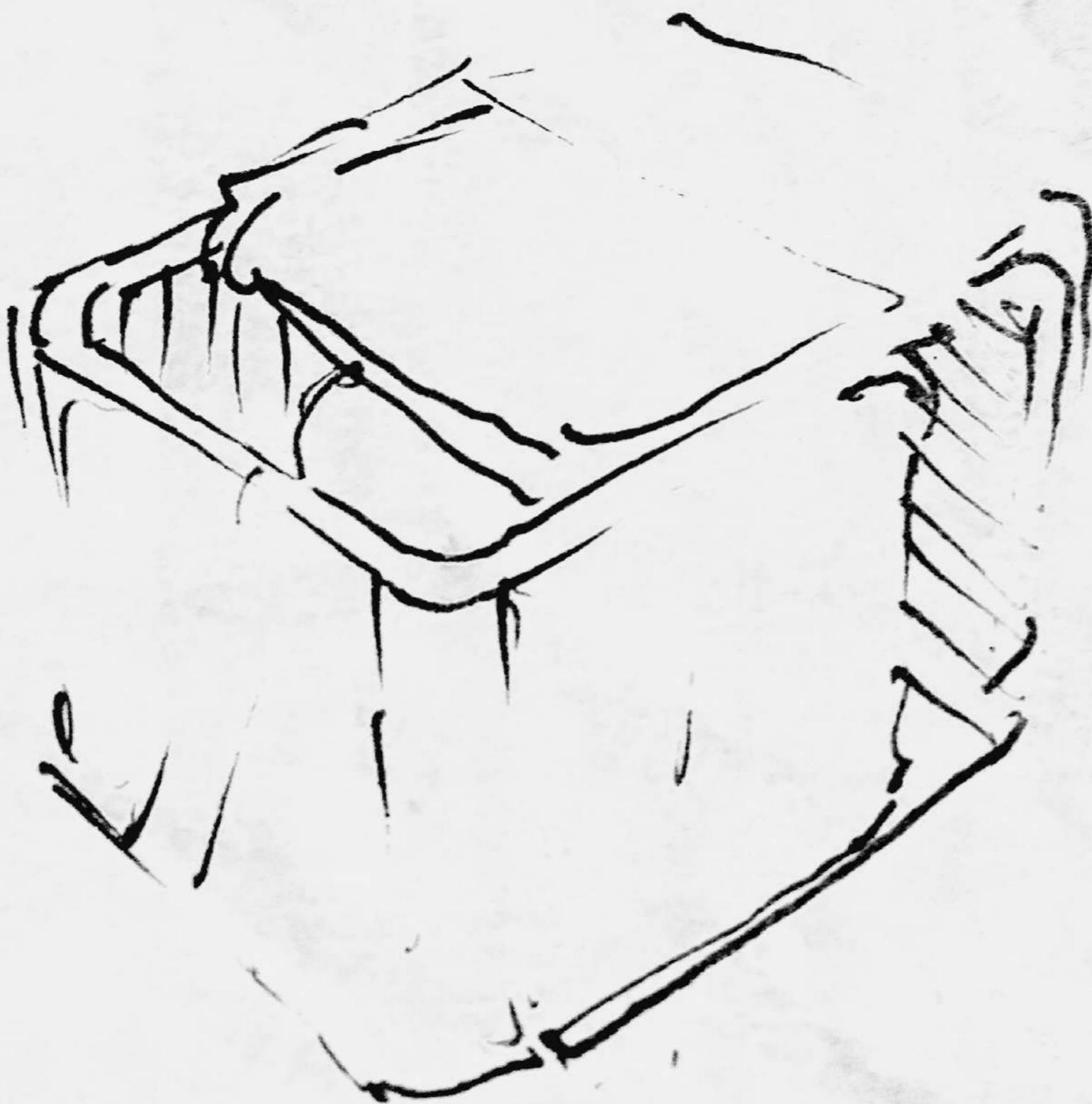


Preliminary material exploration



















Sanded (220)

Shellac

Rubbed  
Waxed

Rubbed  
Waxed

Boiled Linseed Oil

Polyurethane Varnish

Rubbed  
Waxed

Rubbed  
Waxed

Sanded (220)

Boiled Linseed Oil

Shellac

Polyurethane Varnish

Rubbed | Waxed

Rubbed | Waxed

Rubbed | Waxed

Rubbed | Waxed

Sanded (220)

Boiled Linseed Oil

Shellac

Polyurethane Varnish

Rubbed | Waxed

Rubbed | Waxed

Rubbed | Waxed

Rubbed | Waxed

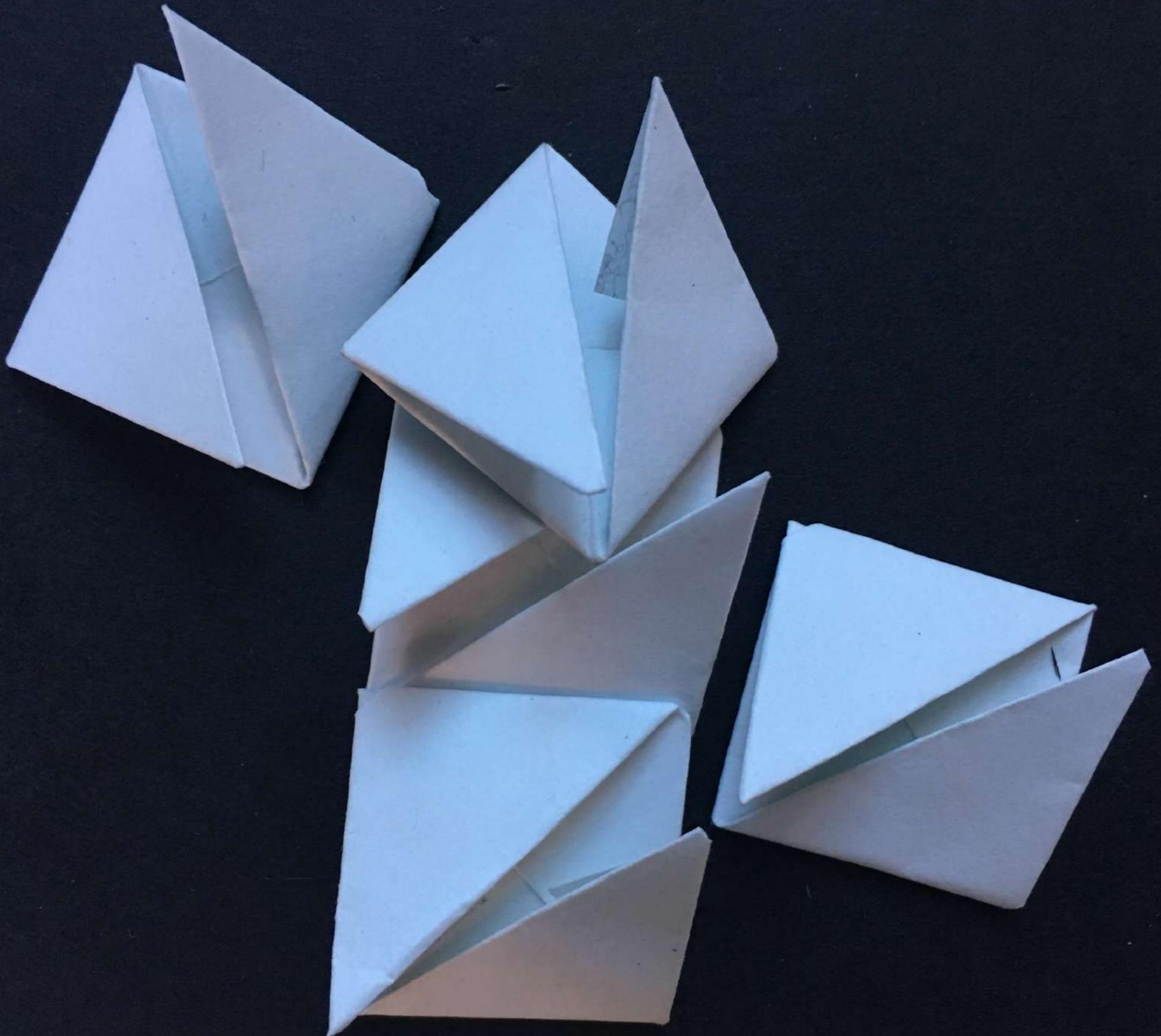
No G



**Polished**



**Raw**







**White  
Delrin**

**Black  
Delrin**

**Wood**

**Brass**

**Copper**

**Aluminum**

**Acrylic**

**Paper**

**Wax**

Andrea Cuadra placed this order.

| Line | Product   | Ordered   | Shipped | Balance | Price         | Total |
|------|---|-----------|---------|---------|---------------|-------|
| 1    | 89275K38 Multipurpose 110 Copper Rectangular Bar, 1" x 1", 1/2' Long                | 1<br>Each | 1       | 0       | 23.24<br>Each | 23.24 |
| 2    | 8951K51 Ultra-Machinable 360 Brass Rectangular Bar, 1" x 1", 1/2' Long              | 1<br>Each | 1       | 0       | 25.23<br>Each | 25.23 |
| 3    | 8739K92 White Delrin Acetal Resin Rectangular Bar 1" Thick X 1" Width, 1 ft. Length | 1<br>Each | 1       | 0       | 11.47<br>Each | 11.47 |
| 4    | 8662K61 Black Delrin Acetal Resin Rectangular Bar 1" Thick, 1" Wide, 1 ft. Length   | 1<br>Each | 1       | 0       | 12.64<br>Each | 12.64 |
| 5    | 9008K14 Multipurpose 6061 Aluminum Rectangular Bar, 1" x 1", 1/2' Long              | 1<br>Each | 1       | 0       | 4.03<br>Each  | 4.03  |
| 6    | 8680K26 Optically Clear Cast Acrylic Cube 1" Square                                 | 3<br>Each | 3       | 0       | 4.20<br>Each  | 12.60 |