

Design, Making, Fabrication

Three case studies by Andrea Cuadra

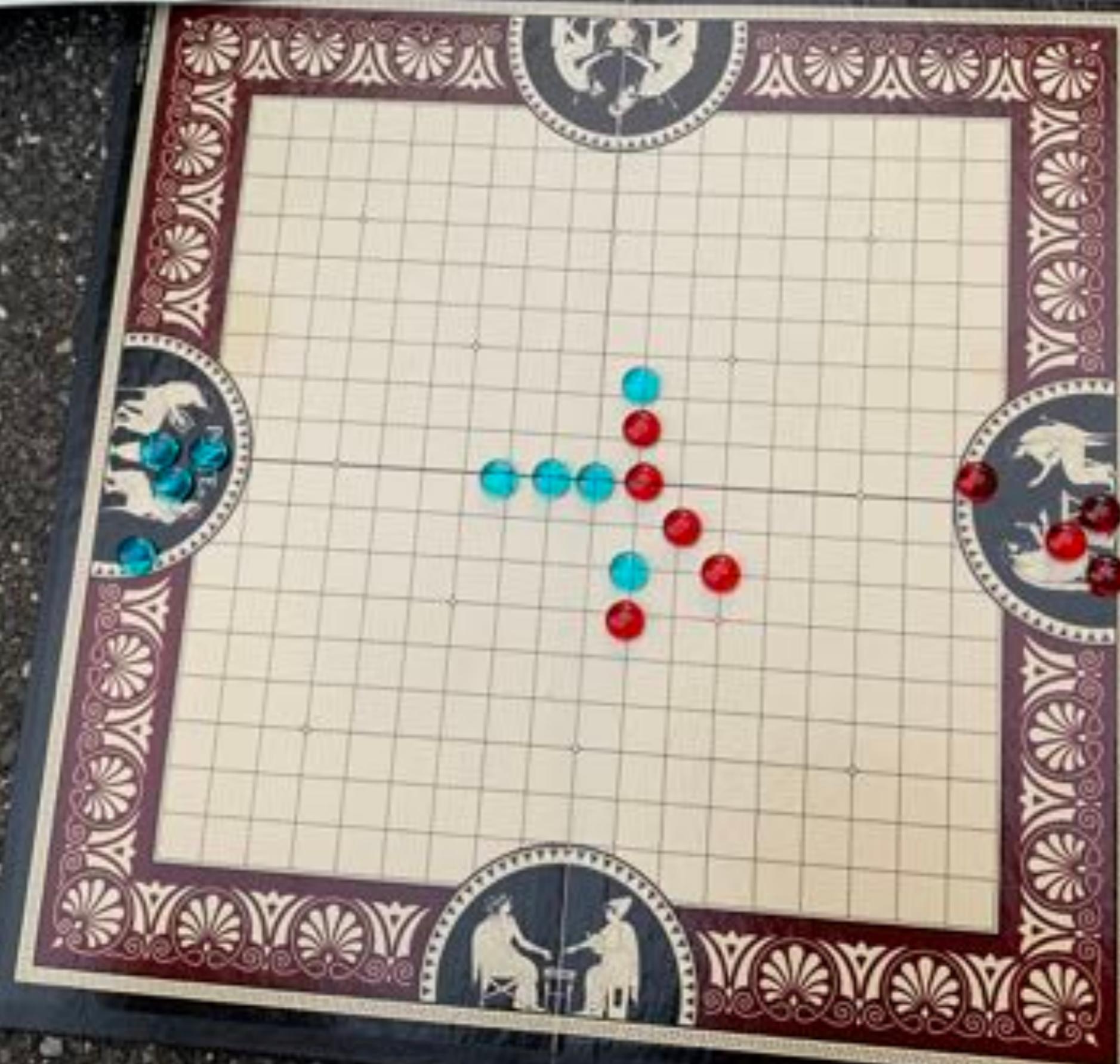
Case Study 1: Reimagining an old game

PENTE



The classic test of skill for ages 8 to adult
A two player or partner board game
Easy to learn - Hard to master

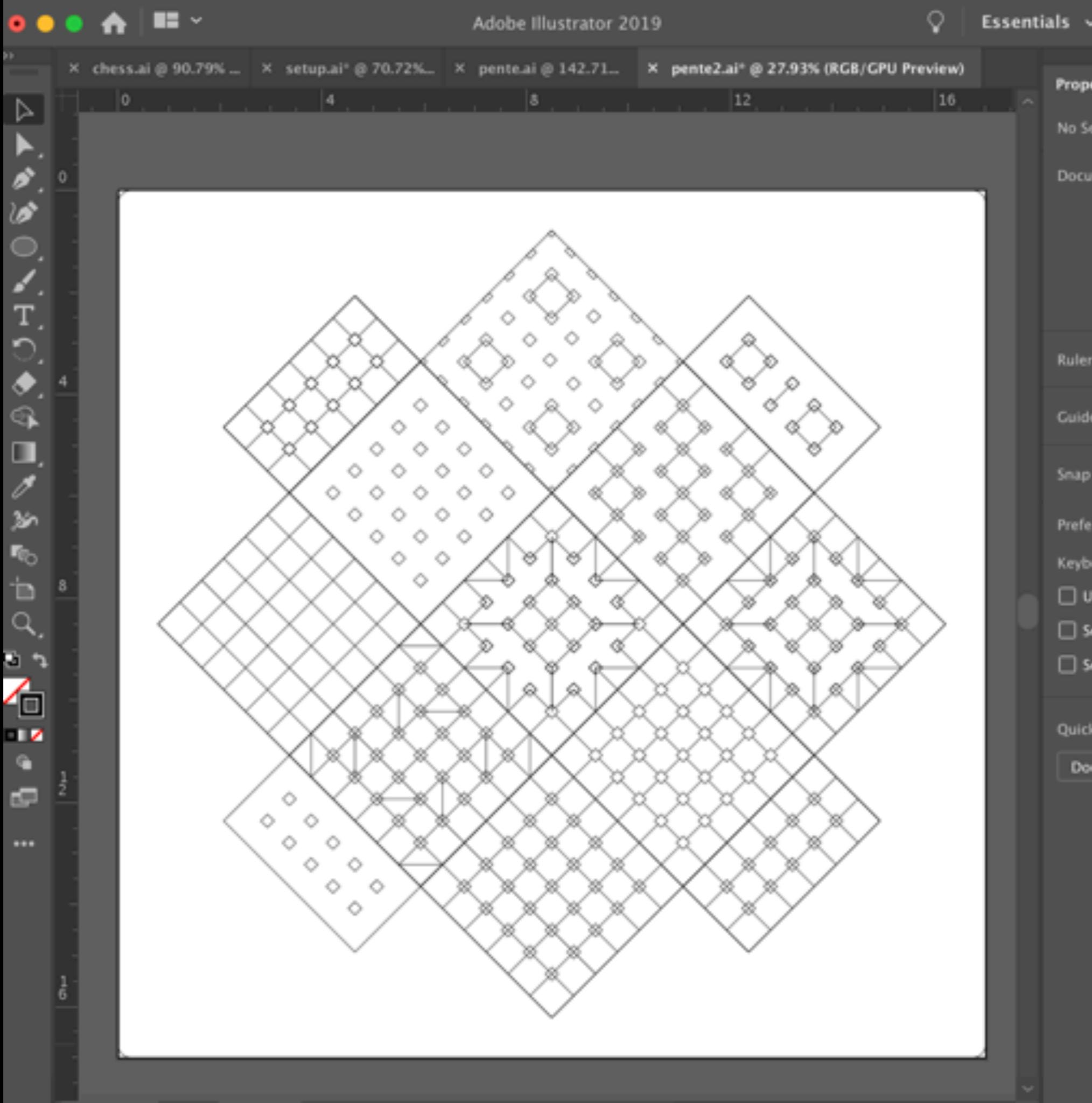
P E N T E



D E N T E

**Take inspiration from
what you love**

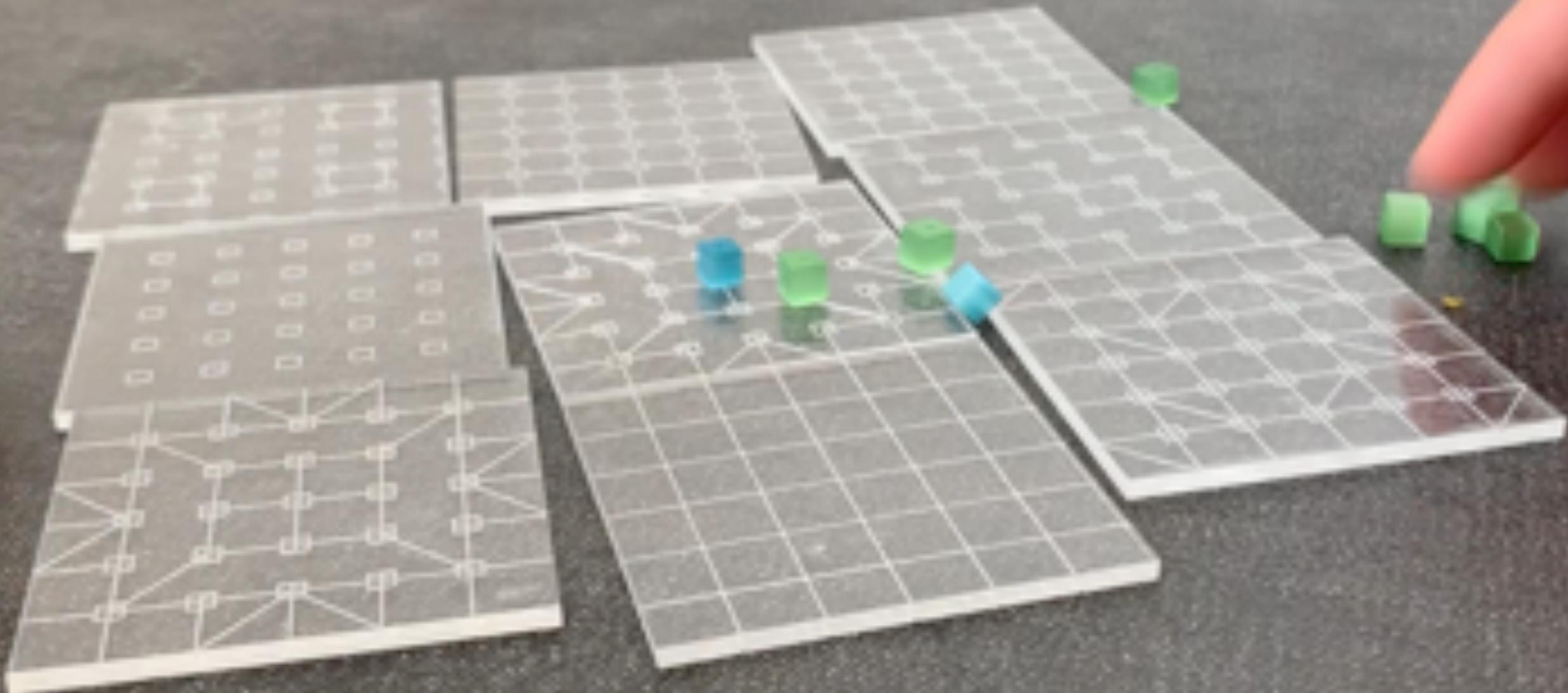
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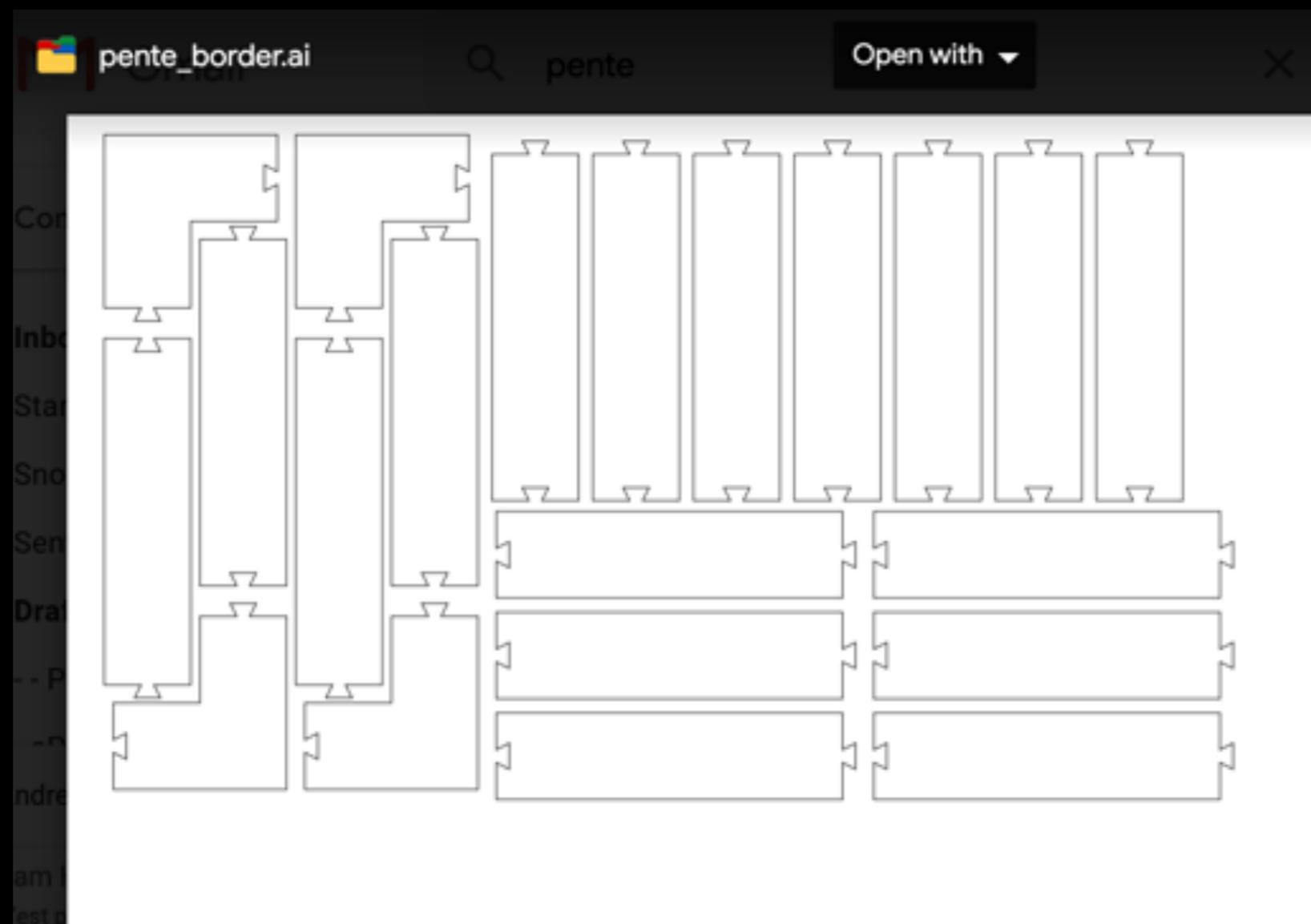
Get started right away with what you know

In this case, for me, it was Illustrator,
squares, and laser-cutting



User test early

Show your idea around, have people interact with it—to address problems before investing too much time, effort, and/or \$\$\$ into an idea.









Start ASAP ...

Plan for unanticipated challenges, as solutions come with problems of their own... :)

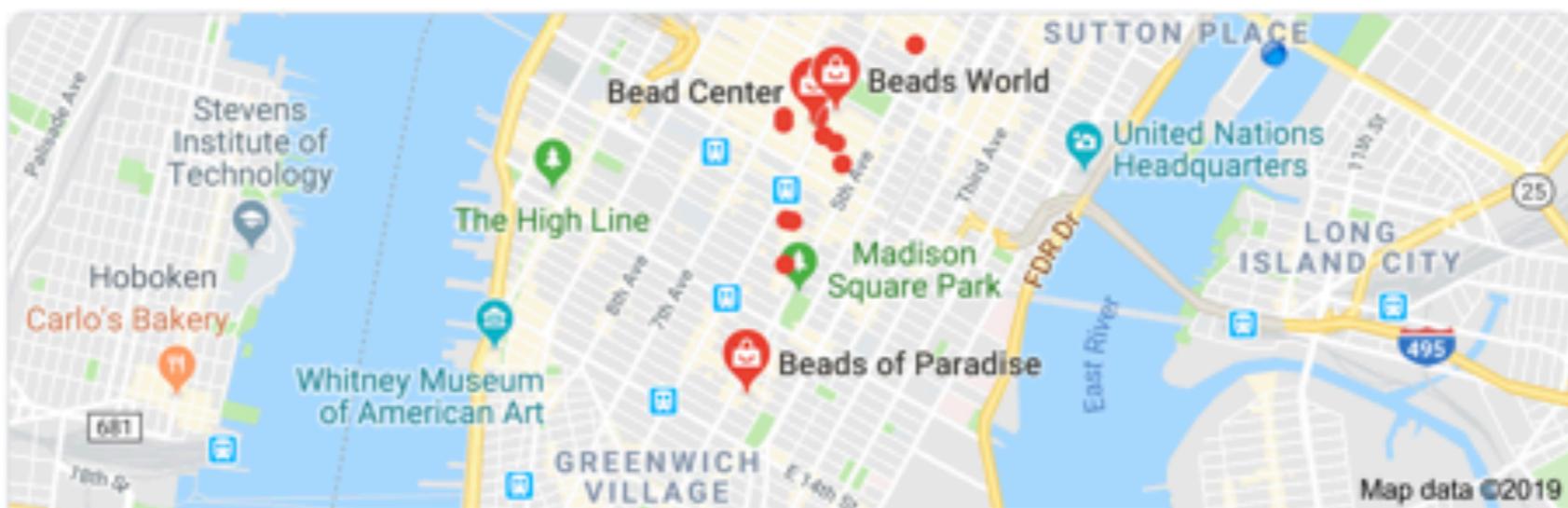




**Take inspiration from
what you love**

<3

bead stores nyc

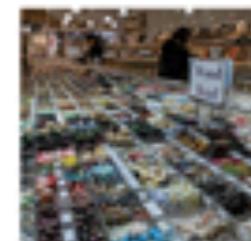


Rating ▾ Hours ▾ Your past visits ▾

Sort by ▾

Beads World

4.0 ★★★★☆ (153) · Bead store
1.6 mi · 57 W 38th St · (212) 302-1199
Open · Closes 7PM
Expansive option for beads & trimmings



Bead Center

4.1 ★★★★☆ (119) · Bead store
1.7 mi · 989 6th Ave · (212) 279-2323
Open · Closes 7PM
Emporium for beads, clasps & string

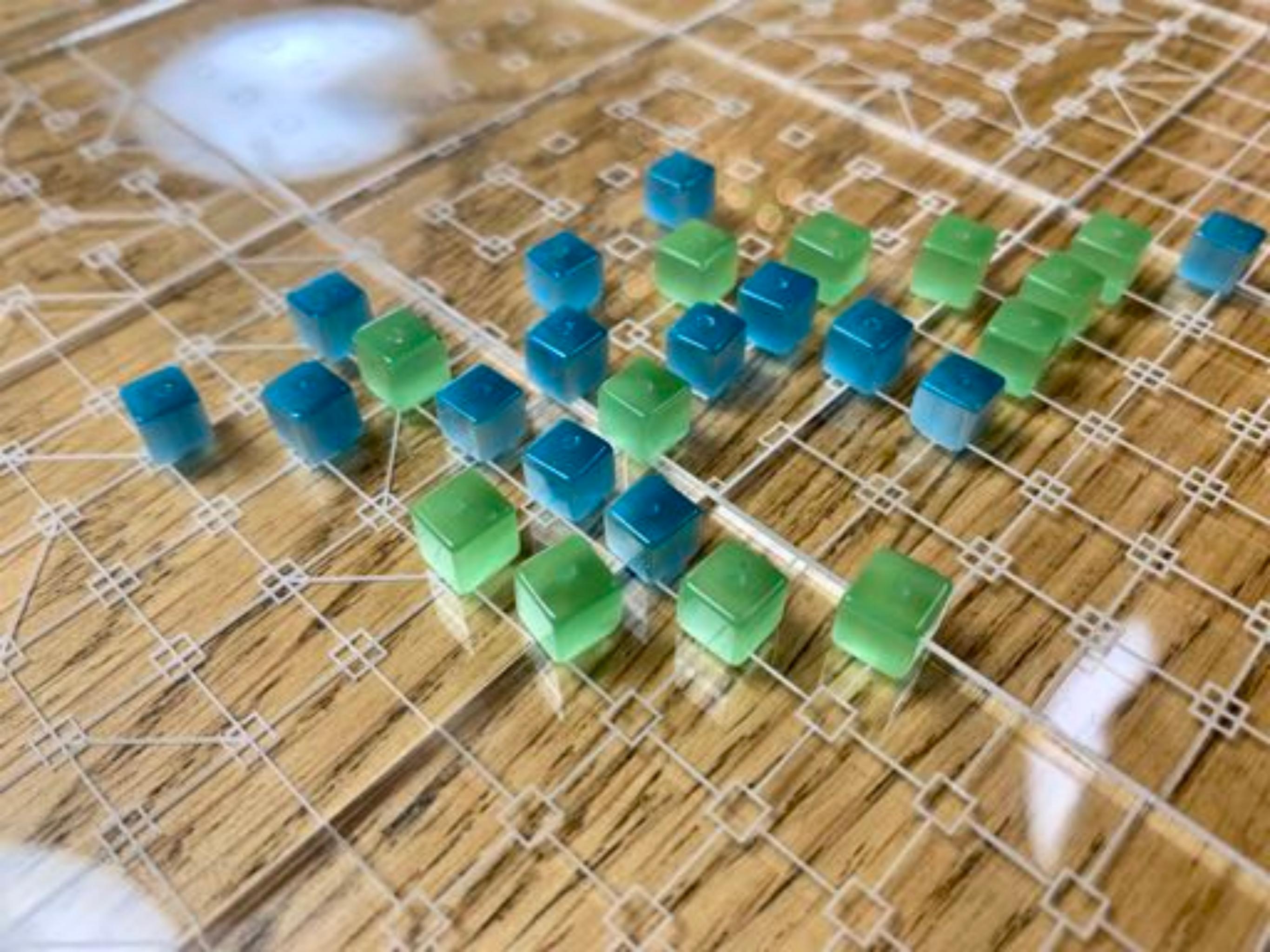


Beads of Paradise

4.6 ★★★★★ (126) · \$\$ · Bead store
2.3 mi · 16 E 17th St · (212) 620-0642
Open · Closes 7:30PM
Globally-focused jewelry & artifacts

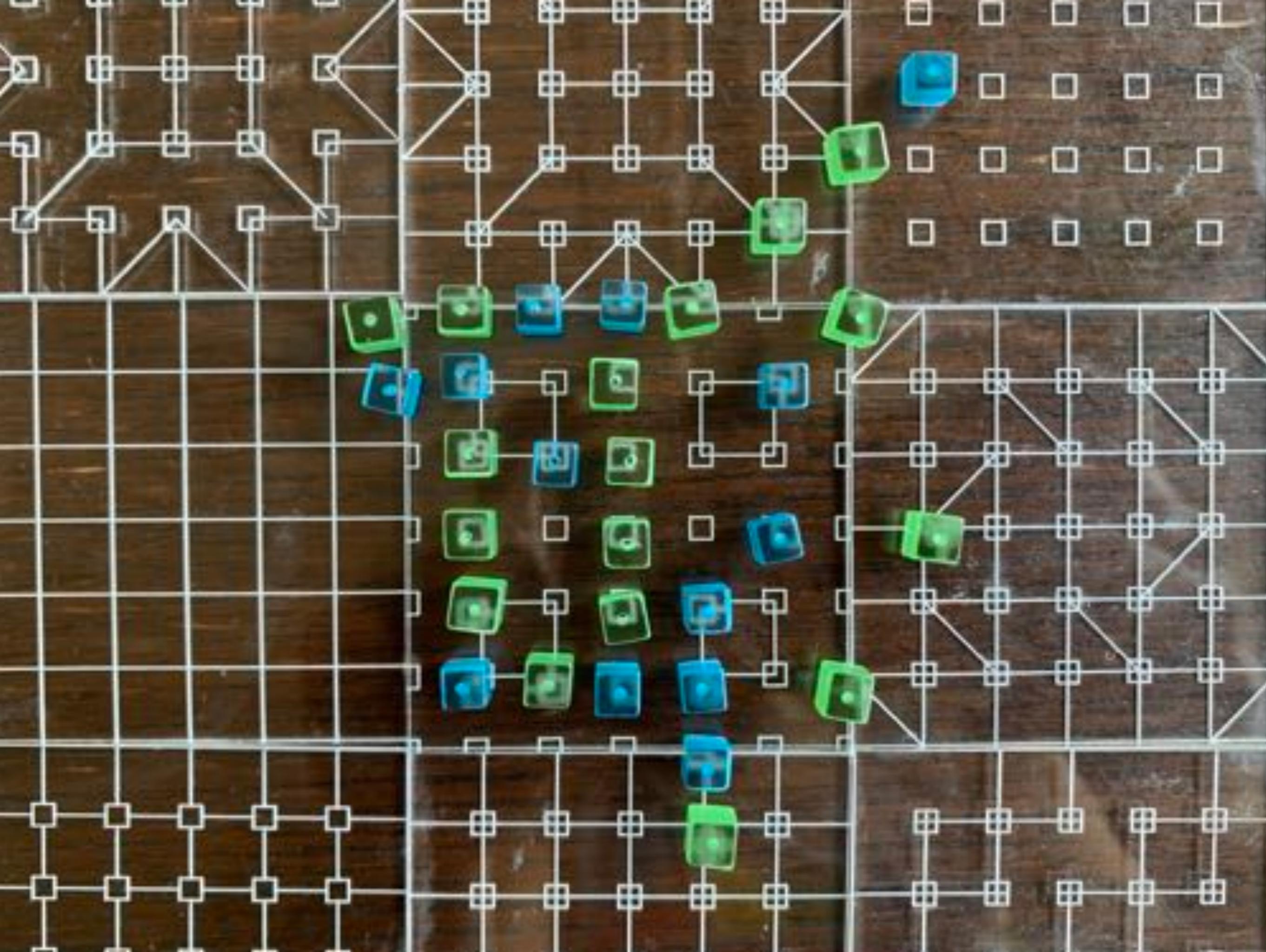








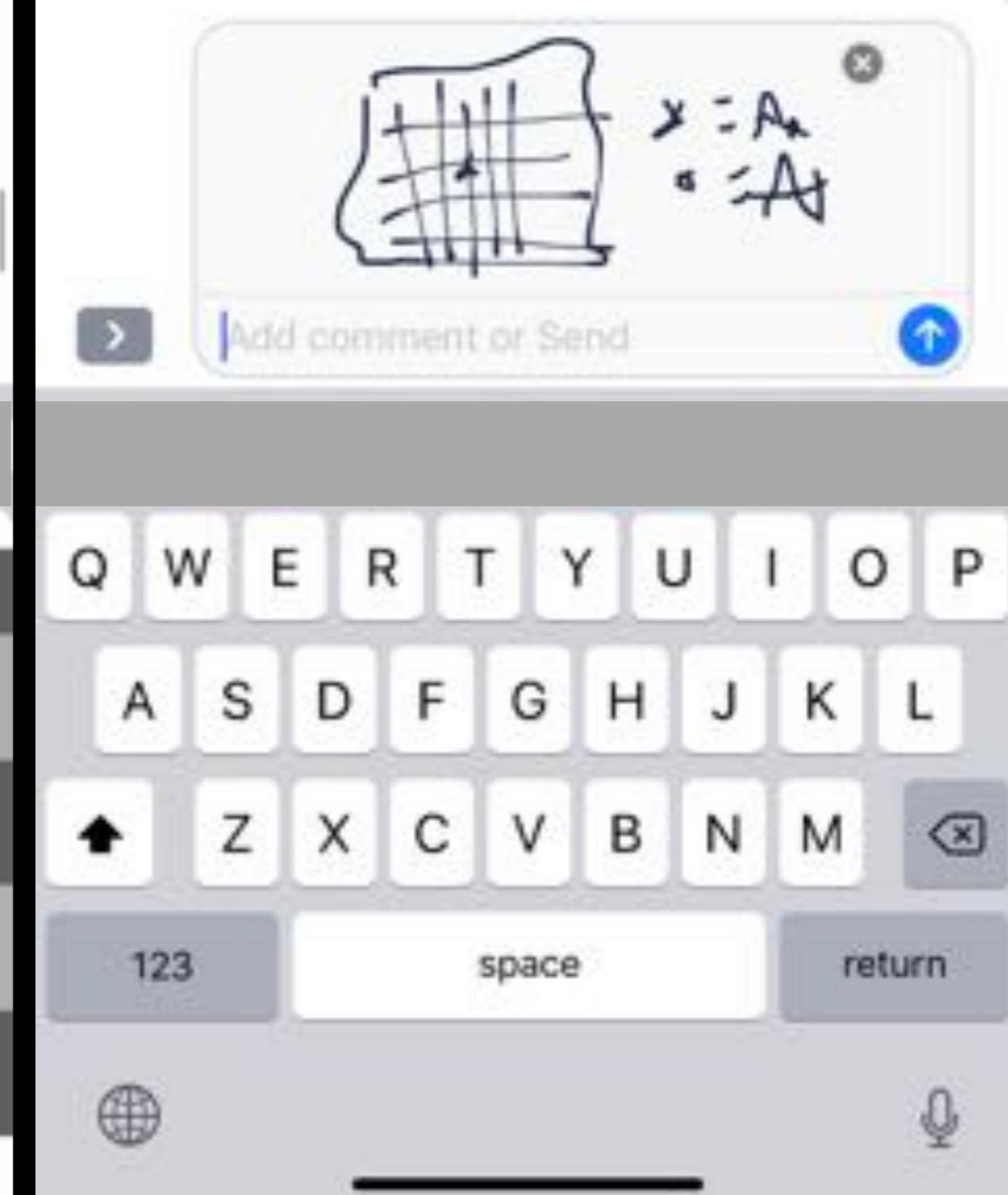
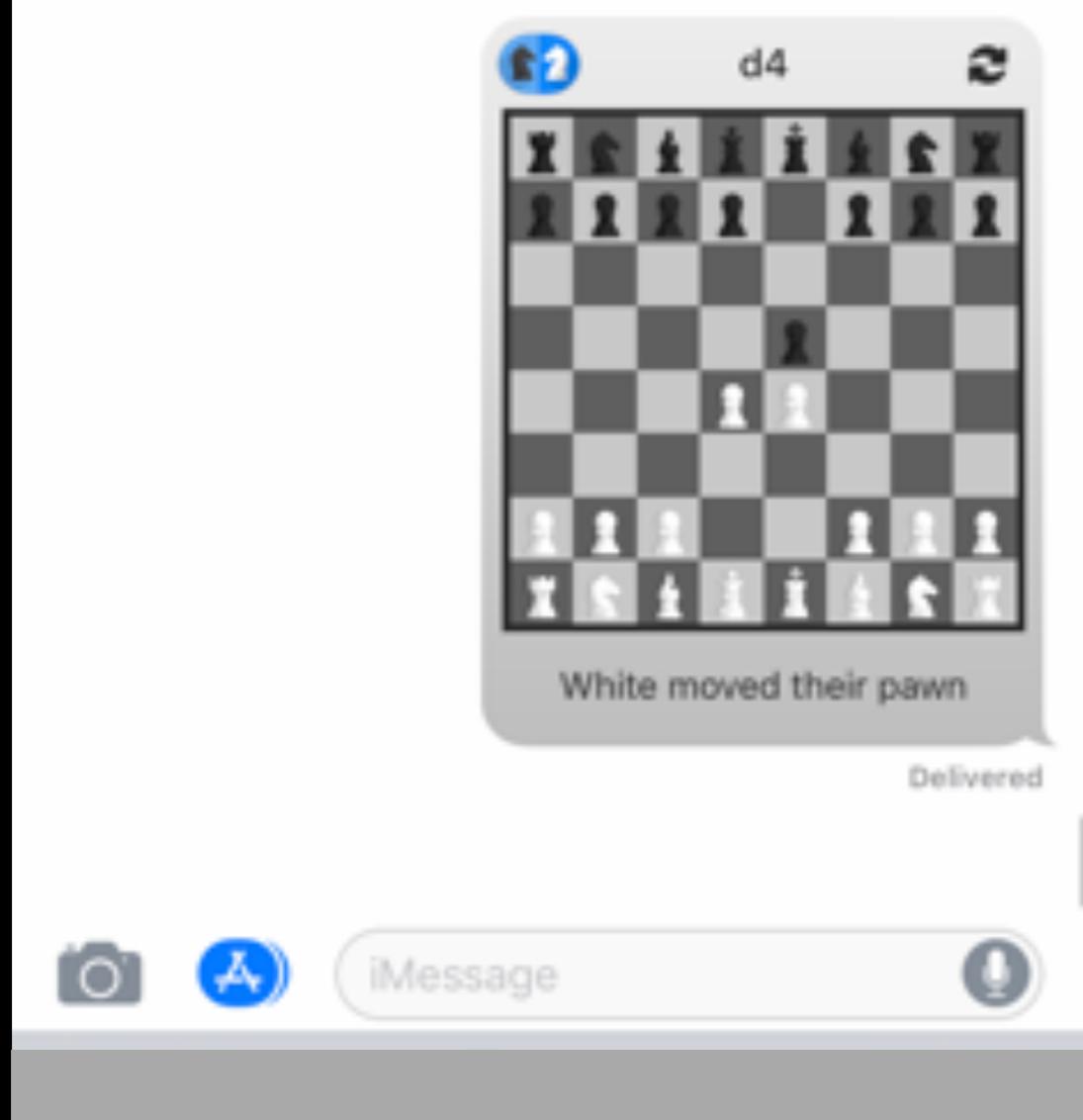
**We ended up liking the bead
aesthetic**



Keep an open-mind

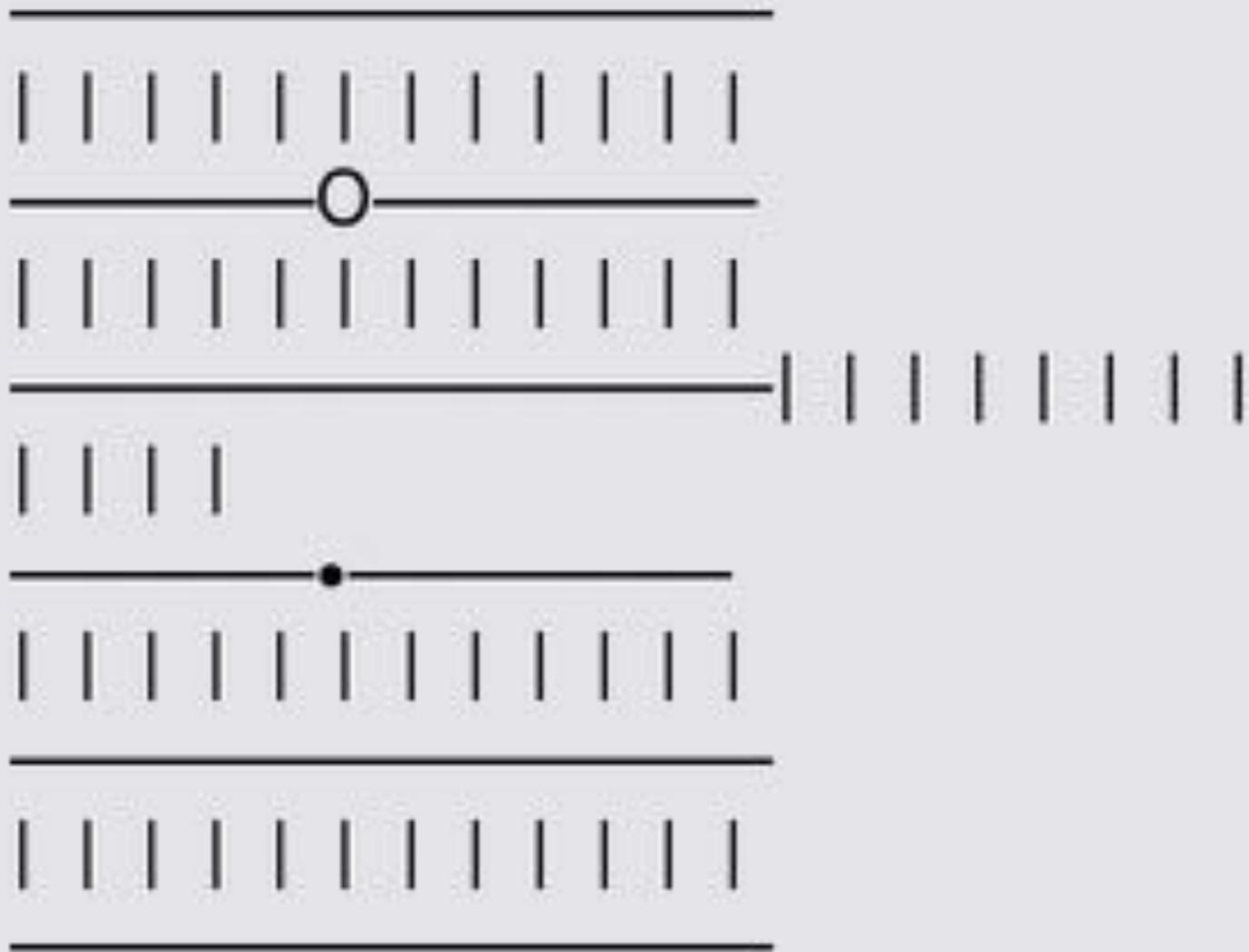
Sometimes things that seem like
you're "settling" for them end up
delighting you

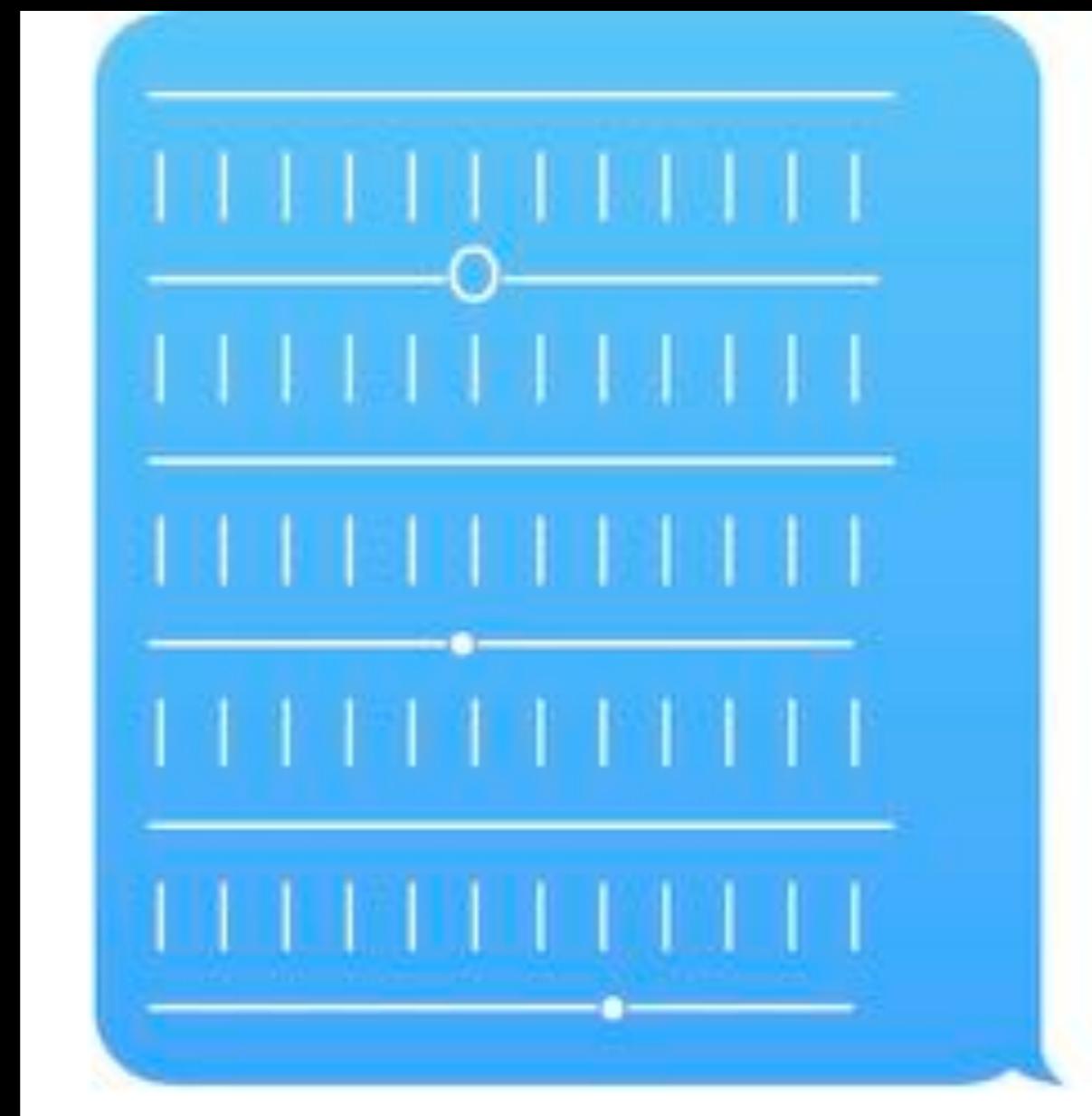
Today 3:26 PM

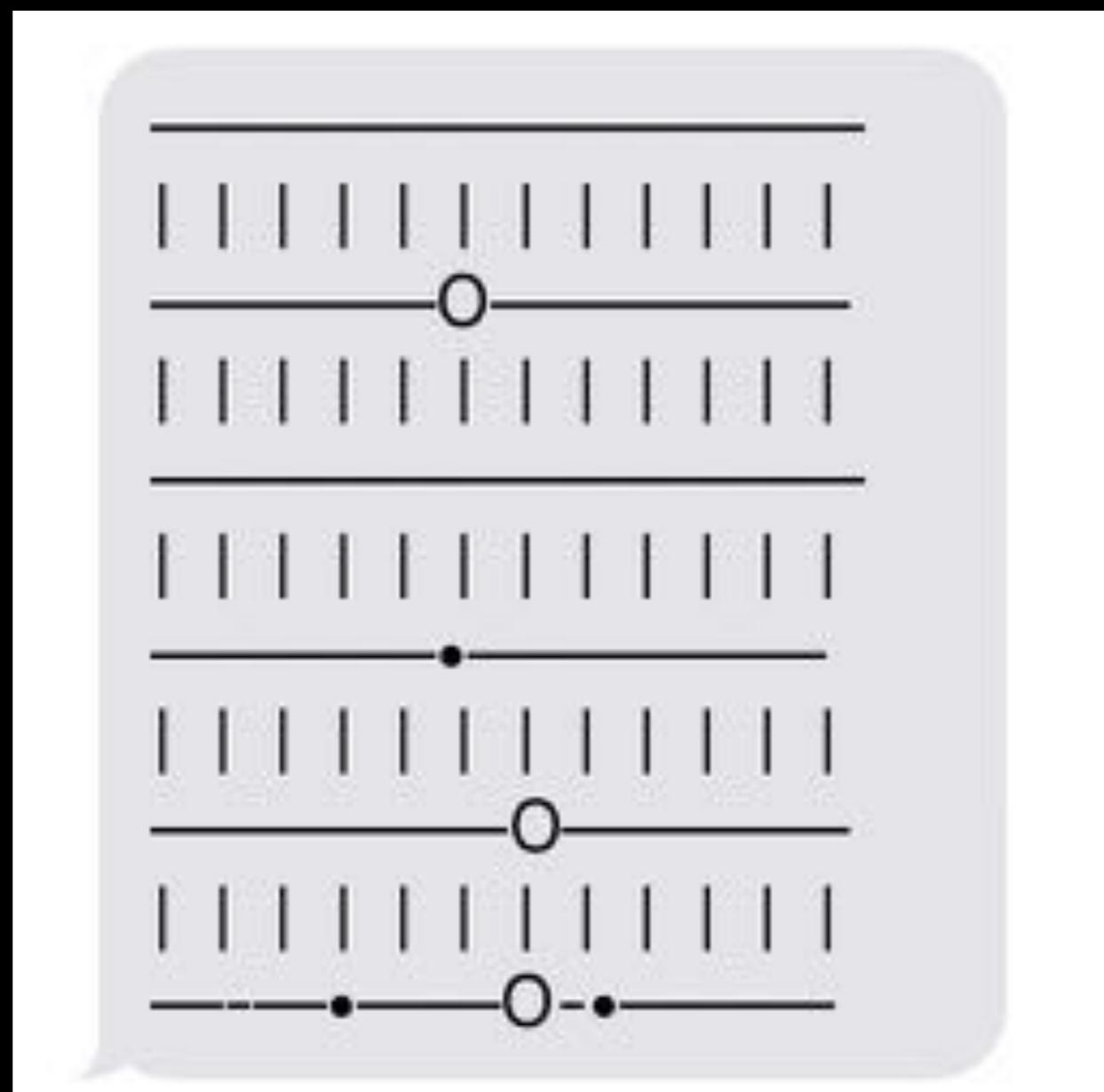


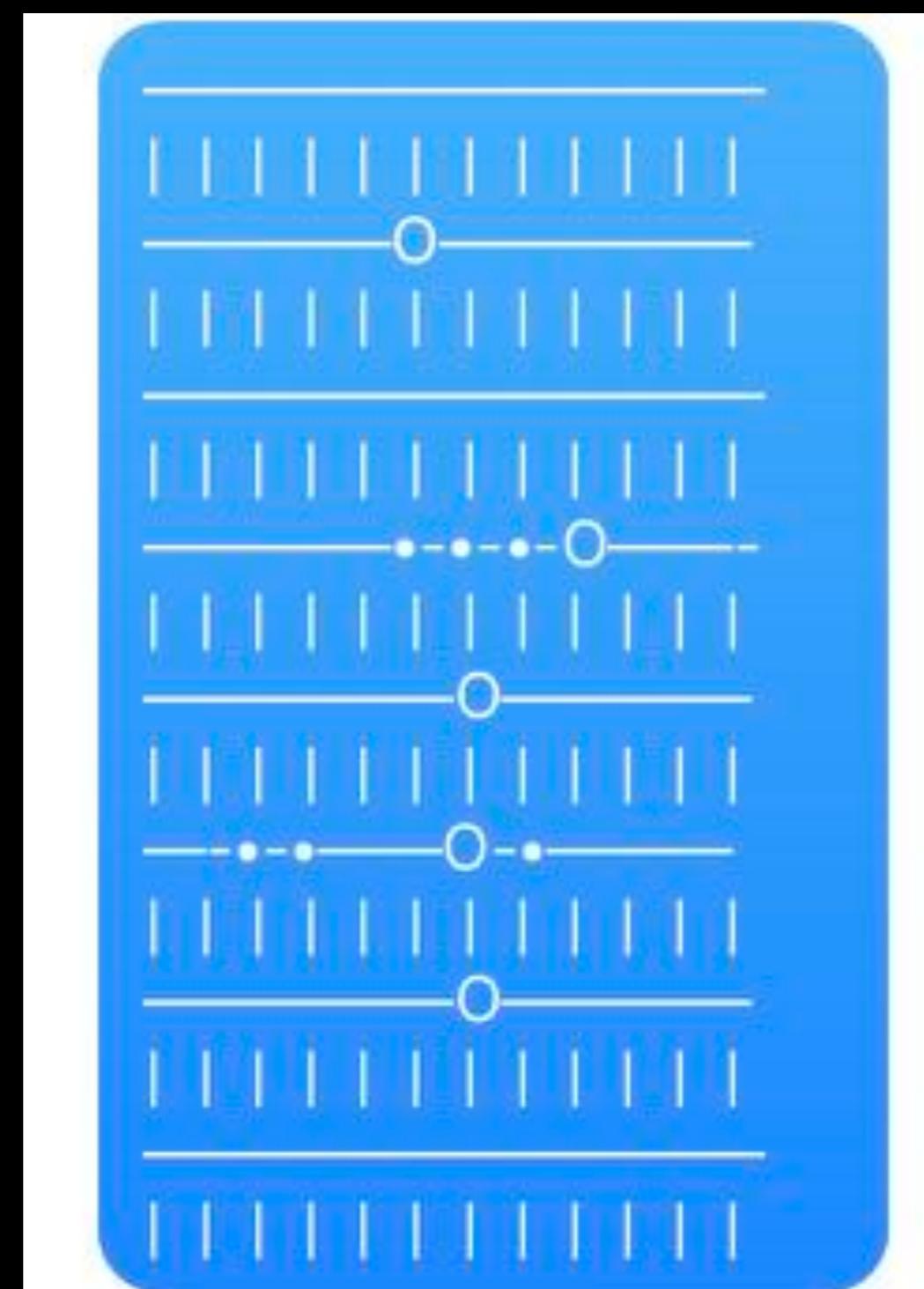


$$y = Ax$$
$$\sigma = \sqrt{A}$$



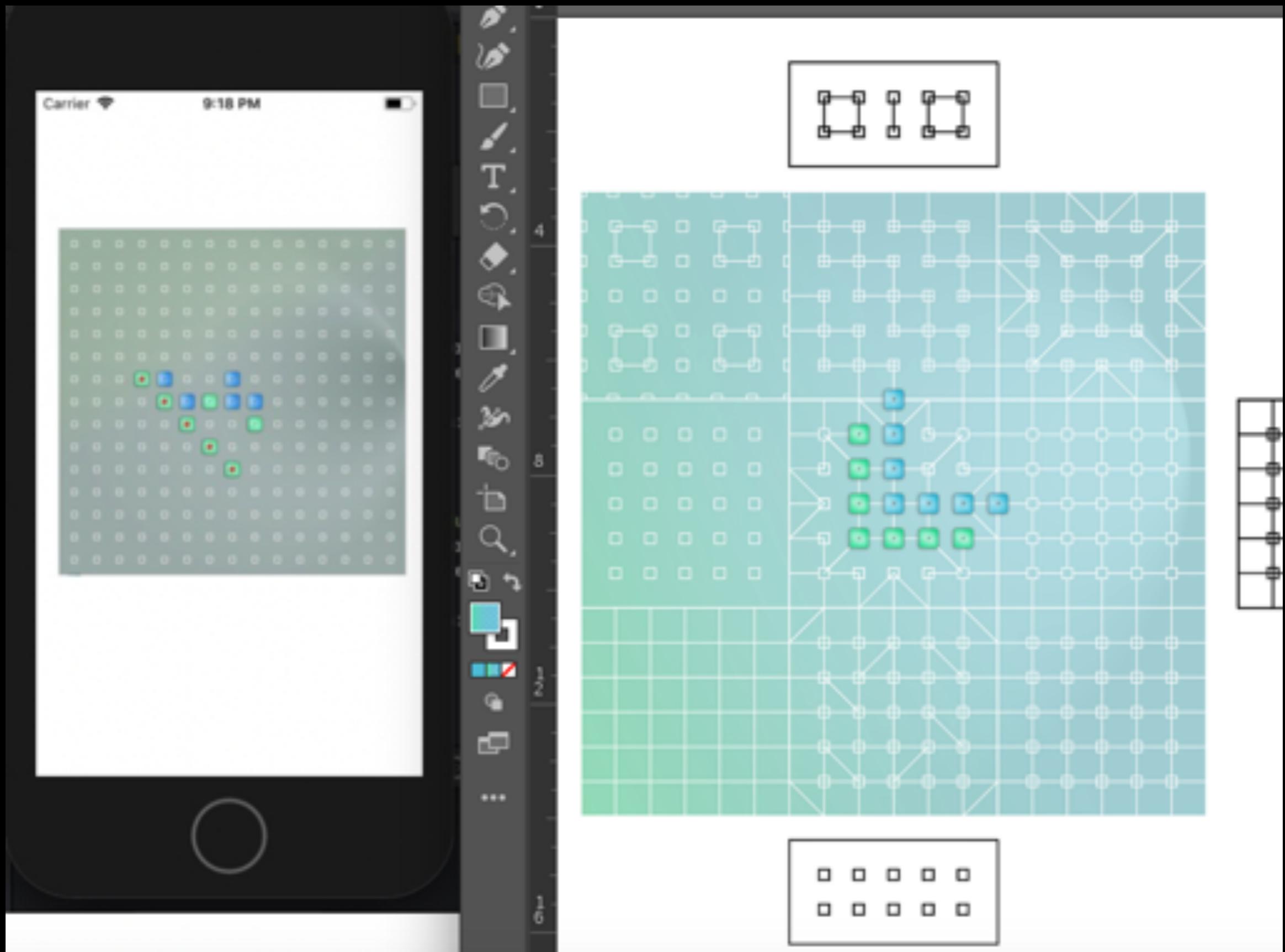






Prototype at all fidelities

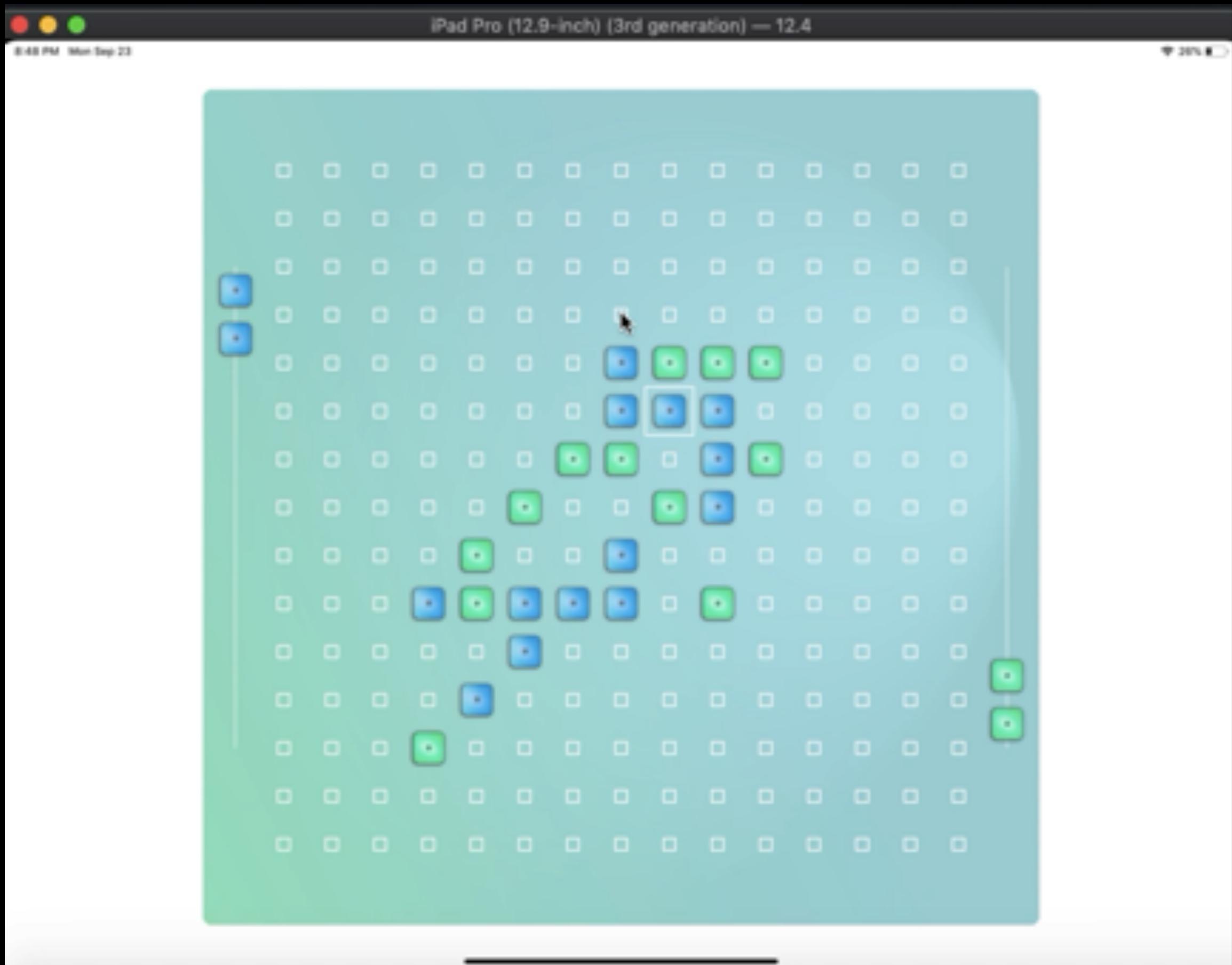
There are all sorts of prototypes for
the different parts and the different
stages of an idea





Explore many options before choosing for one

With so many methods, materials, and ideas available—this will help ensure you're choosing well!



Today 3:26 PM

t2

d4

z



White moved their pawn

Delivered



iMessage



t2

Checkmate!

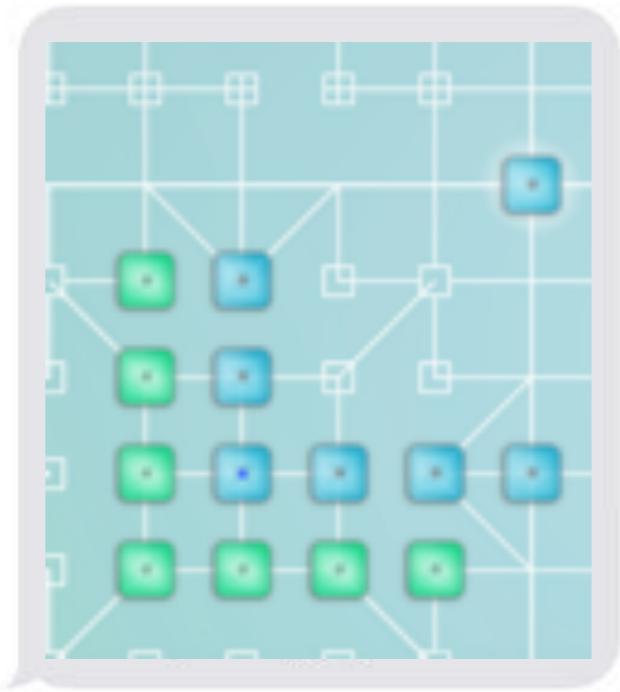
Resume Match

New Match

Take inspiration from
what you love

<3

pdf



Today 10:26 AM

researchgate.net



Delivered



iMessage



PENTE



RESUME

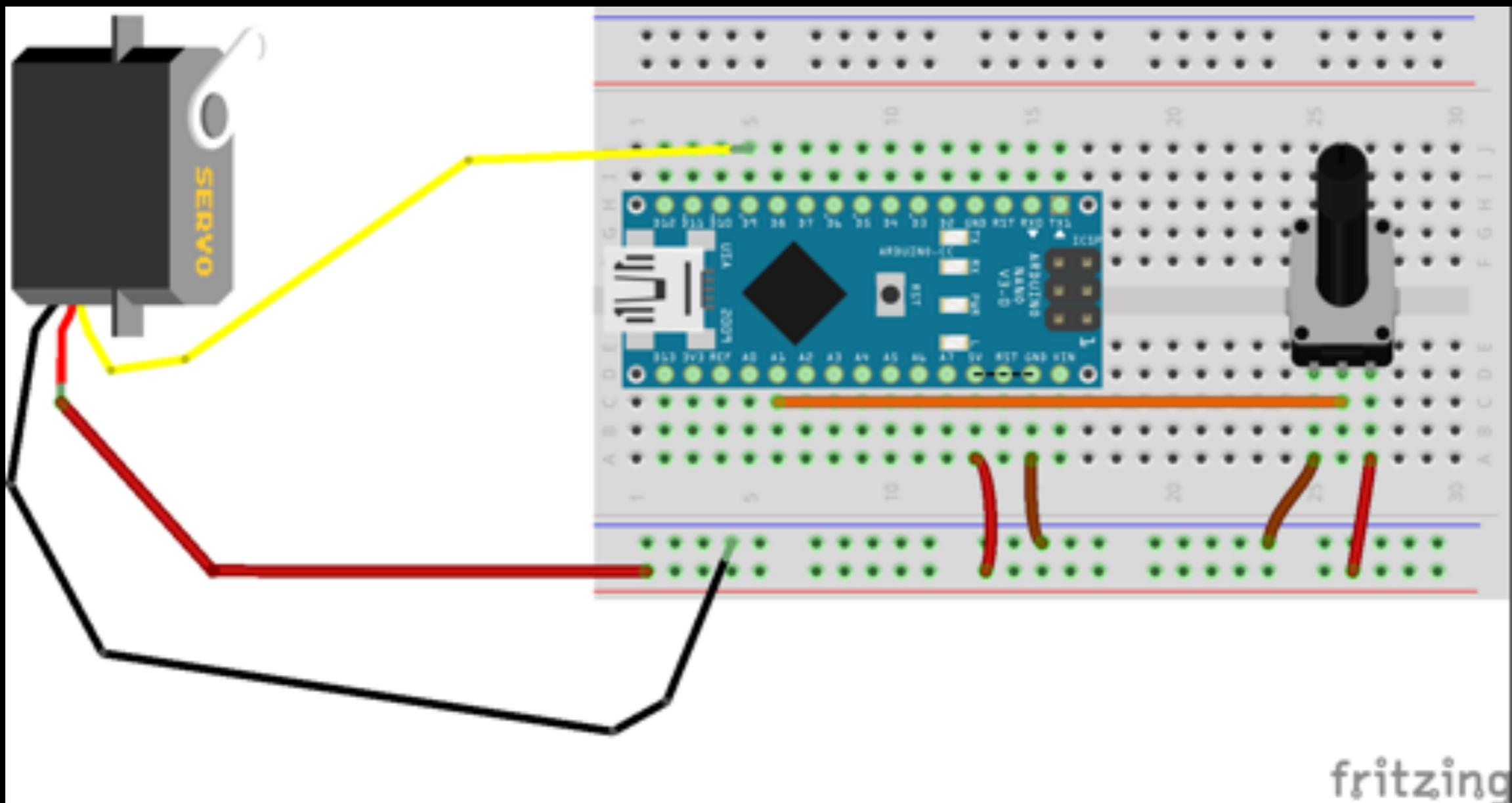
NEW GAME

Talk about, write about, and visualize your ideas

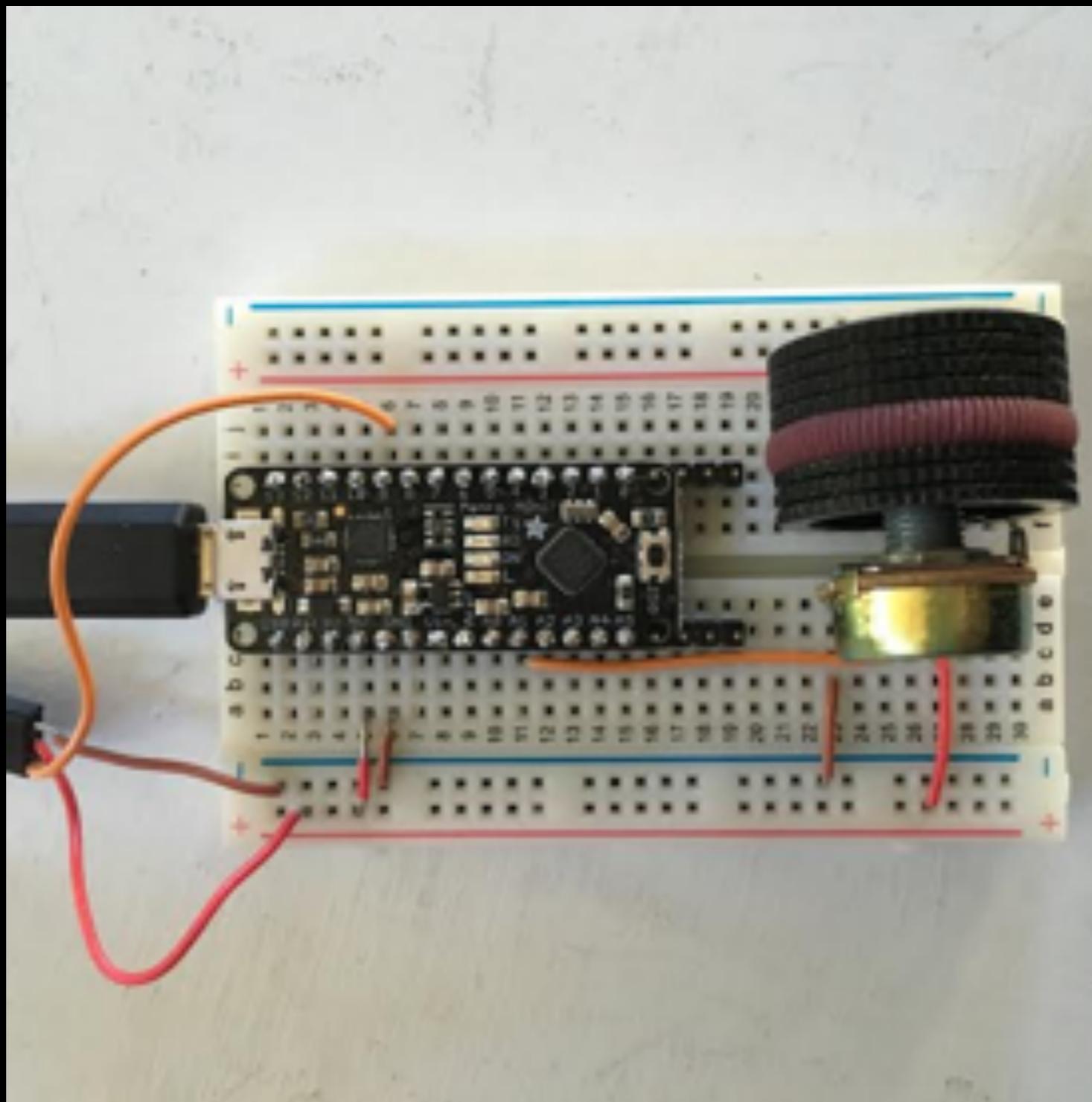
Different parts of our brains have different constraints, alternating between them nurtures our creativity

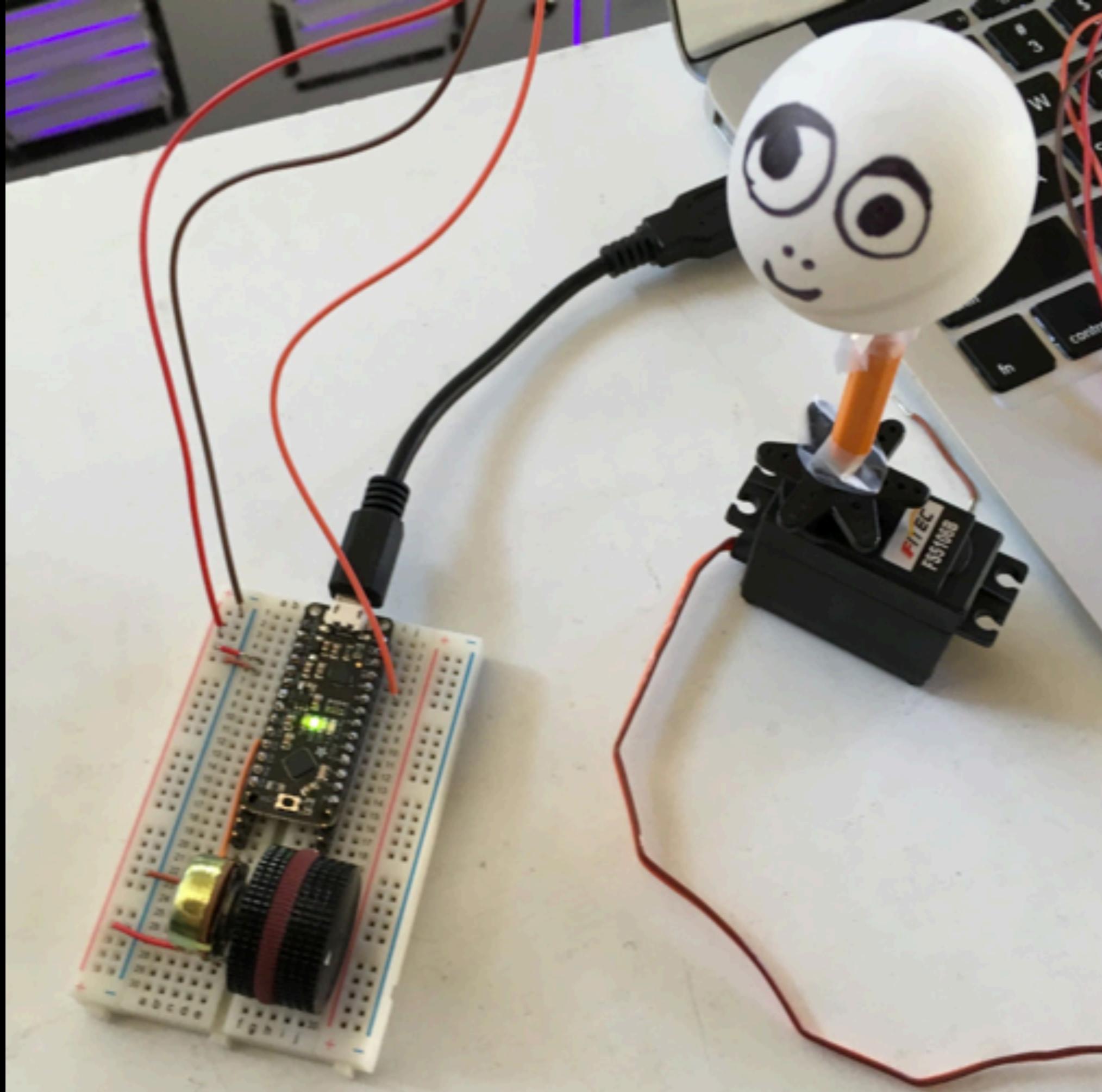
Case Study 2: Interaction Engine Robot

Simple Arduino circuit

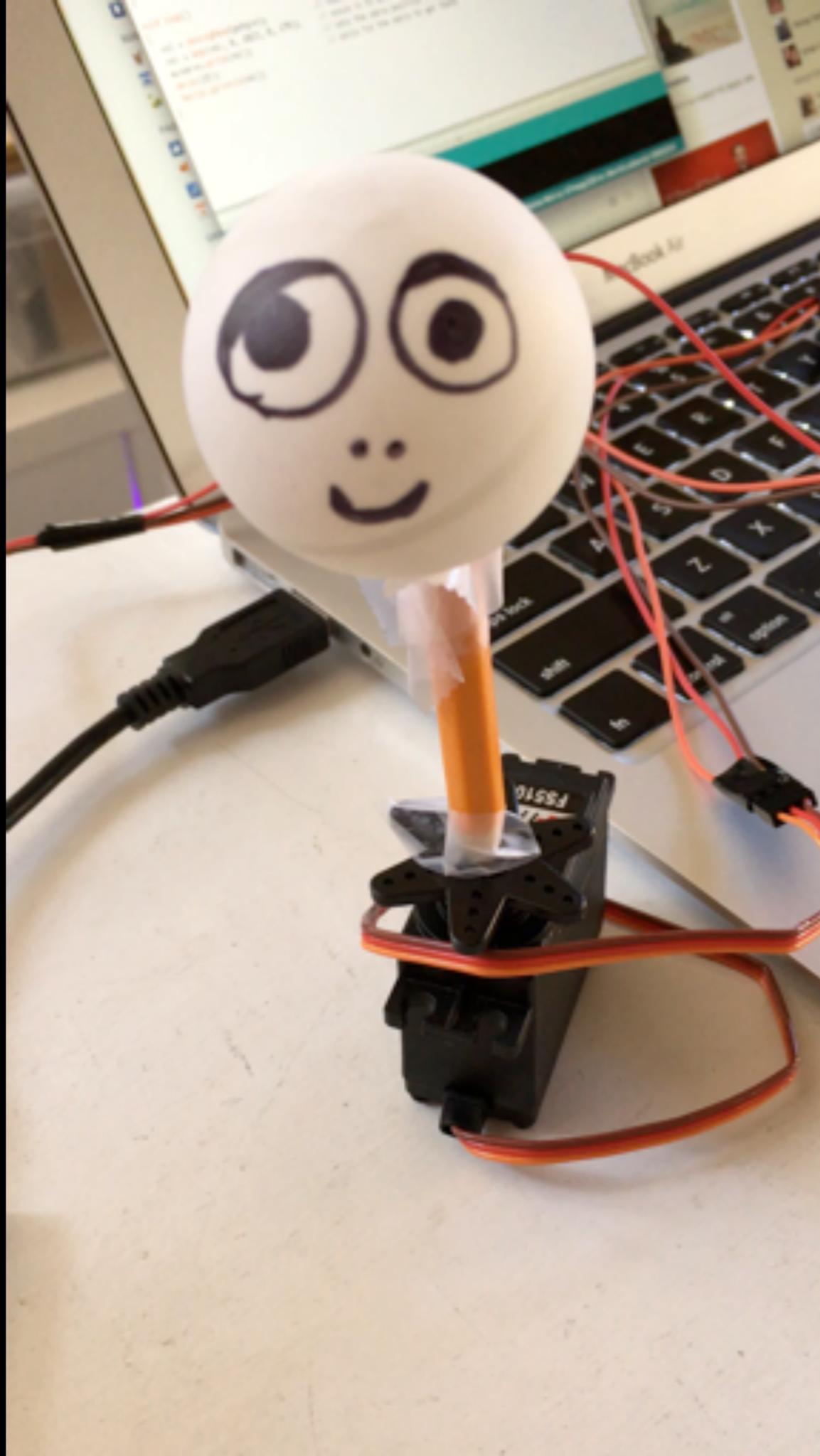


Simple Arduino circuit

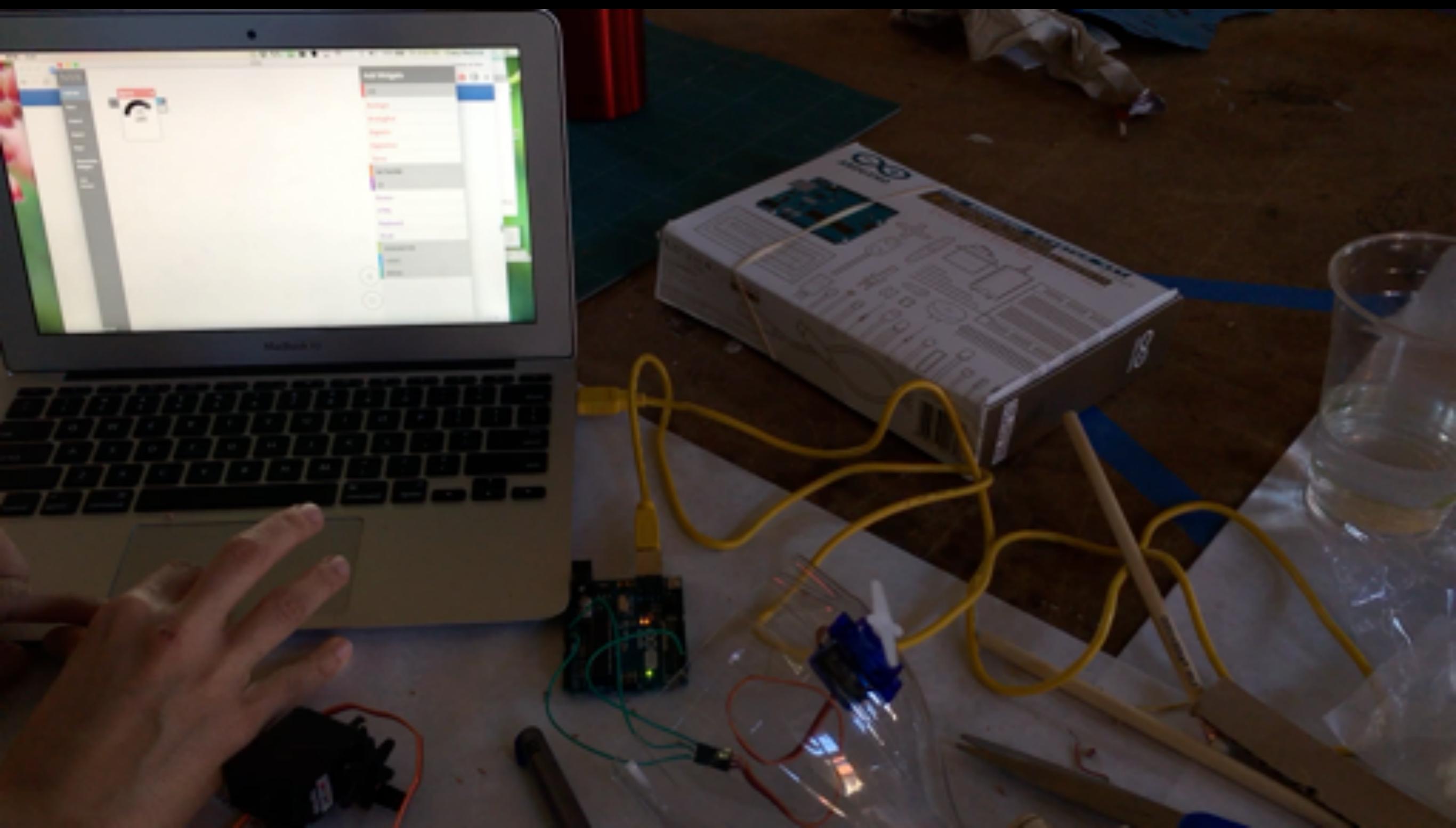




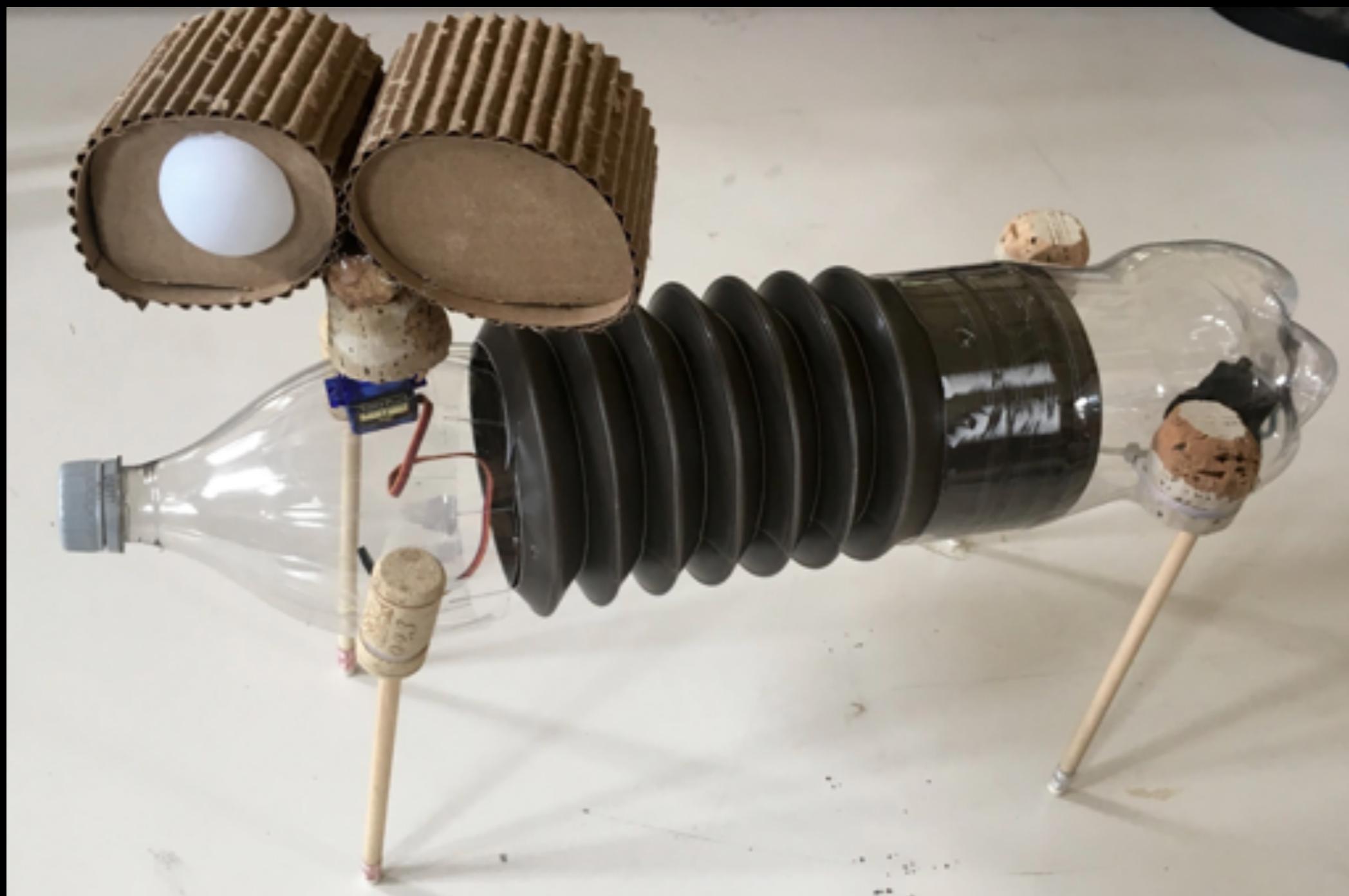
Adding meaning

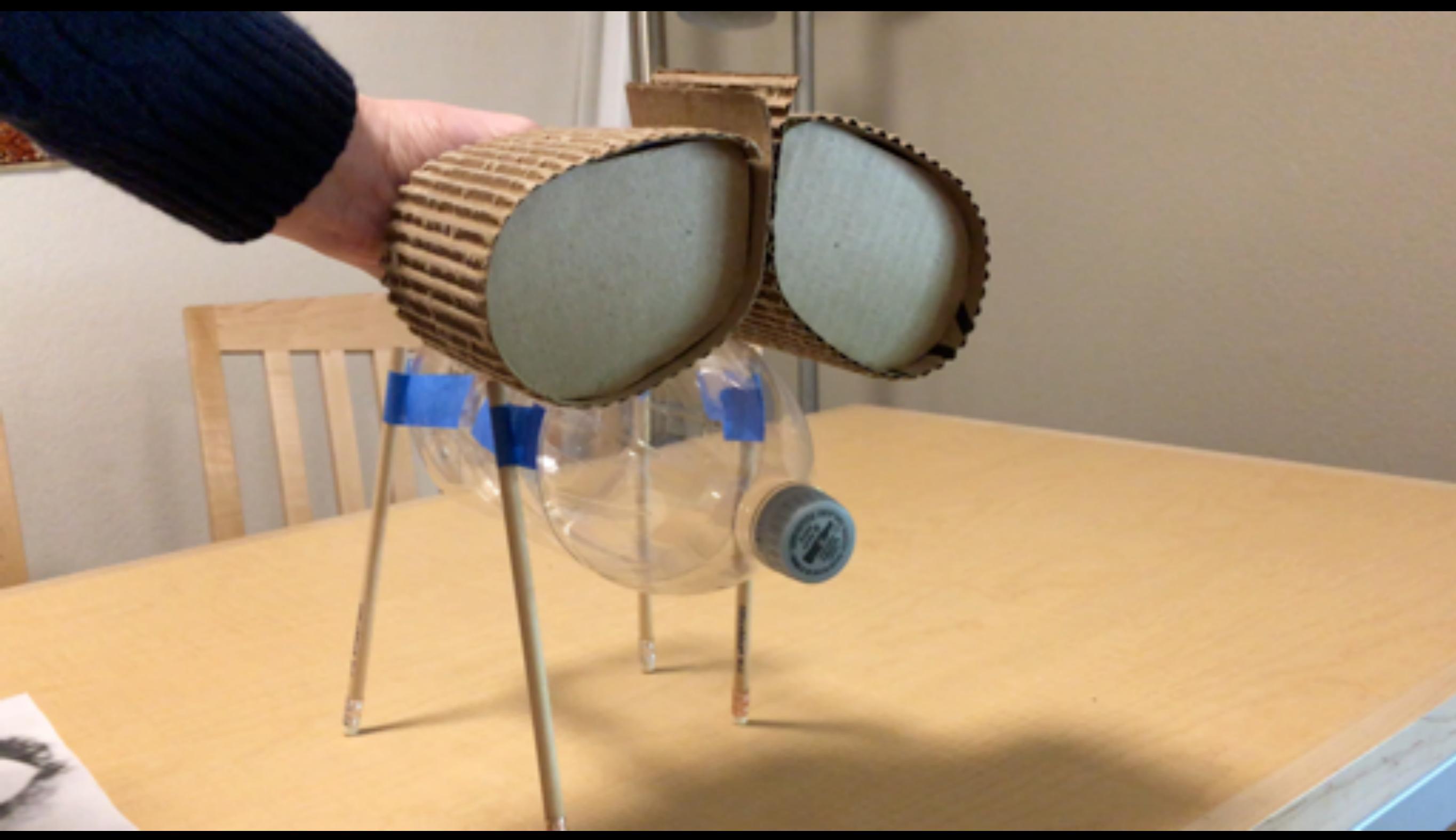


Control from your comp



Adding meaning 2

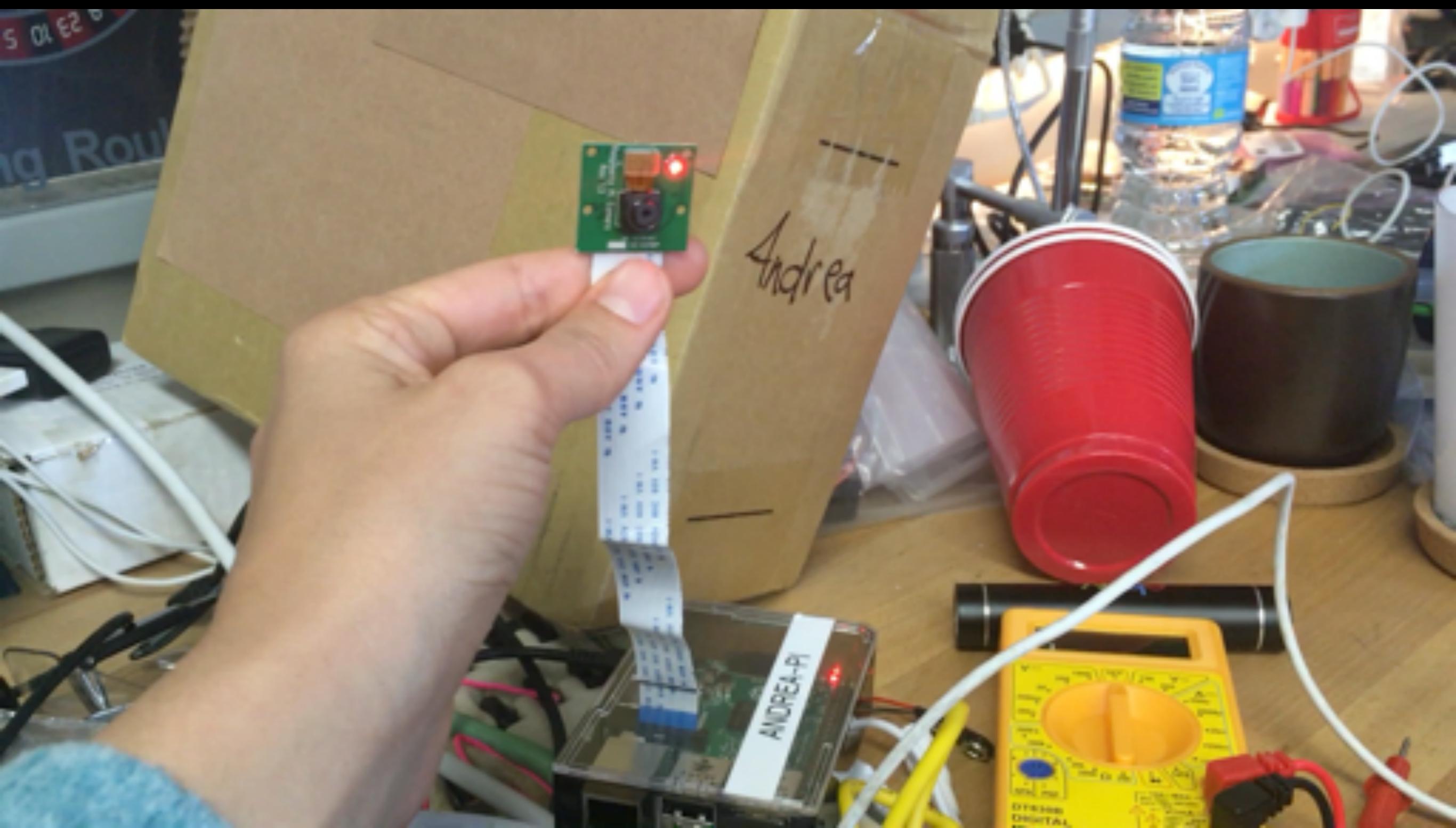




Movement

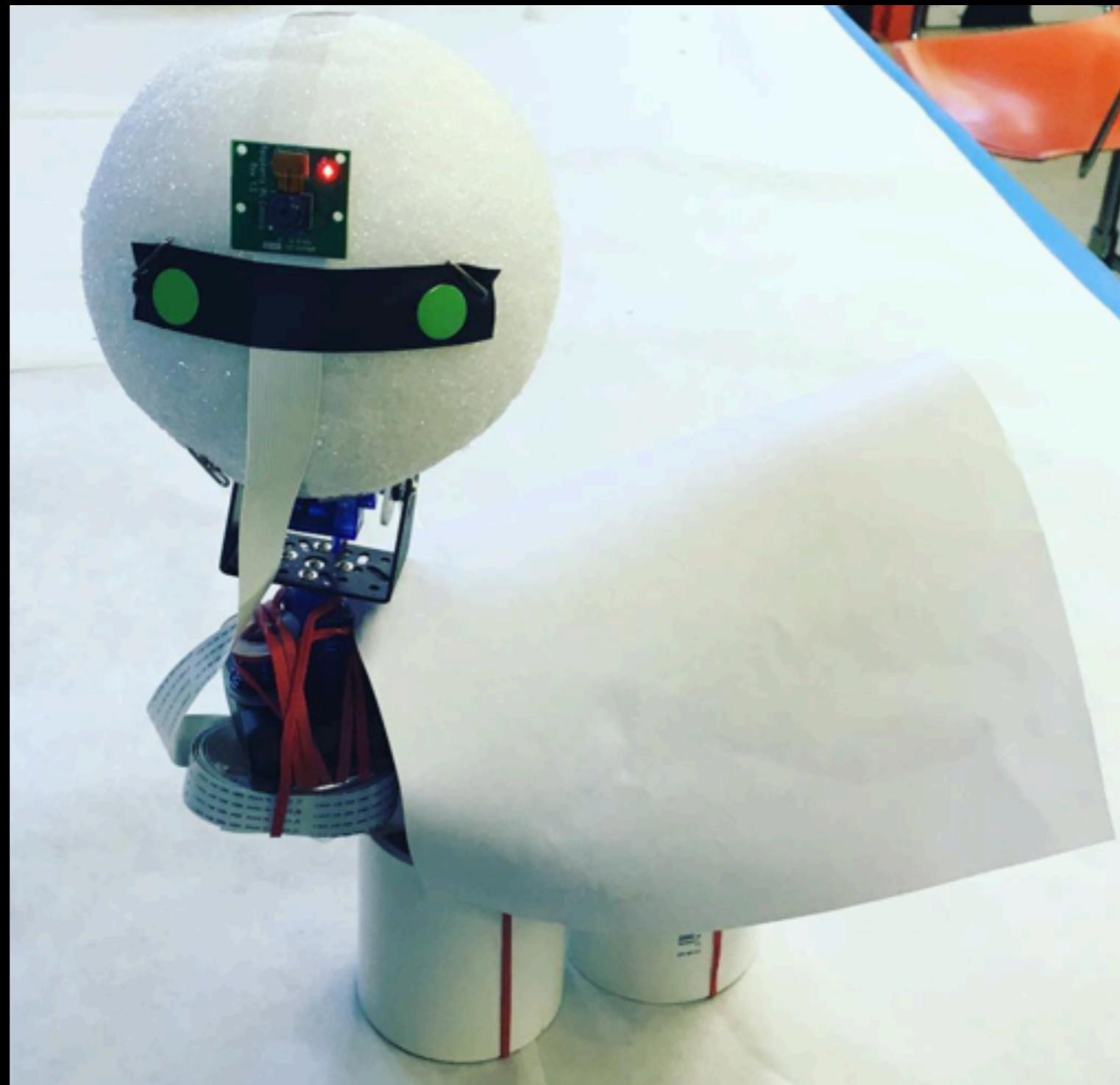


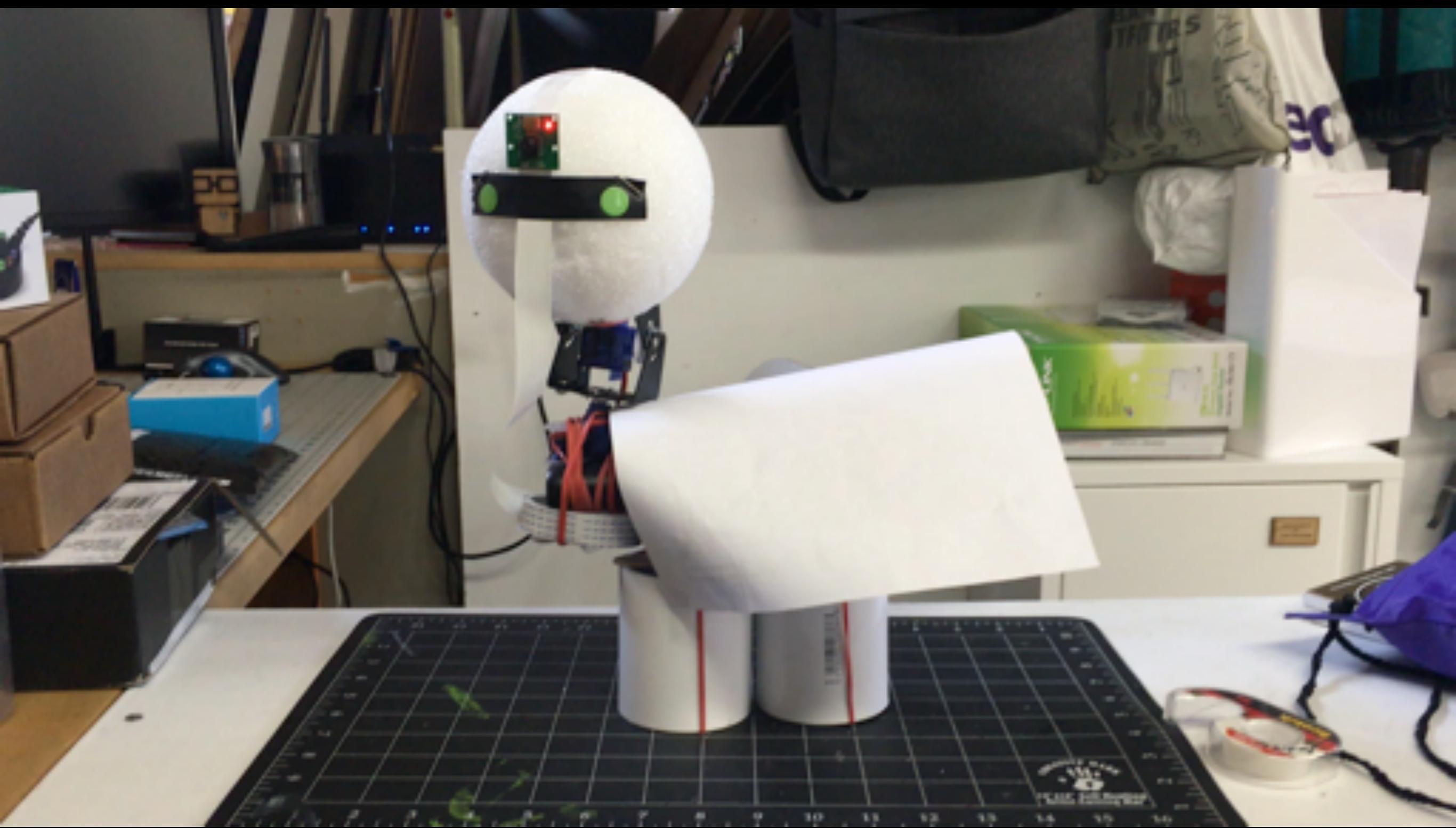
Functional milestone



Wirelessly controllable, battery-powered, camera stream, sound

Standalone





More stability

Camera

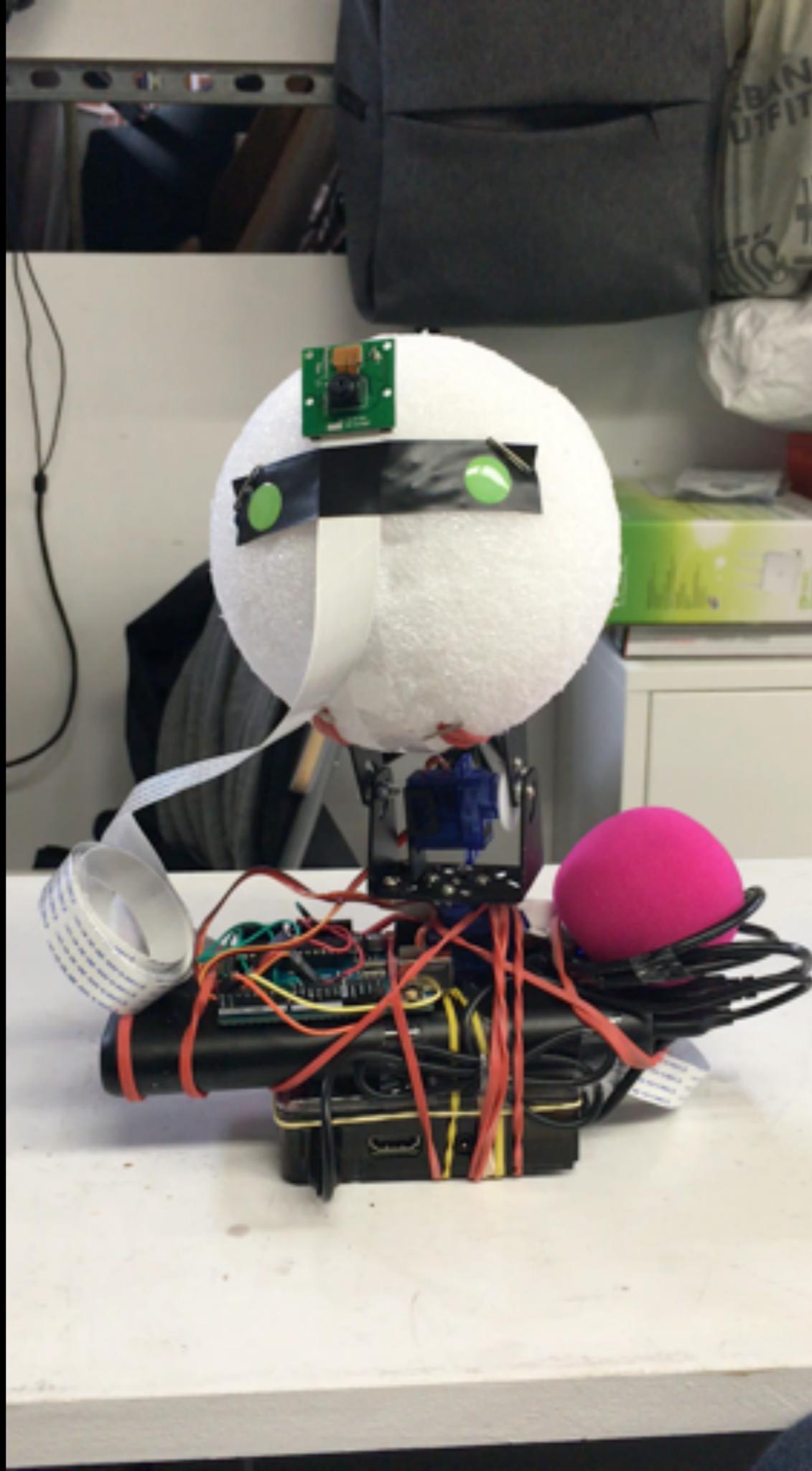
Pan tilt servos

Speaker

Arduino

Battery

RPi



Ugly



Ella—the mediator bot

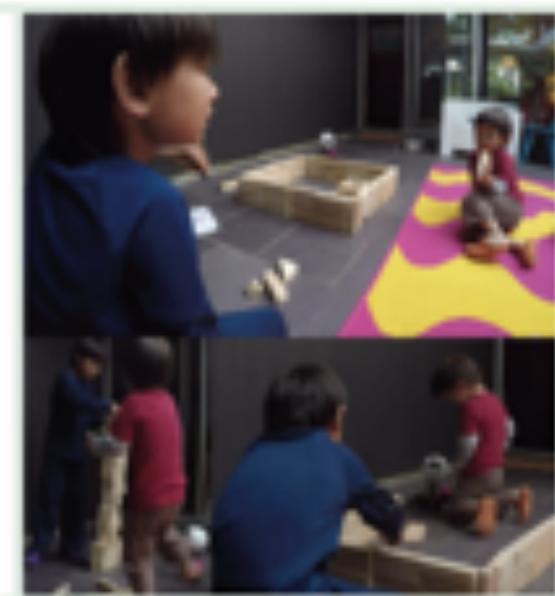
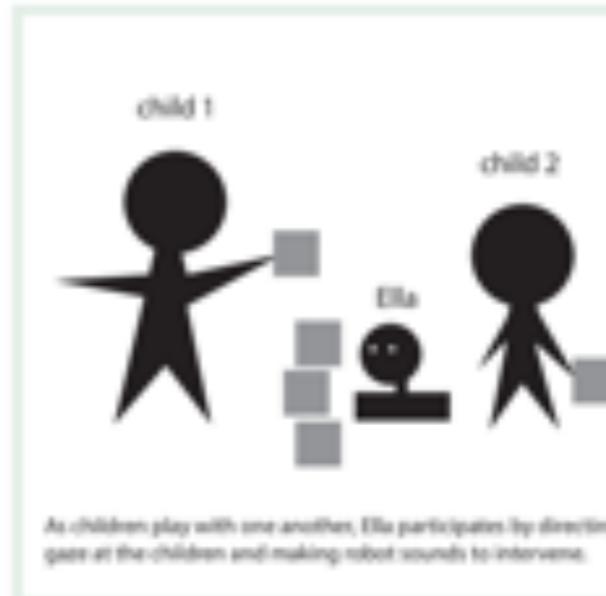
Andrea Cuadra, Nik Motelaro, Malte Jung, Wendy Ju

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

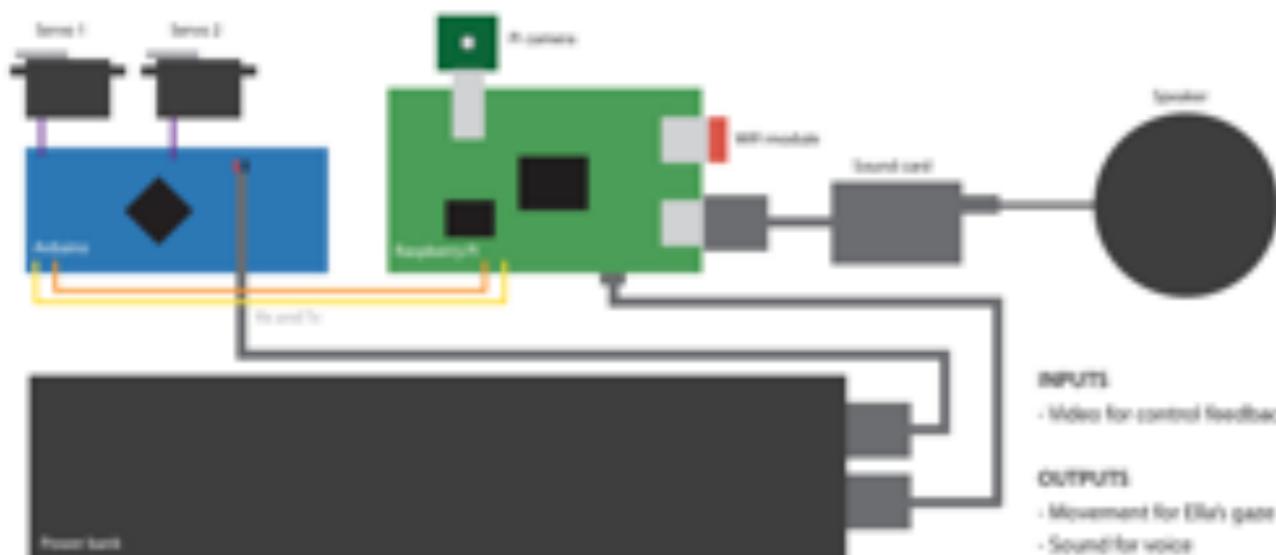
Moderation



INTERACTION



HARDWARE DESIGN



INSIGHTS FROM PILOT STUDY

Ella was able to influence conflict in a few different ways: (1) calling out certain actions; (2) distracting an upset child. Ella had a very strong presence, and the interaction was not referred to as "staged" as in studies with adults [7]. 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 gas how the types of sounds Ella should make depending on whether Ella wants to collaborate, 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, D. Zuckerman, G. Hirshberg, M. Juris, and T. Shan Sherman, "Design and Evaluation of a Peripheral Robotic Companion Companion," Proc. Ninth Annual ACM SIGART Int'l Conf. Human-Robot Interact., HR'15, No. April 2014, pp. 3–10, 2015.



Taped servos

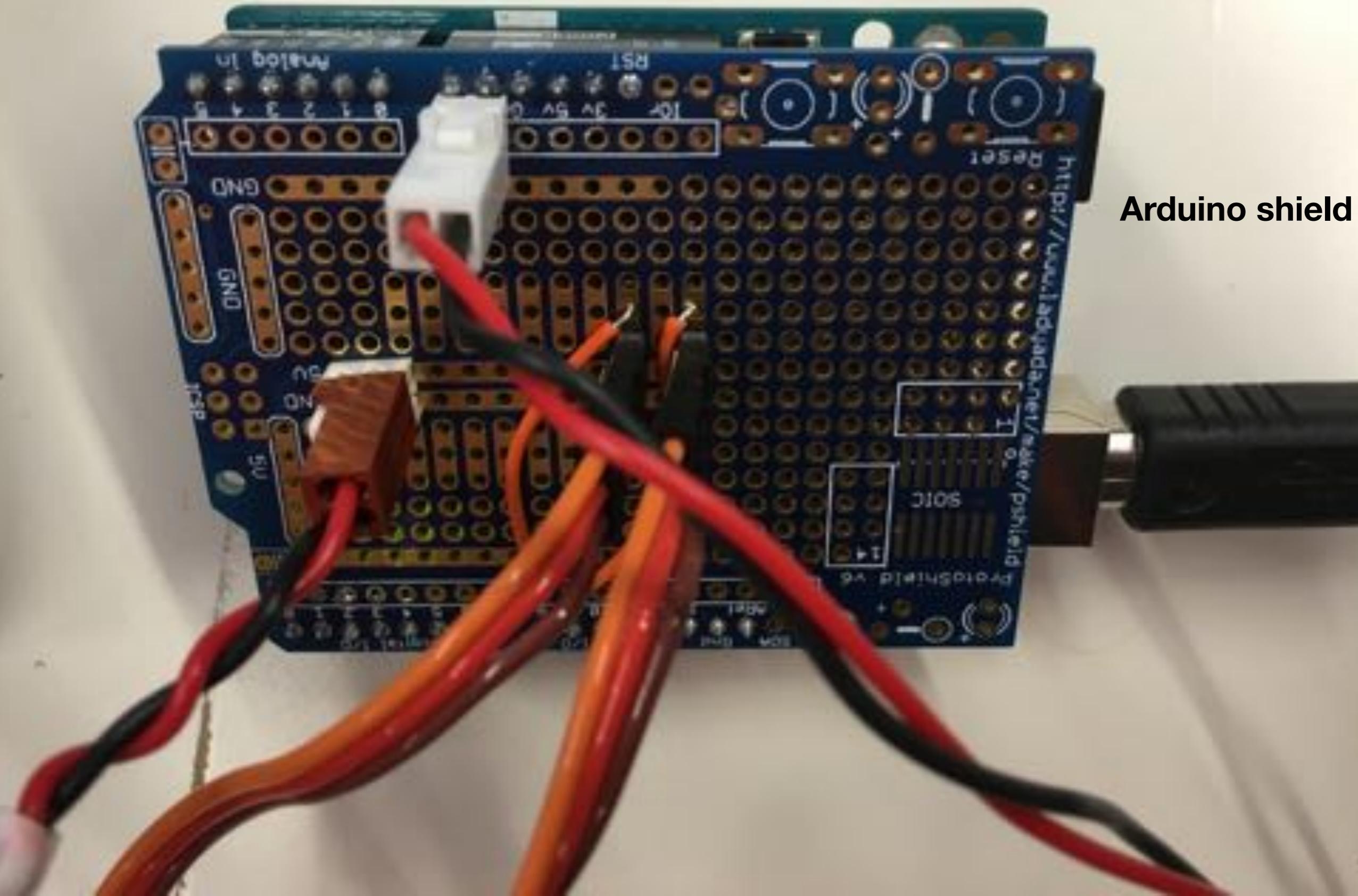


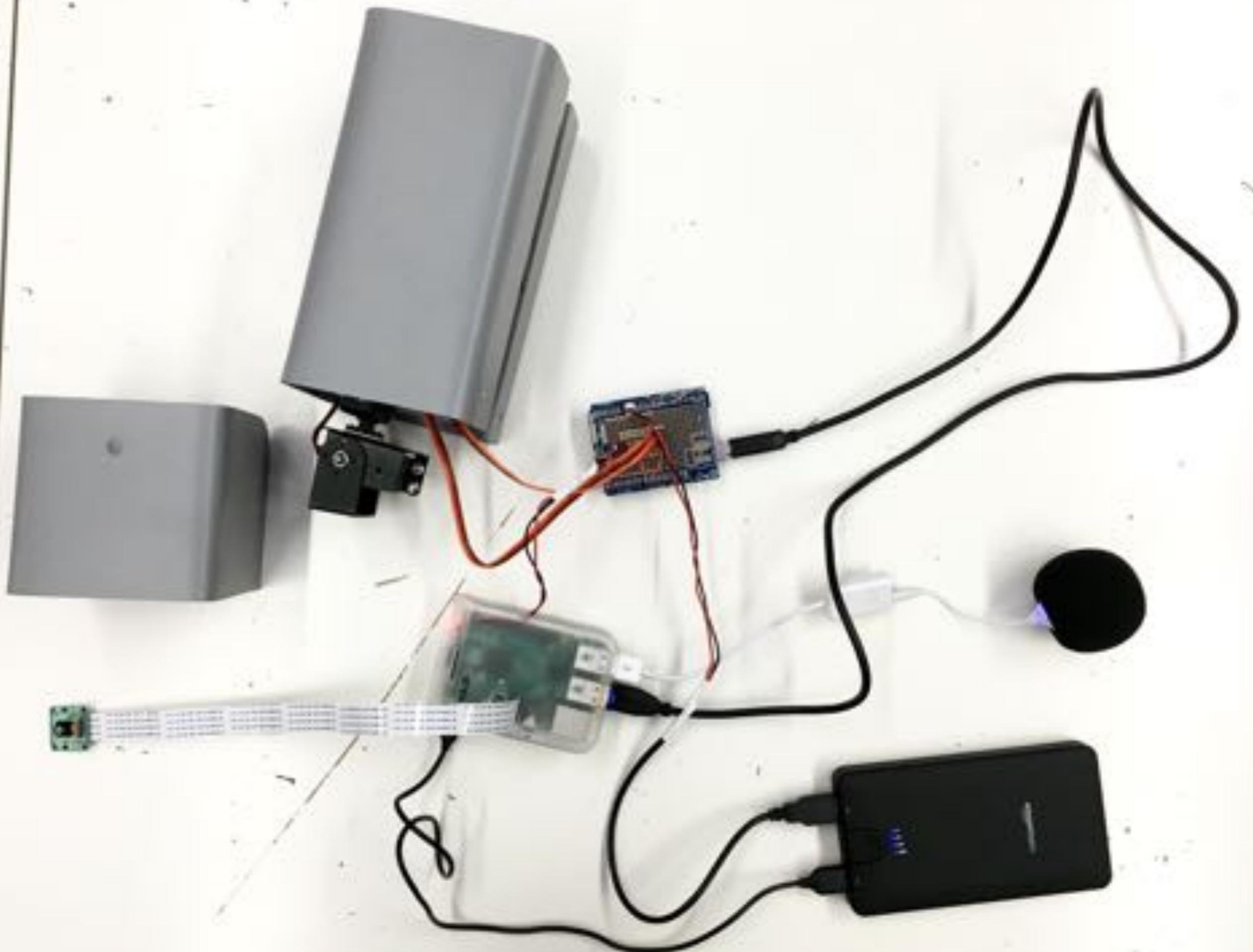
Working milestone... still using tape, camera still out of place



Soldered, robust electronics

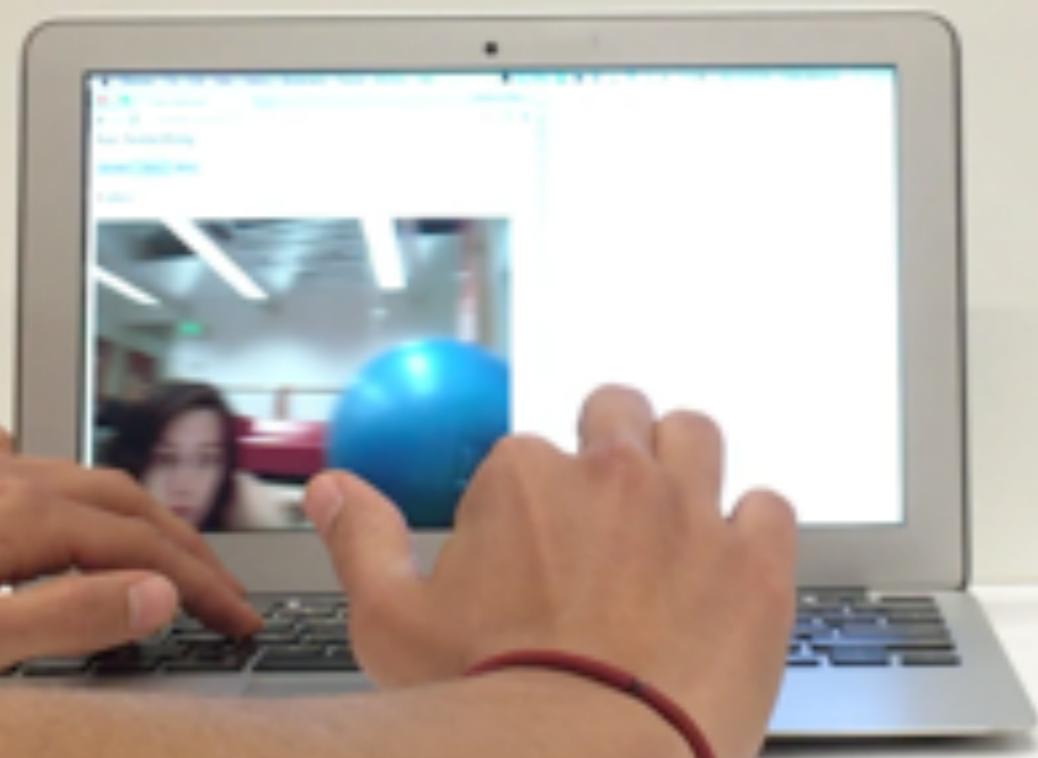
Connectors for protoboards





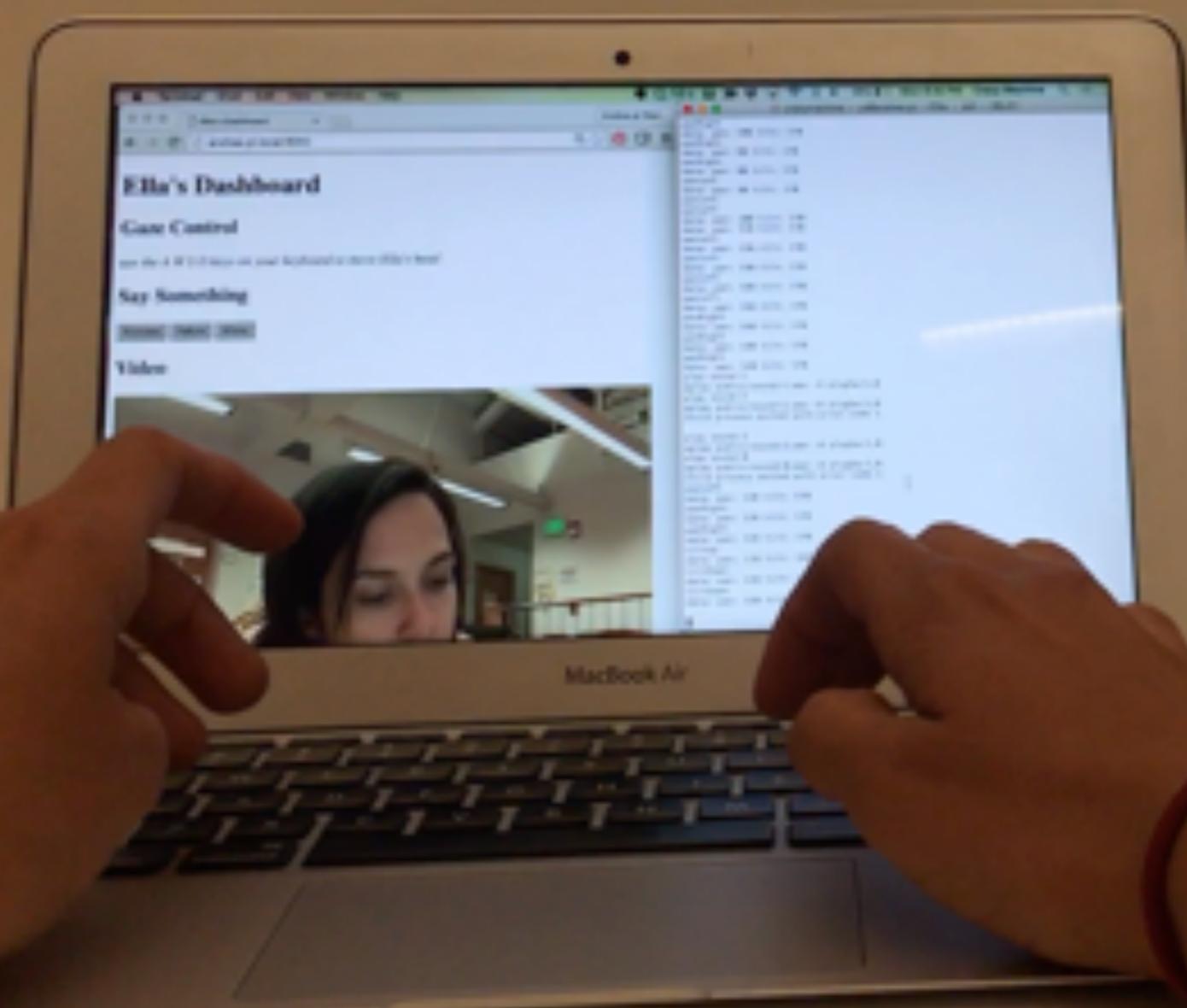
**Head orientation,
mobility problems**

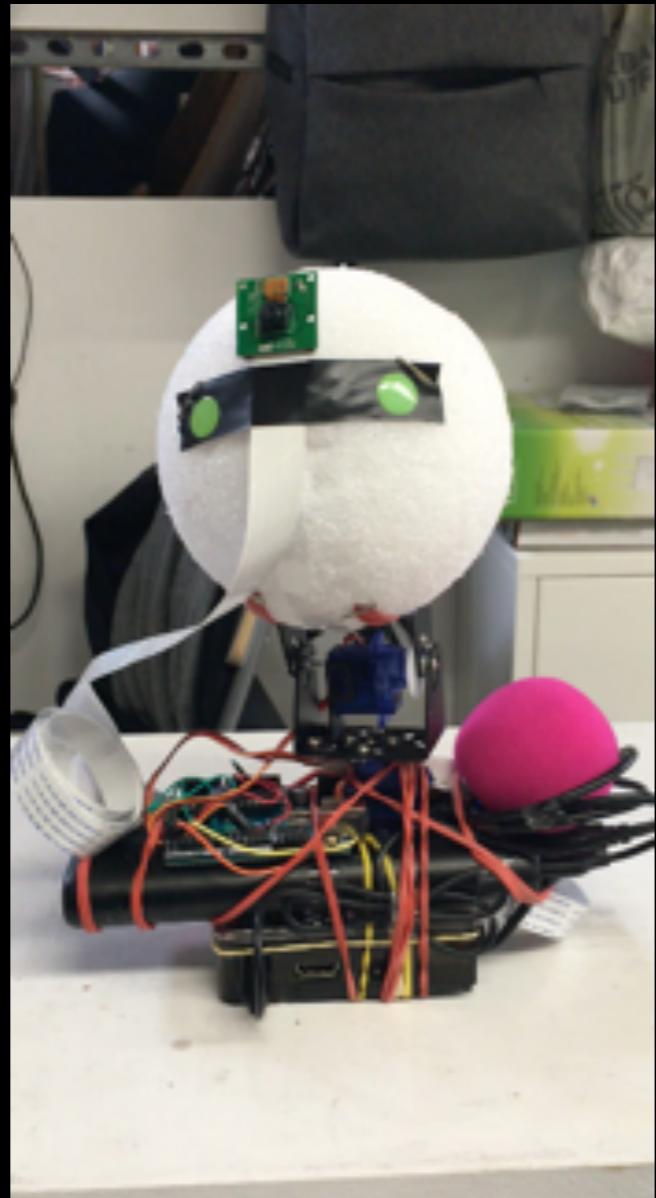






Servos mechanically mounted (not tape), camera well-integrated

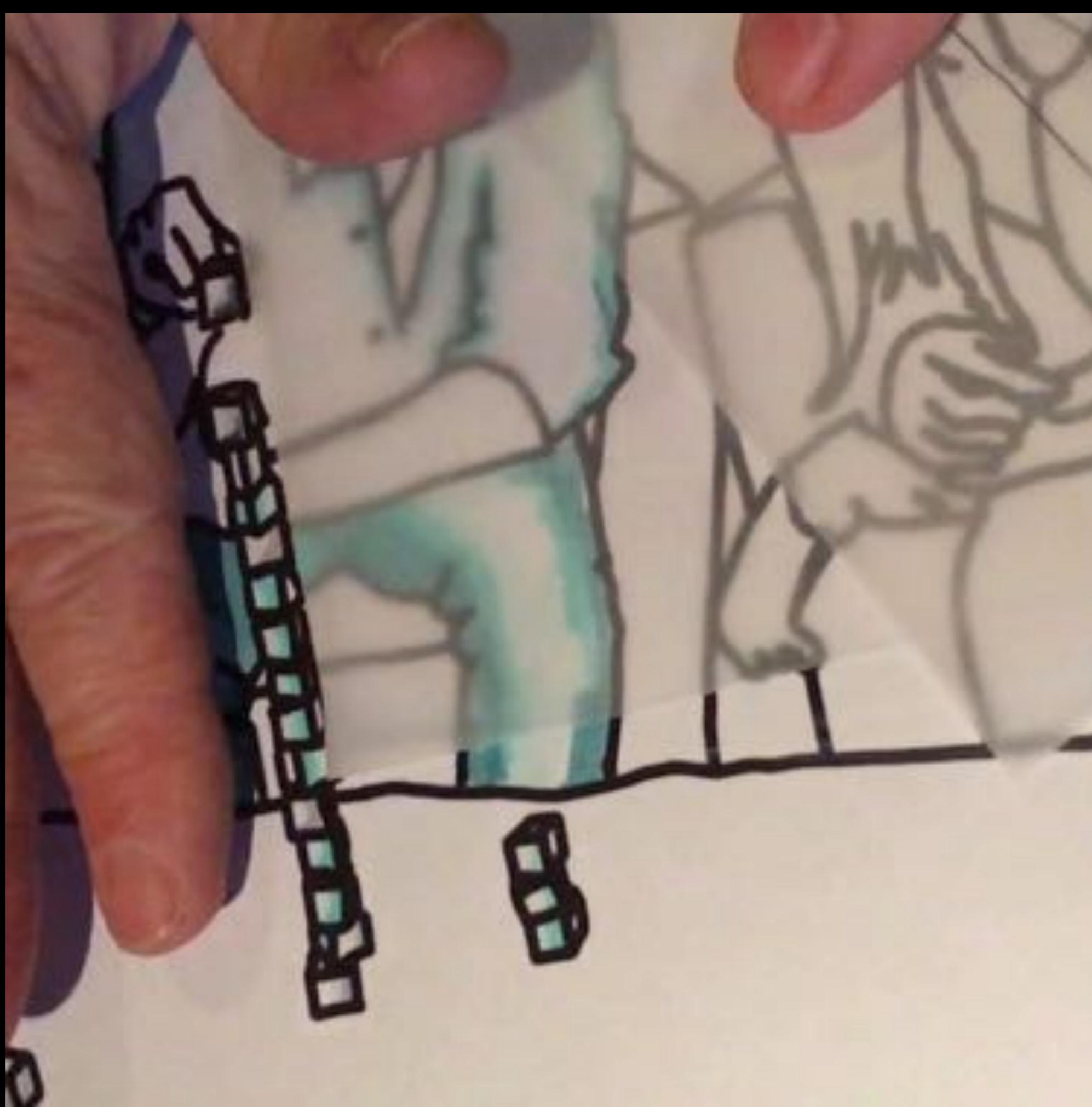




Case Study 3: Just some pretty cubes

sonal
lement













How I made them...

1

on your packing list

line

2

3

4

5

STAINLESS STEEL



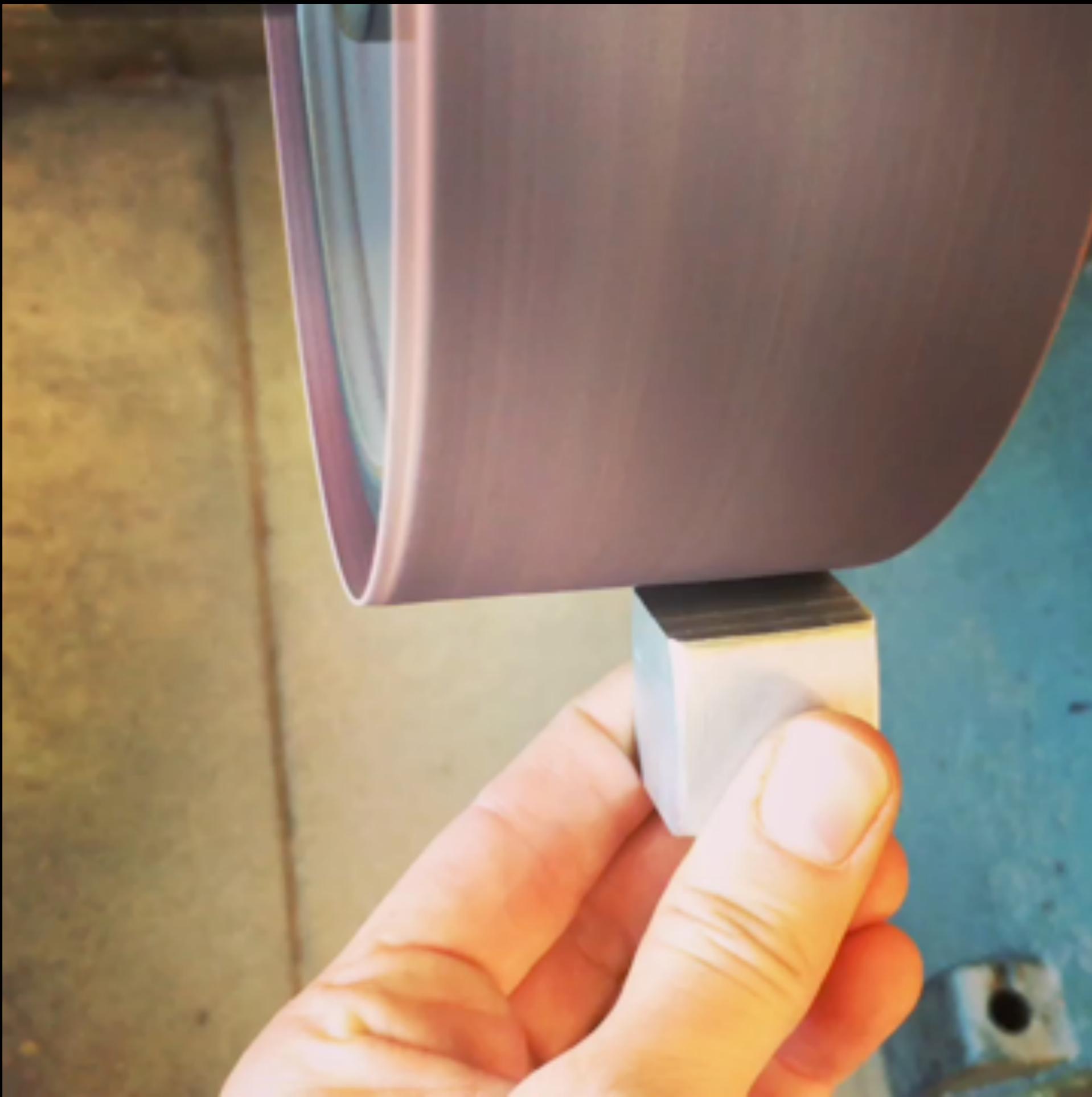
U.S.A.

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



Steel

















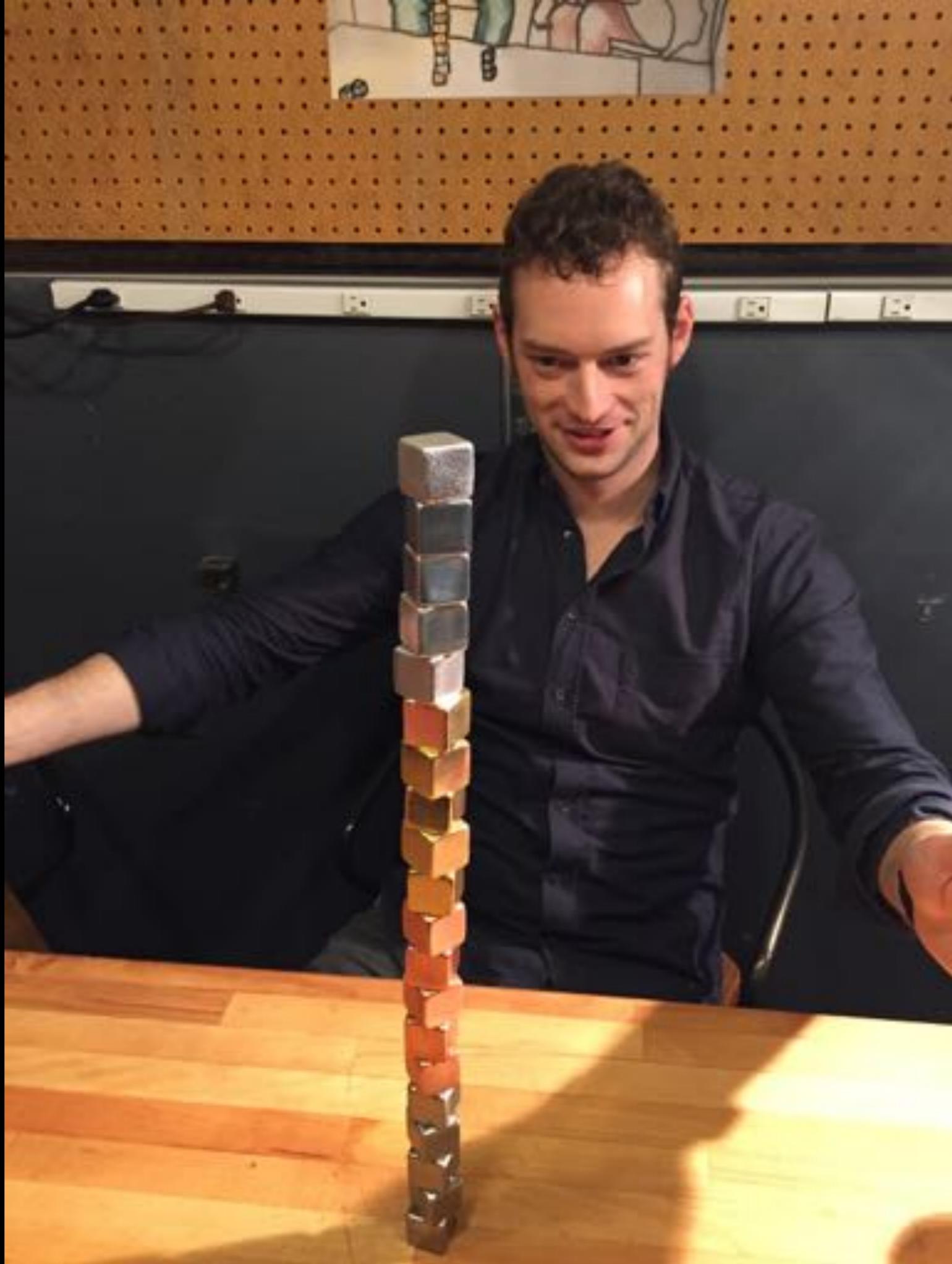


















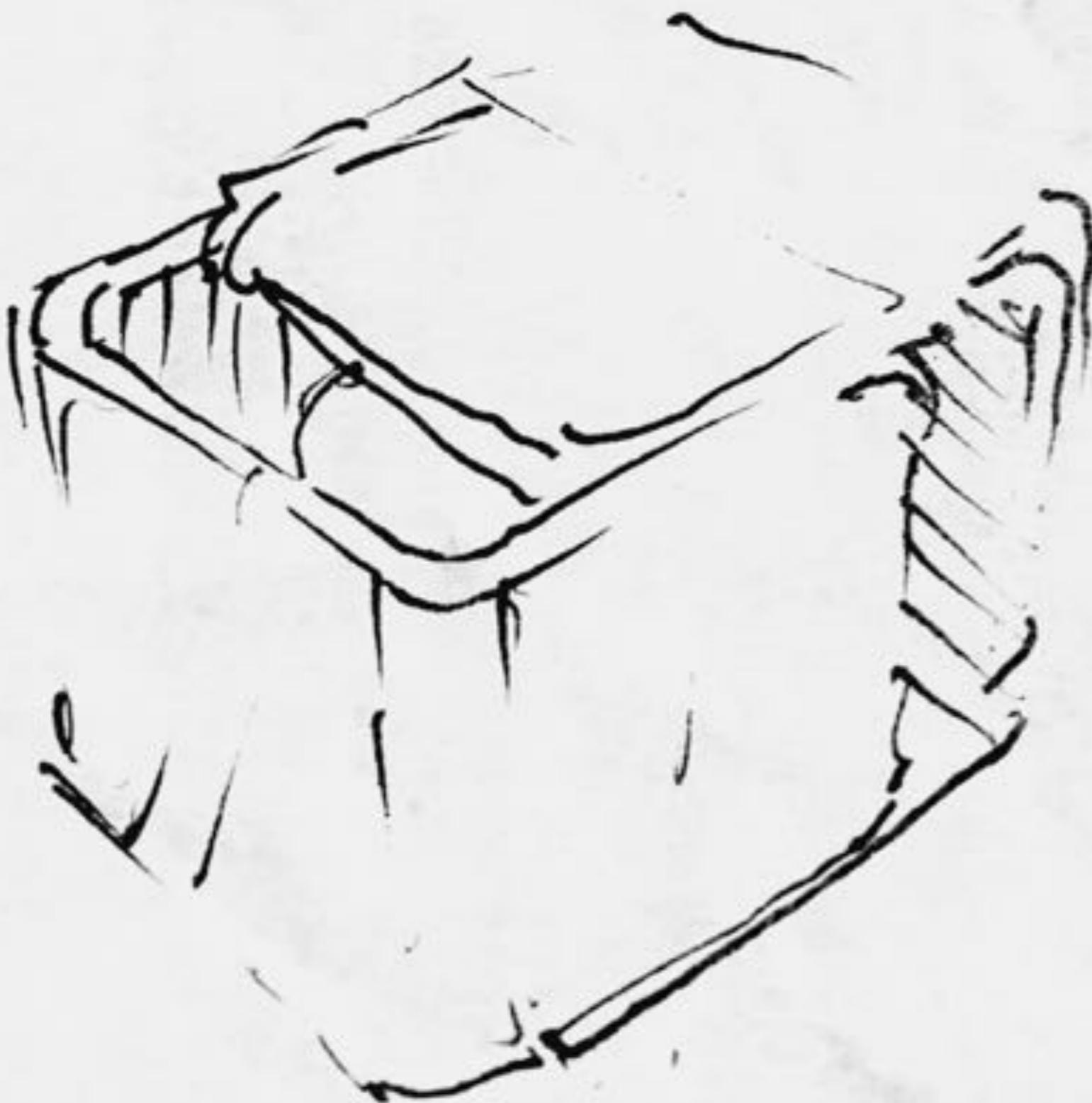


But actually... that's only the tail-end of the process



















Sanded (220)



Sanded (220)



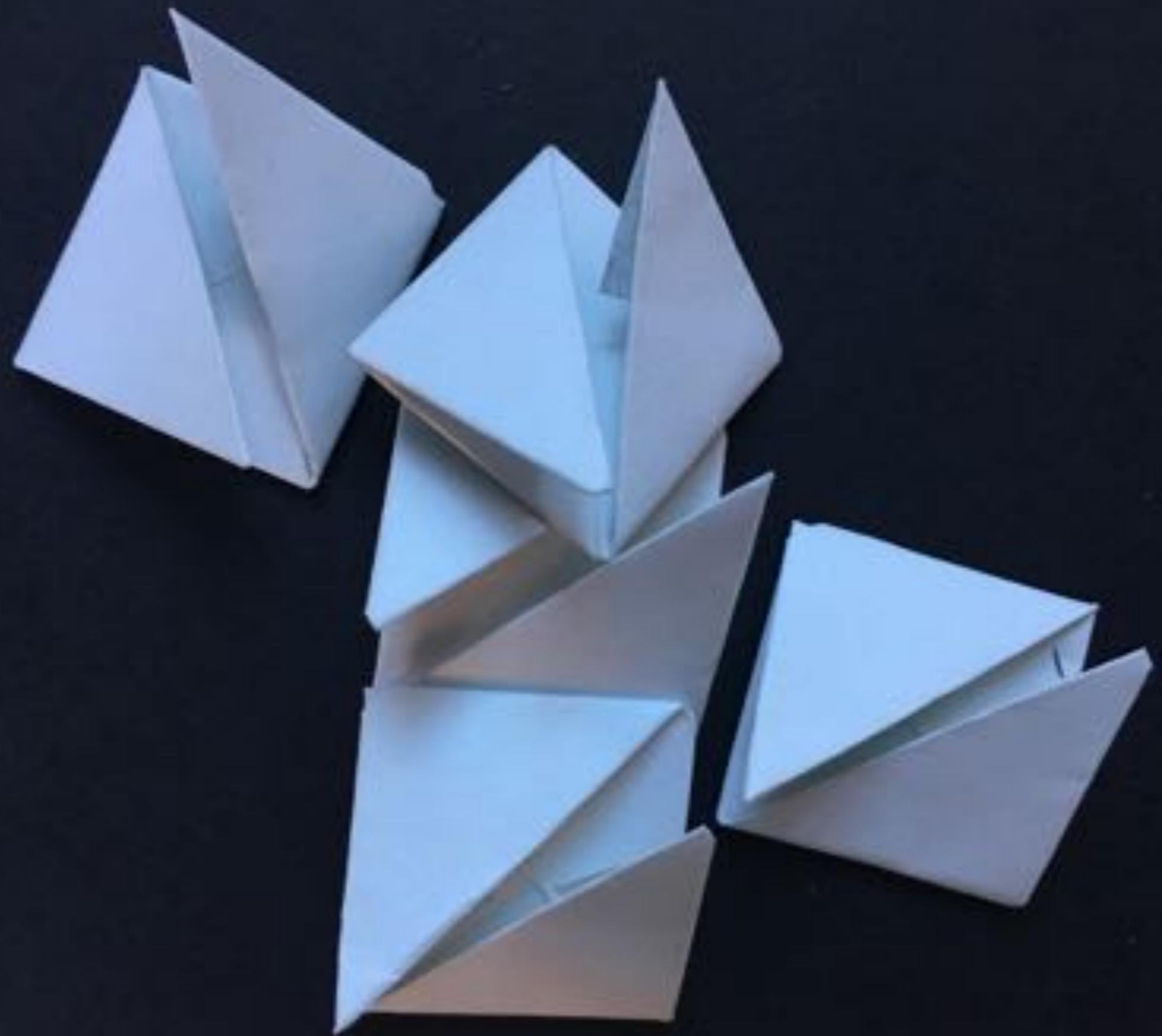
Sanded (220)

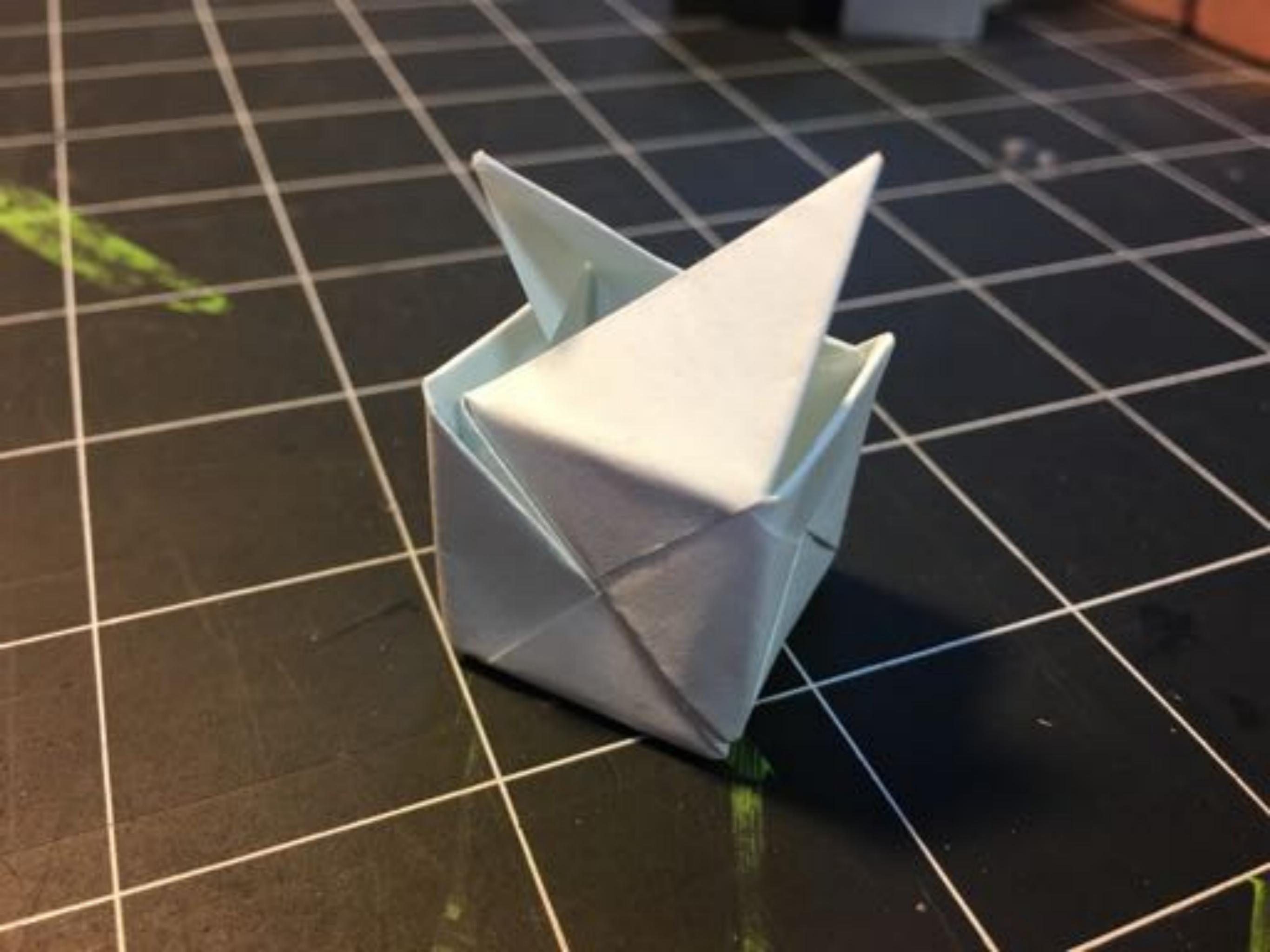


A photograph showing six wooden blocks of different sizes and finishes arranged on a light-colored surface. Three blocks are stacked horizontally in the center, and three are placed below them. The top block is dark brown and polished. The middle block is light tan and appears raw. The bottom block is dark brown and polished. To the left, there is a larger, rectangular block with a circular white sticker on it, which also appears raw.

Polished

Raw







**White
Delrin**

**Black
Delrin**

Wood

Brass

Copper

Aluminum

Acrylic

Paper

Wax

And now, what do I do with all these cubes in The House?



More images

Shaper CNC

Shaper Origin Features

Shaper Origin is the world's first and only hand-held **CNC** that's ready to create whenever and wherever you are! ... Work at Any Scale, Anywhere. Origin is a compact portable tool that thinks it's a big **CNC**. Do delicate joinery one day and route large plywood shapes the next.

[Shaper Origin - Rockler](#)

<https://www.rockler.com › shaper-origin>



Pr.

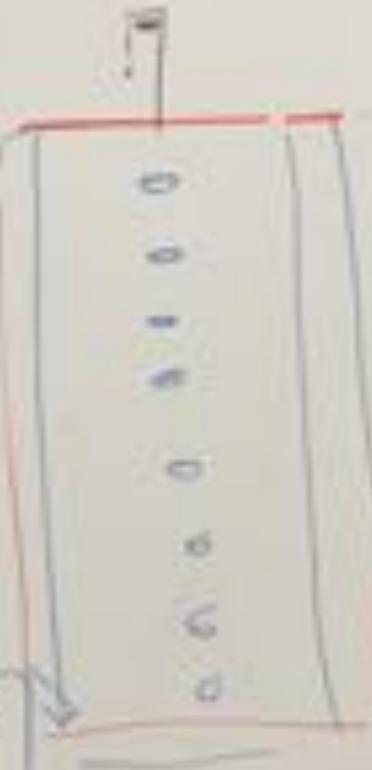


log



do get
shapes
quart / third

X	X-X	X
XXX	XXXXX	X

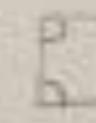
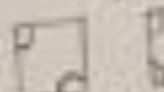


X



cp

cp



alma

blue

red

green

yellow

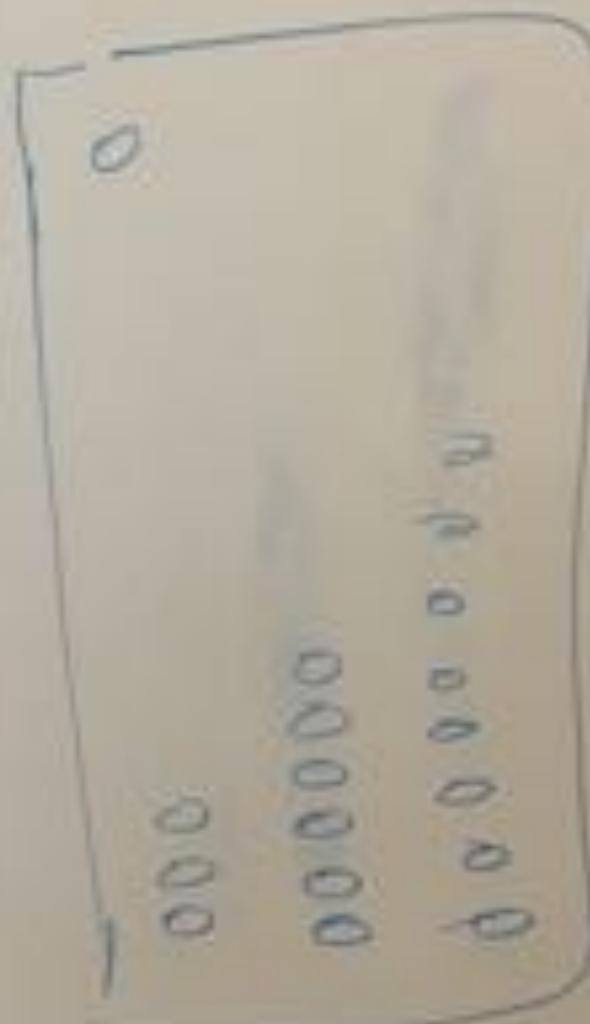
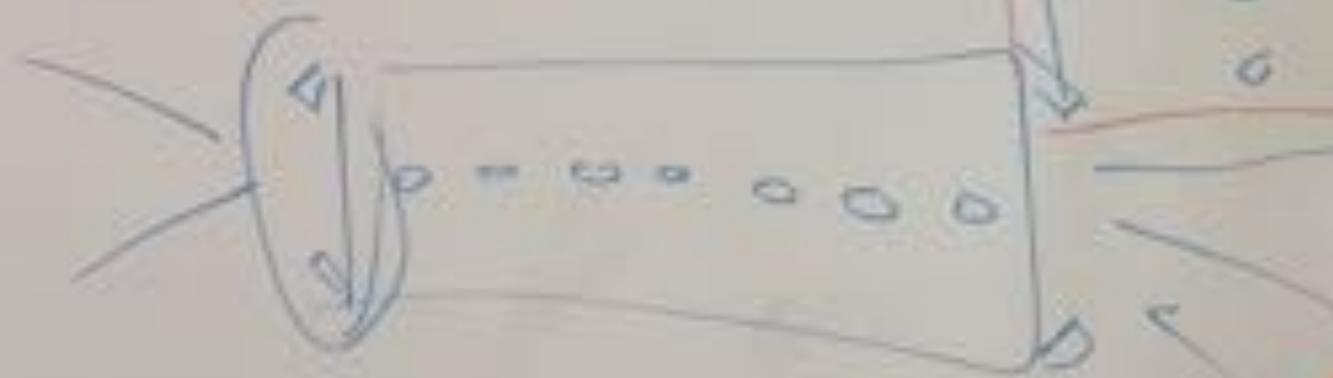
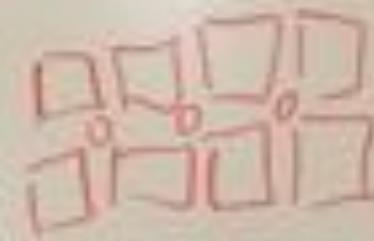
purple

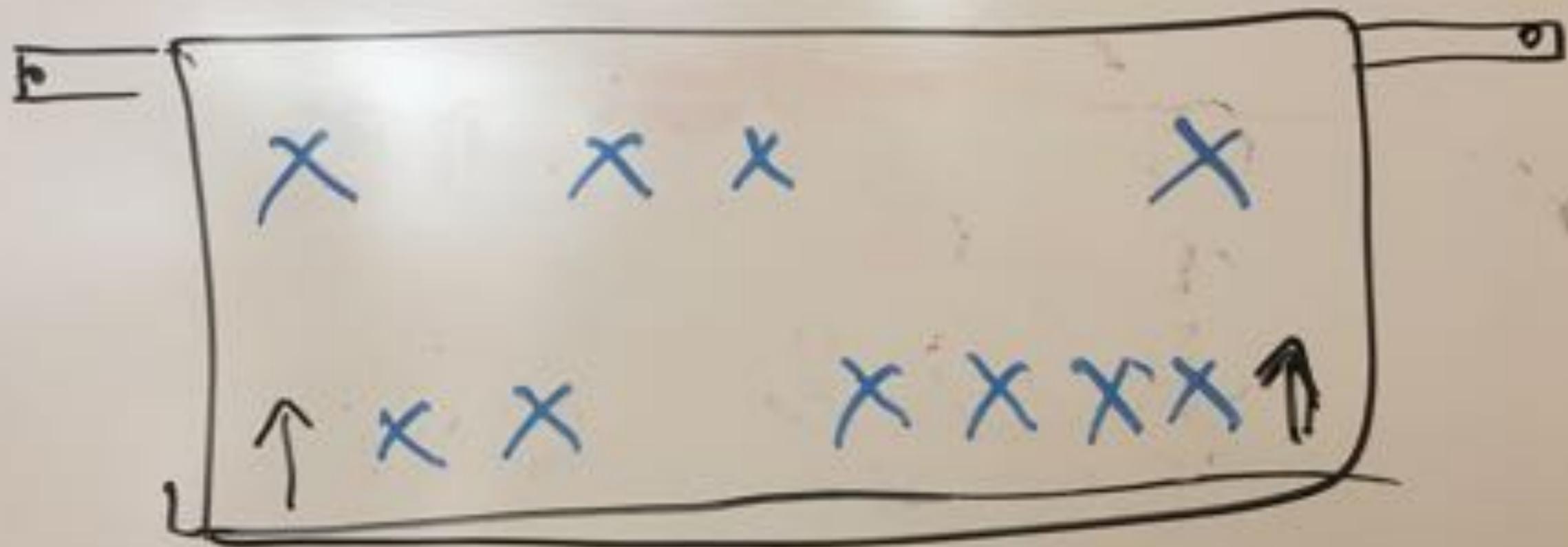
orange



described
shapes
count / spell

09













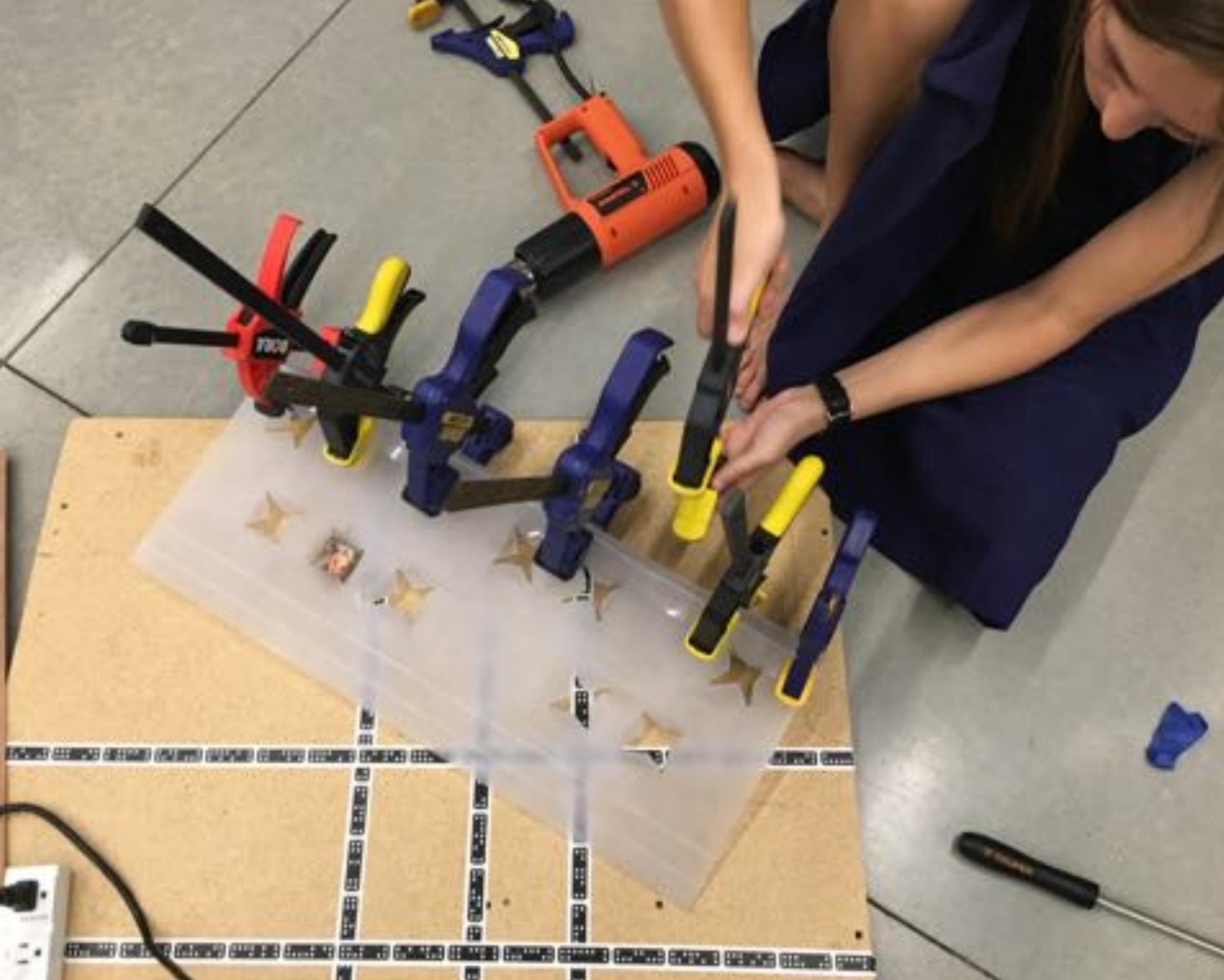


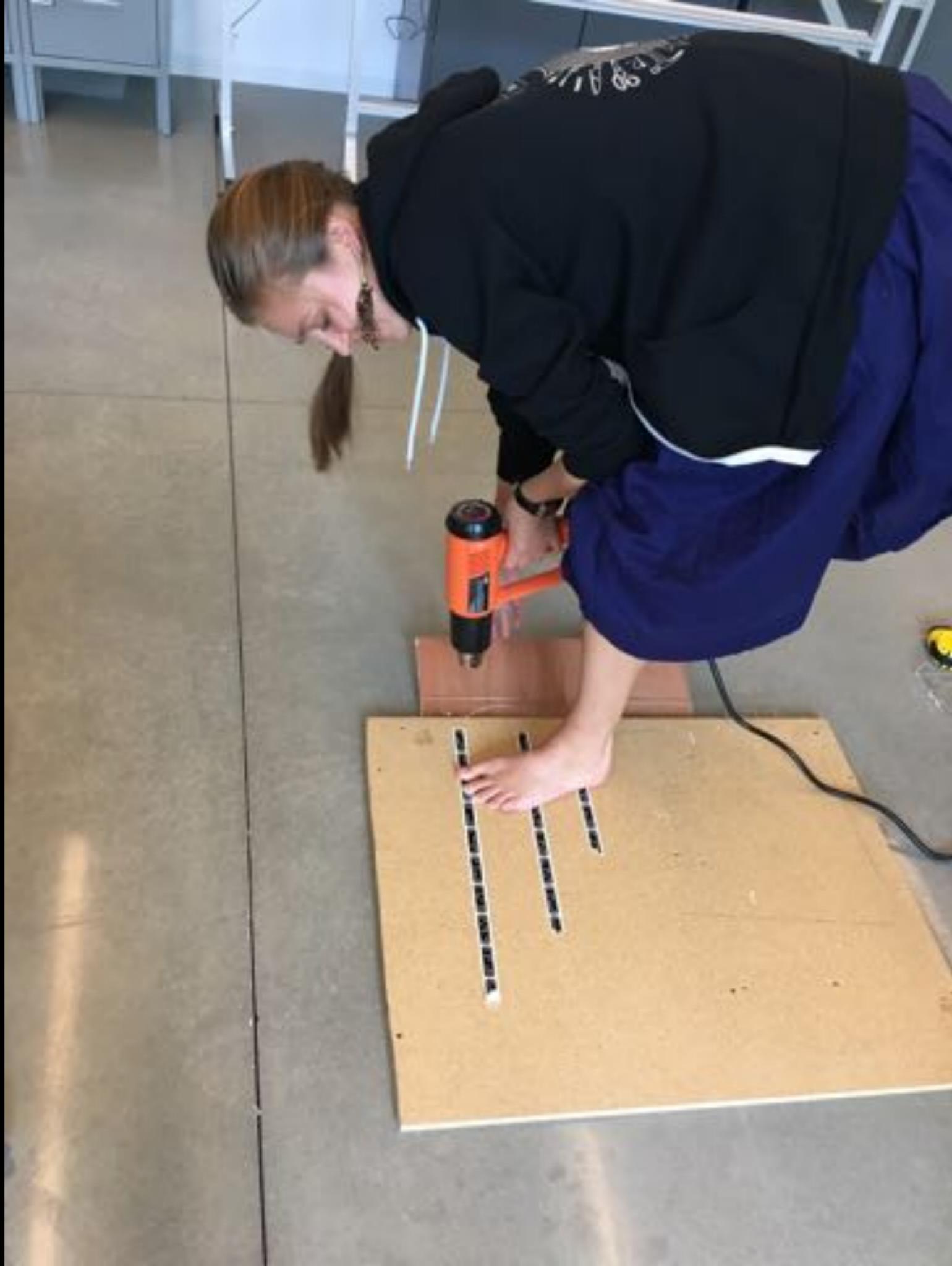






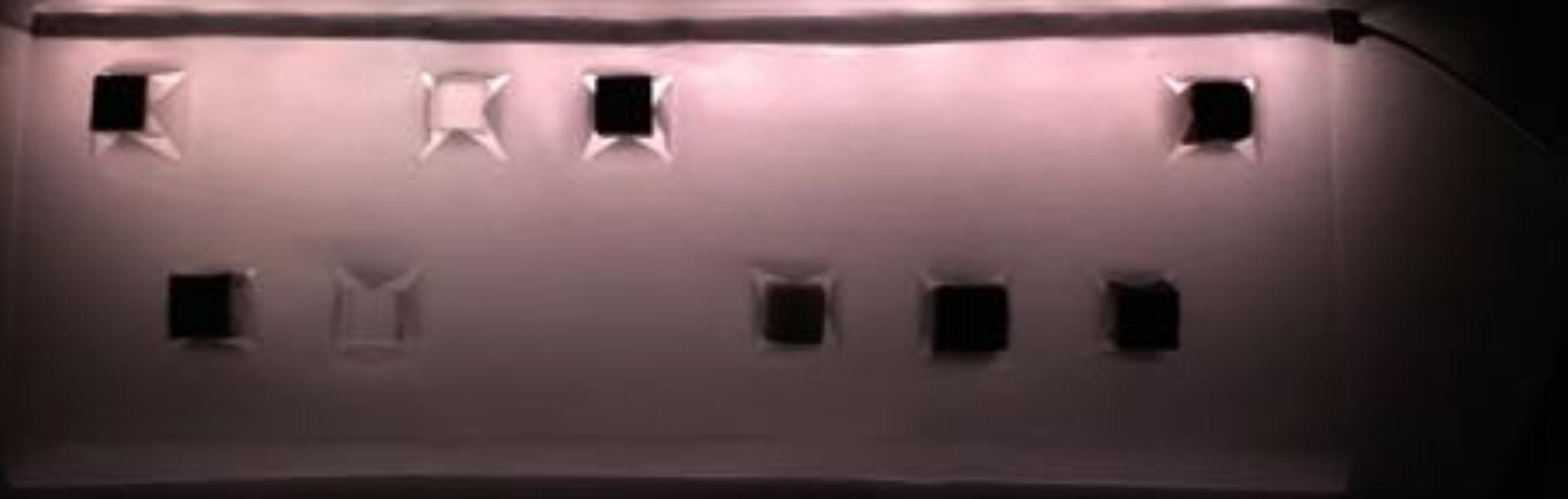












Thank you!

-o-o-