

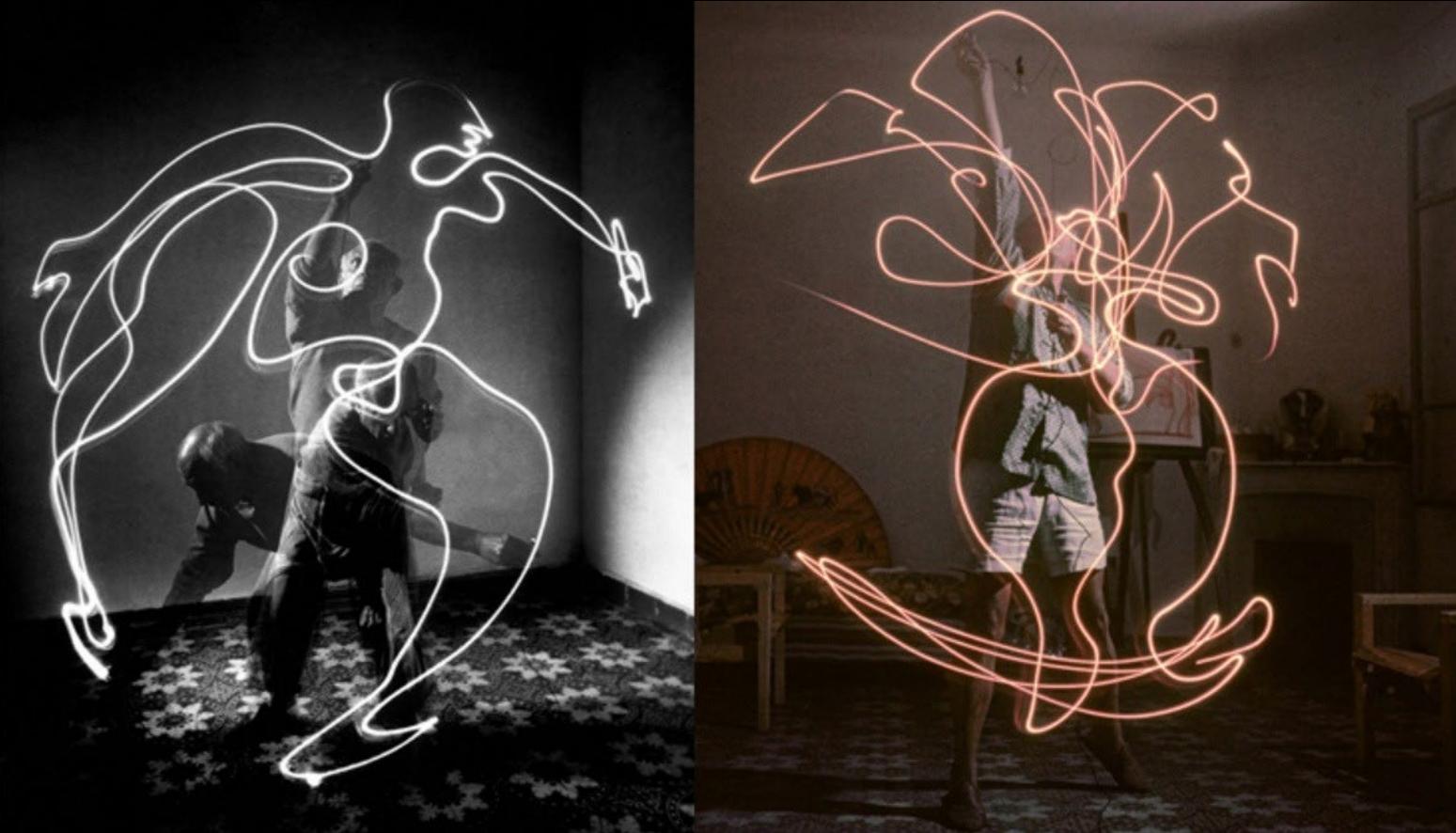
Agenda 11/10

- **Project 4: Drawing Machines**
- **Intro to Physical Computing**

Project 4: Drawing Machines

**Challenging the
act/concept of drawing**

Picasso Light Paintings (1950s)



Suda the Painting Elephant



<https://www.youtube.com/watch?v=foahTqz7On4>

AARON by Harold Cohen



L.A.S.E.R. Tag by Graffiti Research Lab



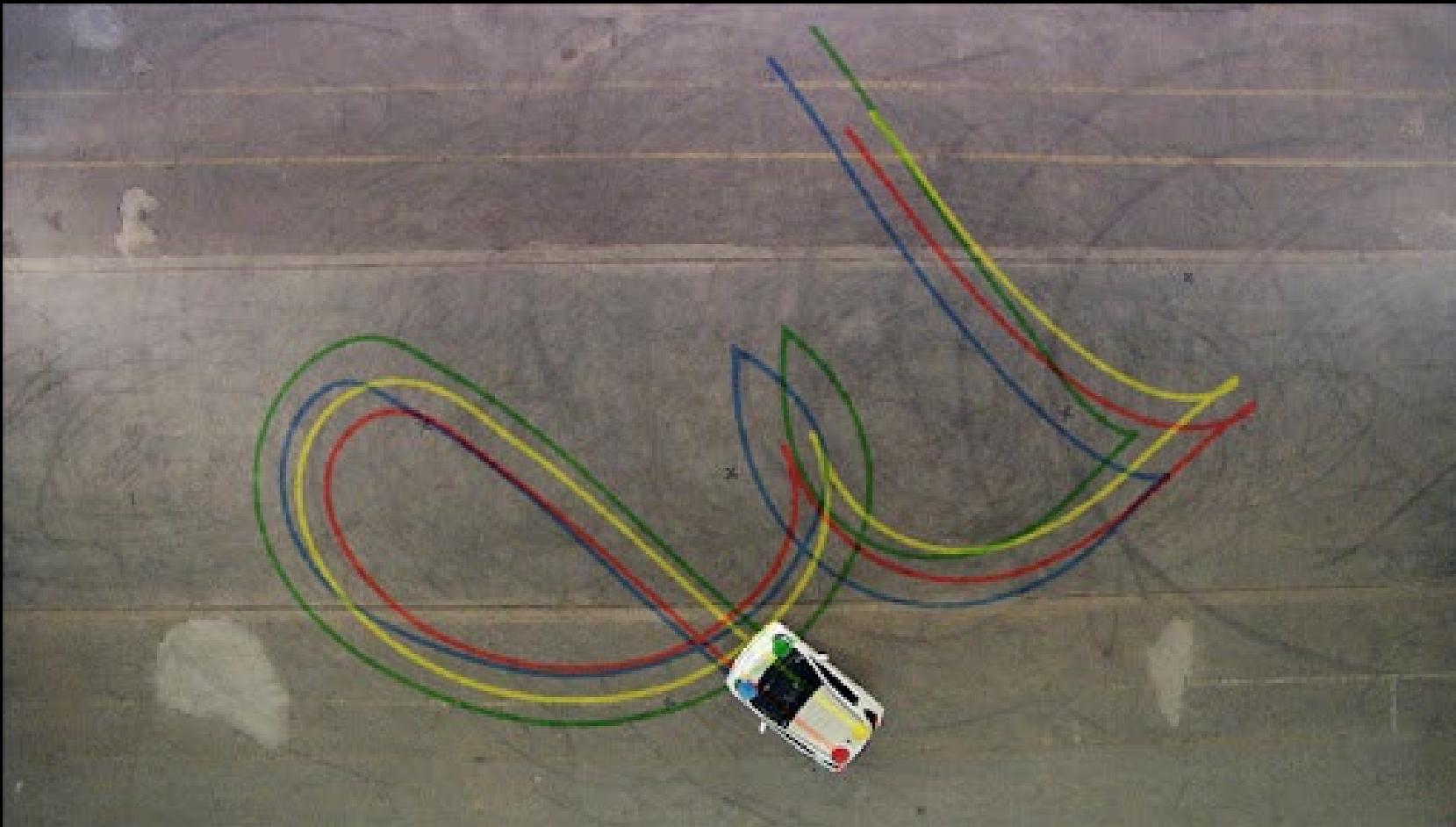
<https://www.youtube.com/watch?v=DKbtTPYZEig>

EyeWriter by Graffiti Research Lab



<https://www.youtube.com/watch?v=84H-xLrLvjk>

IQ Font (2010) by Zachary Lieberman



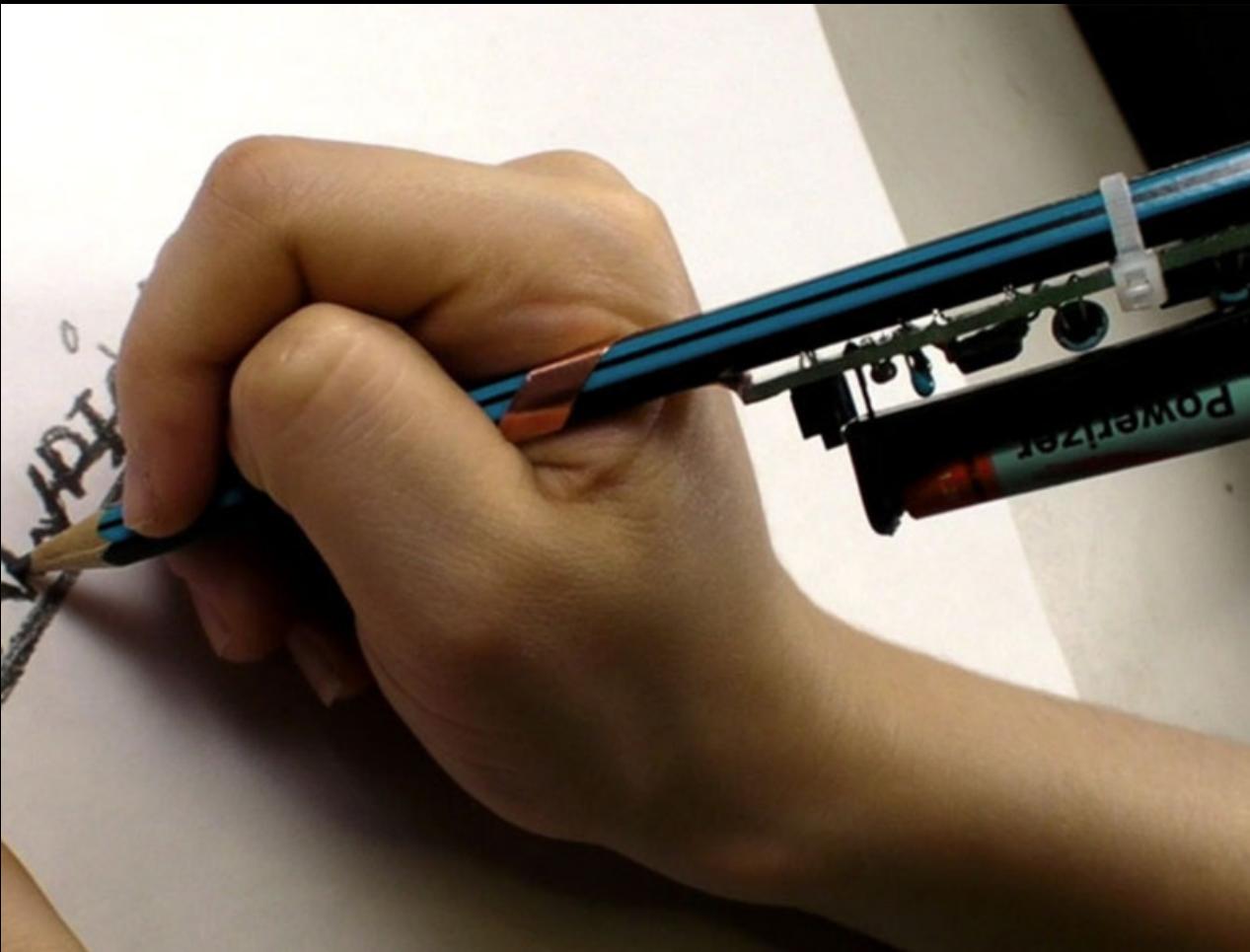
<https://vimeo.com/5233789>

Lightning Series, by Cassandra C. Jones (2011):



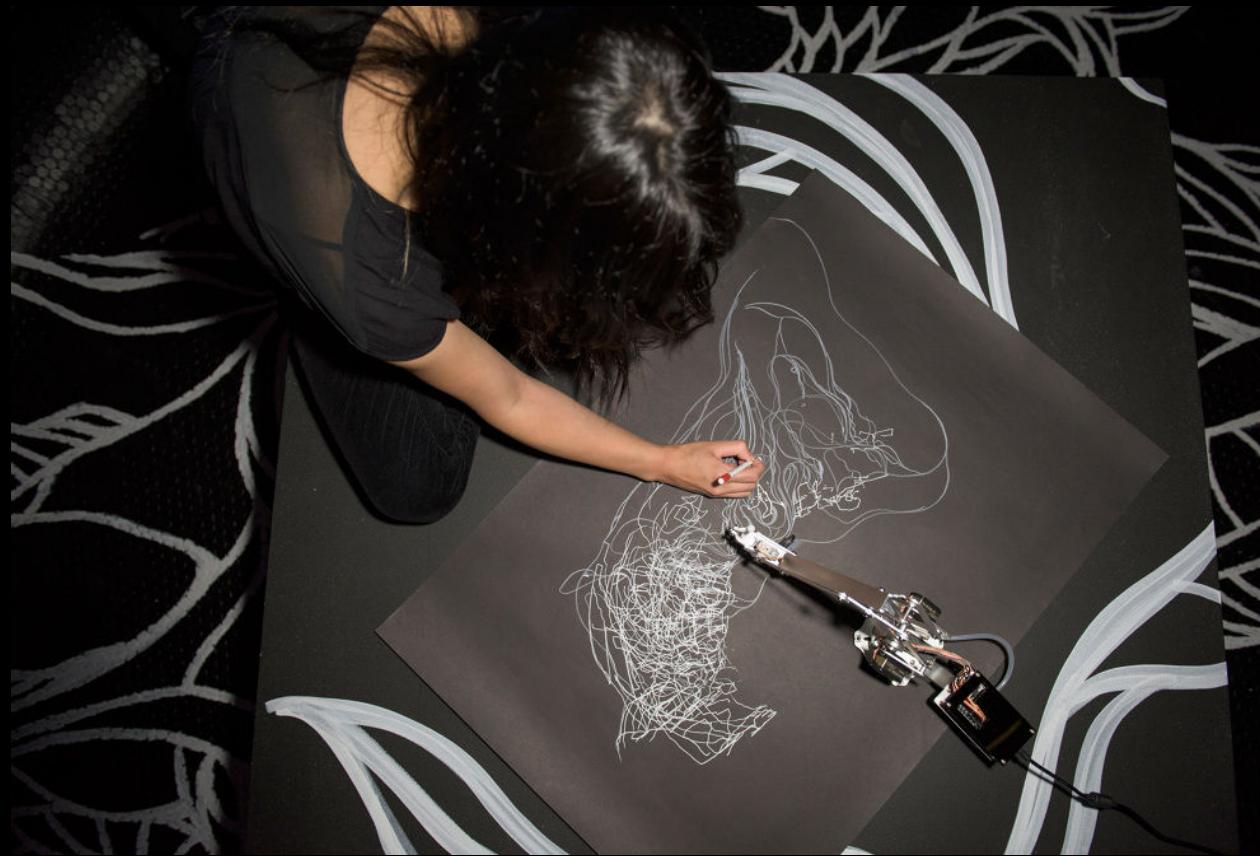
<https://www.cassandracjones.com/lightning-drawing-circles>

Drawdio (Jay Silver, 2008)



https://www.youtube.com/watch?v=PV_w38ldZaE

Drawing Operations by Sougwen Chung



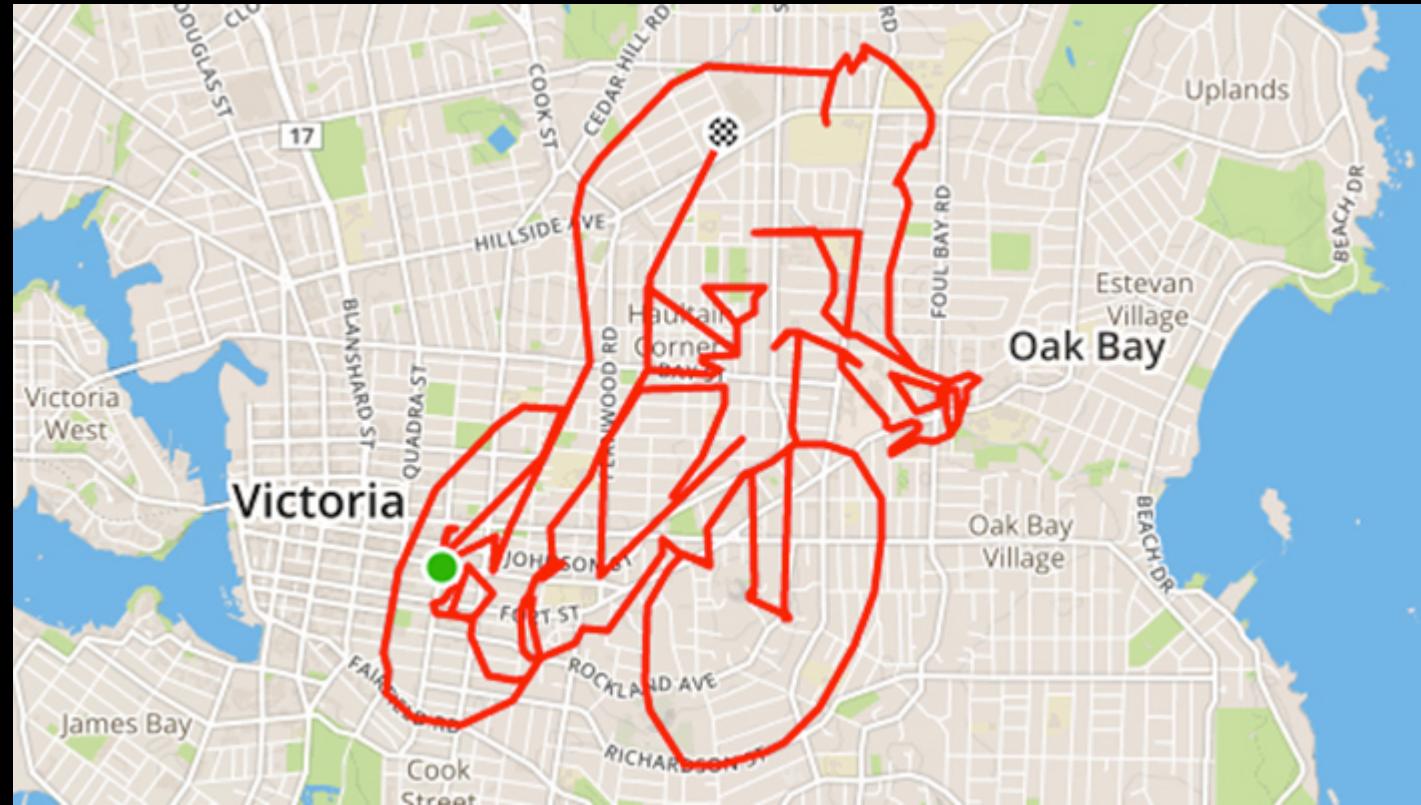
<https://sougwen.com/>

Senseless Drawing Bot (2012) by So Kanno & Takahiro Yamaguchi



<https://vimeo.com/30780208>

GPS Drawings



<http://www.gpsdrawing.com/gallery.html>

Graffiti Rainbow Bike (2012) by CROMATICS



<https://vimeo.com/47245840>

[Drone Drawing on Kendall Jenner](#) (2015) by KATSU



<https://www.youtube.com/watch?v=We12p6yvNW0>

Tree Drawings by Tim Knowles

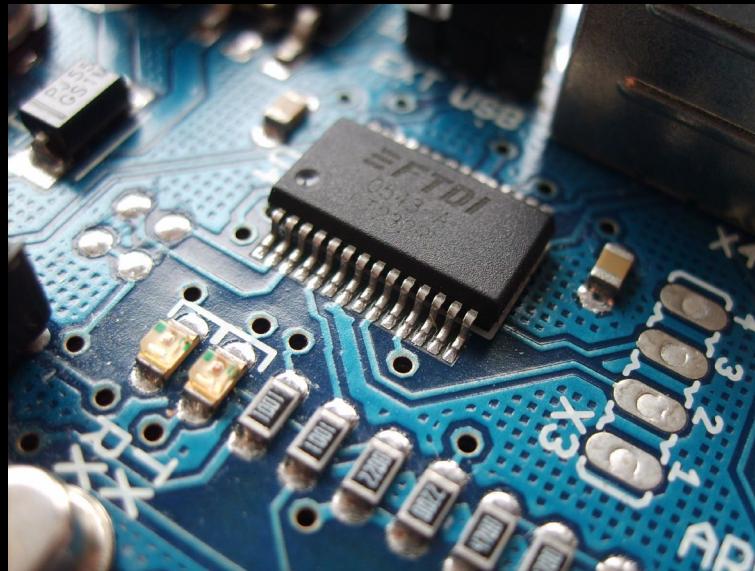


Metamatics by Jean Tinguely



<https://www.youtube.com/watch?v=4-NrTsq6bsg>

Physical Computing



Software



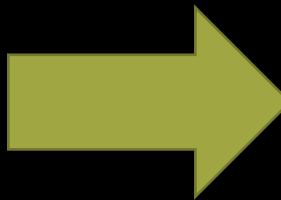
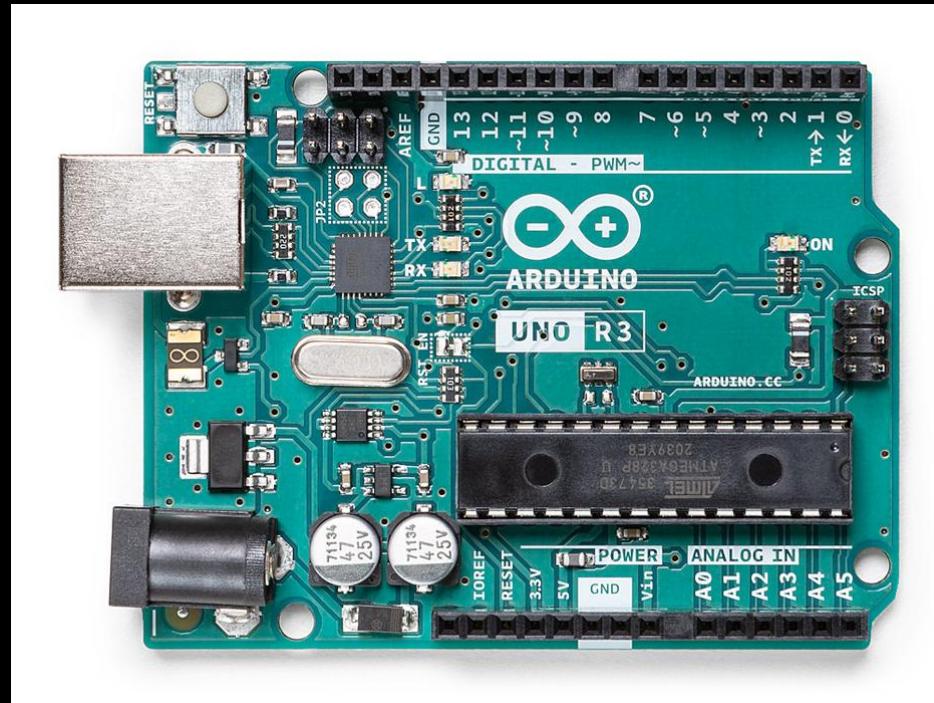
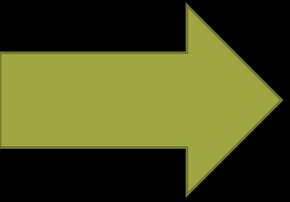
Electronics



Mechanical

Electronics

Inputs



Outputs

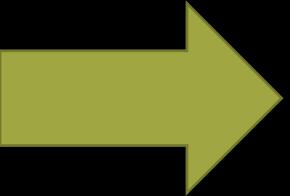
Arduino (Microcontroller)

Electronics

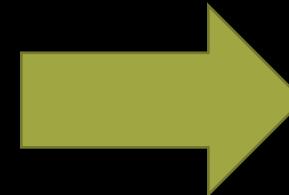
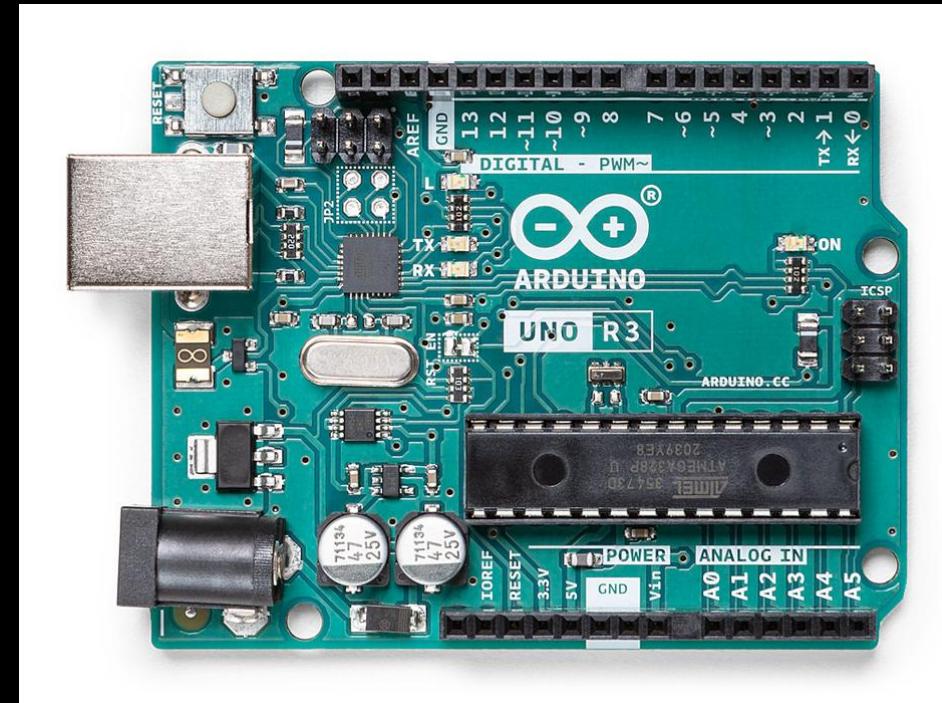


Electronics

Inputs



(SENSORS)

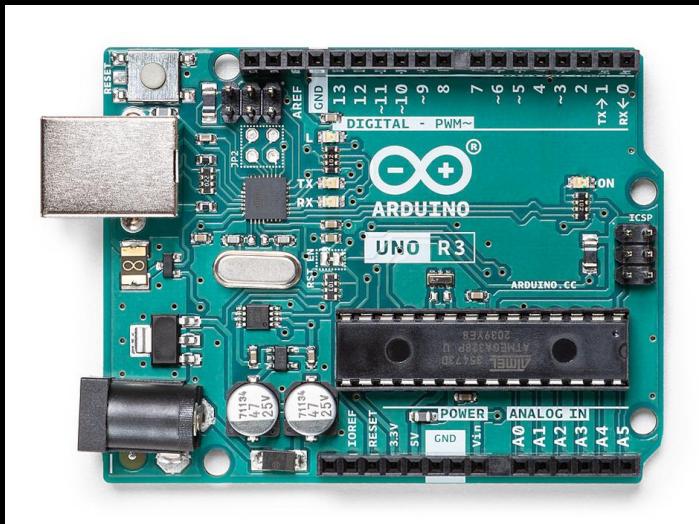


Outputs
(ACTUATORS)

Arduino (Microcontroller)

Arduino

Hardware



Software

A screenshot of the Arduino IDE interface. The title bar says 'Blink'. The code editor contains the classic 'Blink' sketch:

```
// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(LED_BUILTIN, HIGH);    // turn the LED on (HIGH is the voltage level)
  delay(1000);                      // wait for a second
  digitalWrite(LED_BUILTIN, LOW);     // turn the LED off by making the voltage LOW
  delay(1000);                      // wait for a second
}
```

The status bar at the bottom shows 'Arduino Nano 33 BLE on (devtools/nano33ble-1.6.1)

Community

<https://www.arduino.cc/>

Servos (Actuator)



Servo: 180 or 360 type

Cost of Electronic components

Arduino - \$15.00

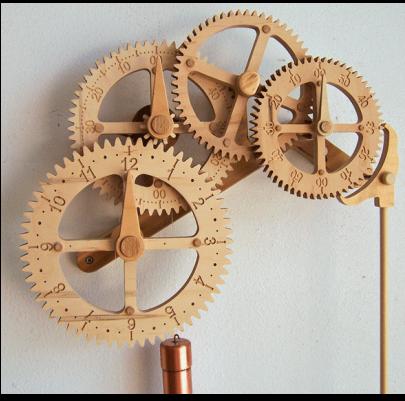
180 Servo - \$5.00

360 Servo - \$7.50

Mechanical Construction



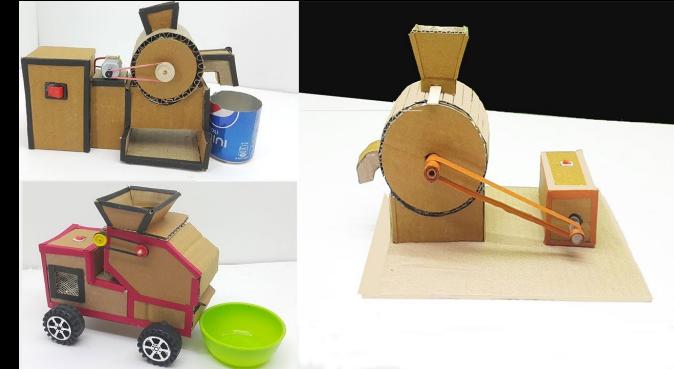
Metal



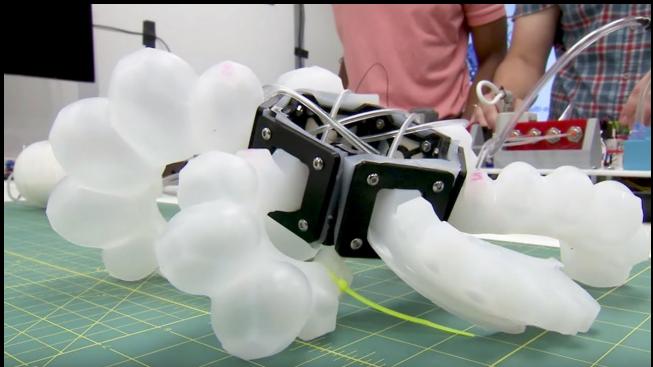
Wood



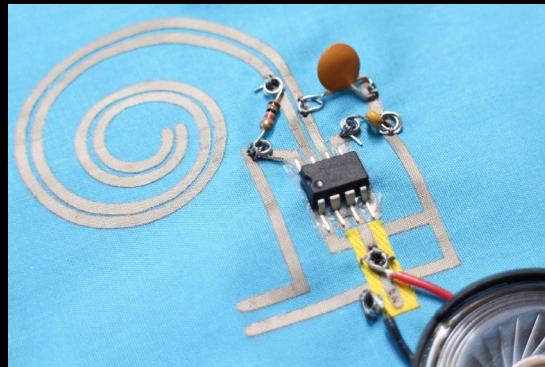
Acrylic



Cardboard



Soft Materials



Fabrics

Variable cost for physical parts and construction

Homework

1. Review:
 1. <https://drawingmachines.org/>
 2. <http://www.papermech.net/learn/>
2. Sketch ideas for Project 4