

ANGEL EYE

ROADWAY GUARDIAN

Angel Eye makes road intersections safer for all road users by spotlighting danger areas.

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The Massachusetts Institute of Technology
Integrated Design & Management

Making roadway intersections safer with collision forecasting

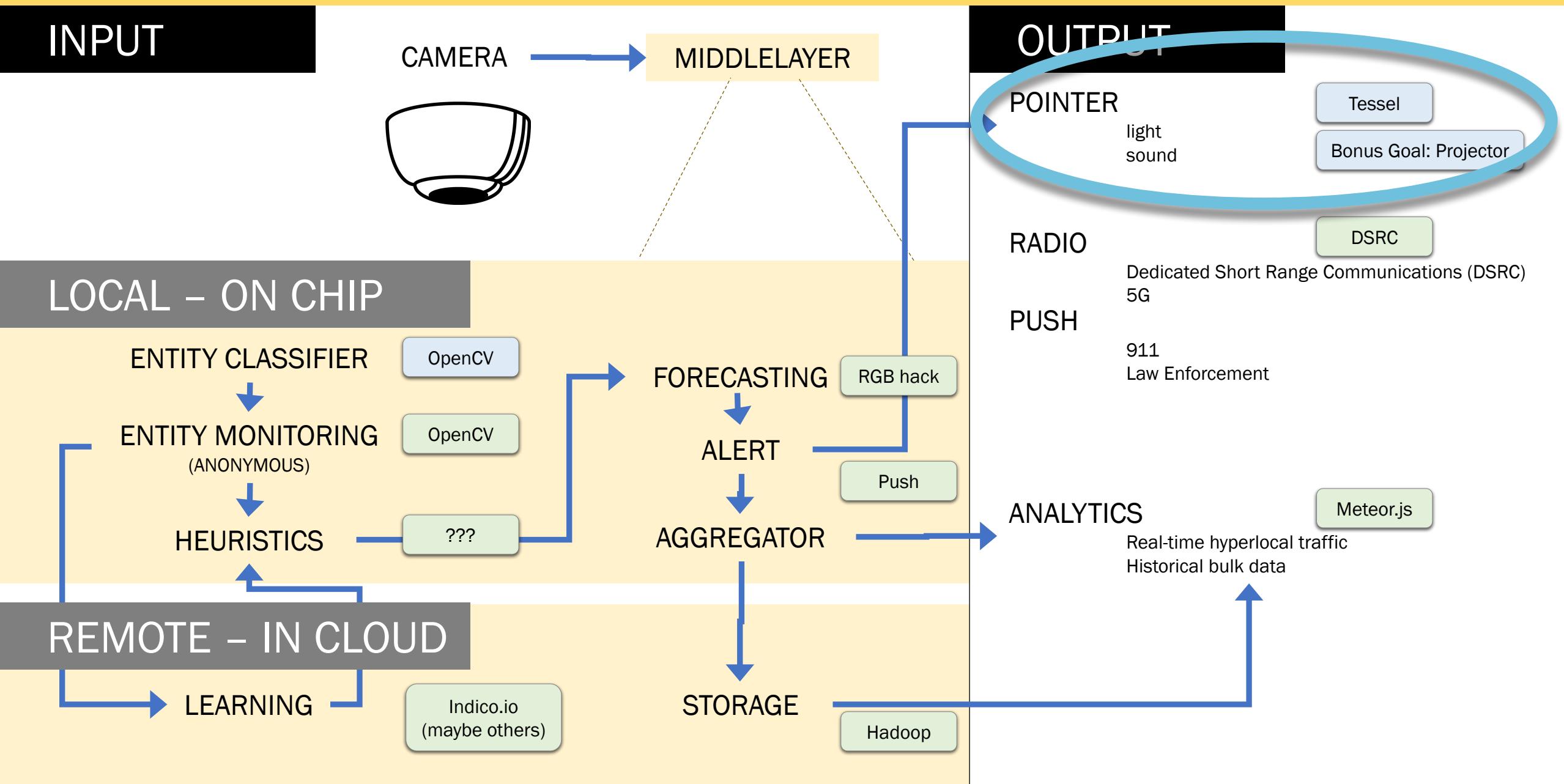
Problem

- Danger zones: Intersections
- Low levels of awareness between road users

Solution

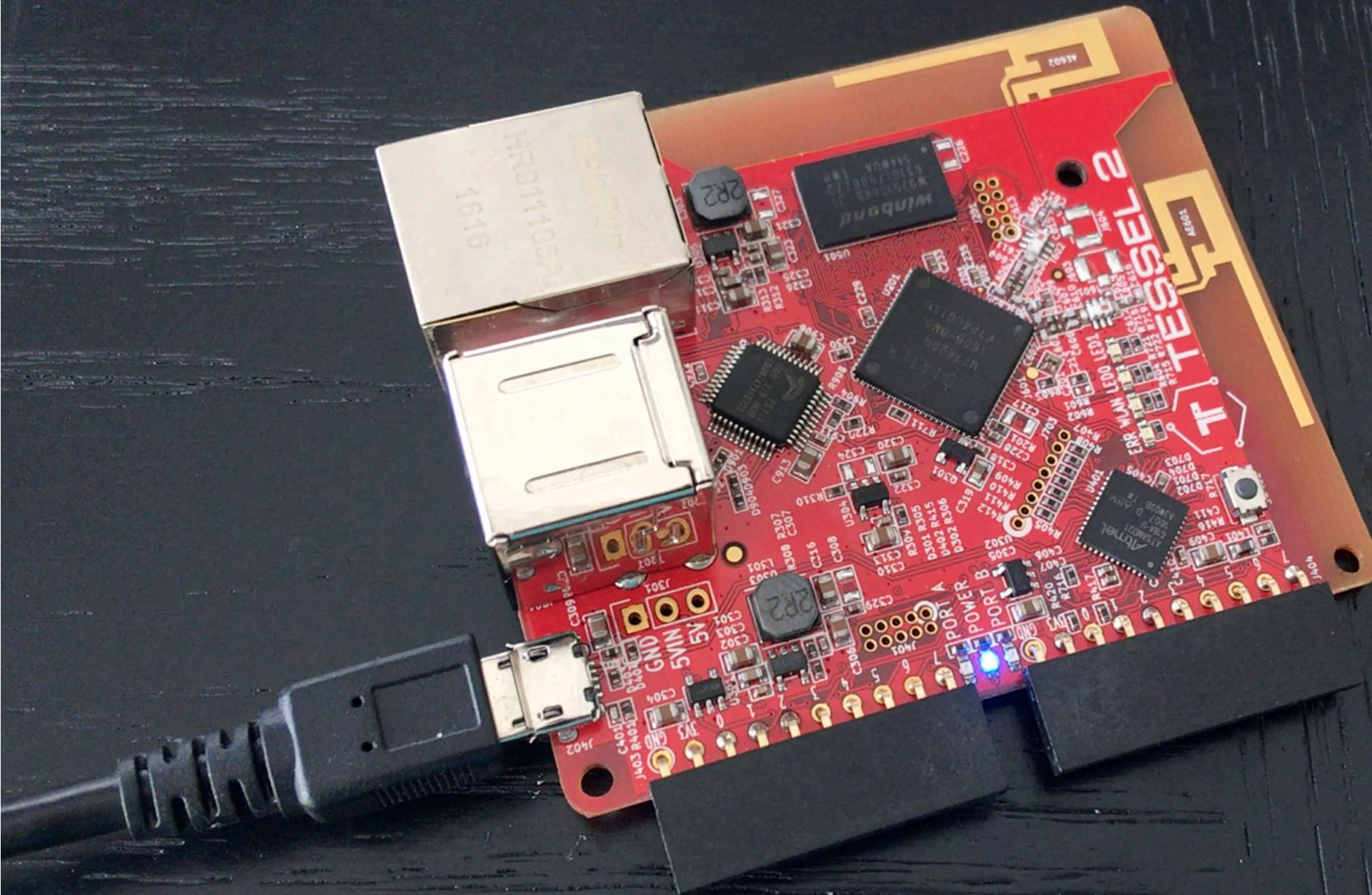
- Middleware Platform for day and night alerts
- Independent of users' technology level
- Focus on intersections

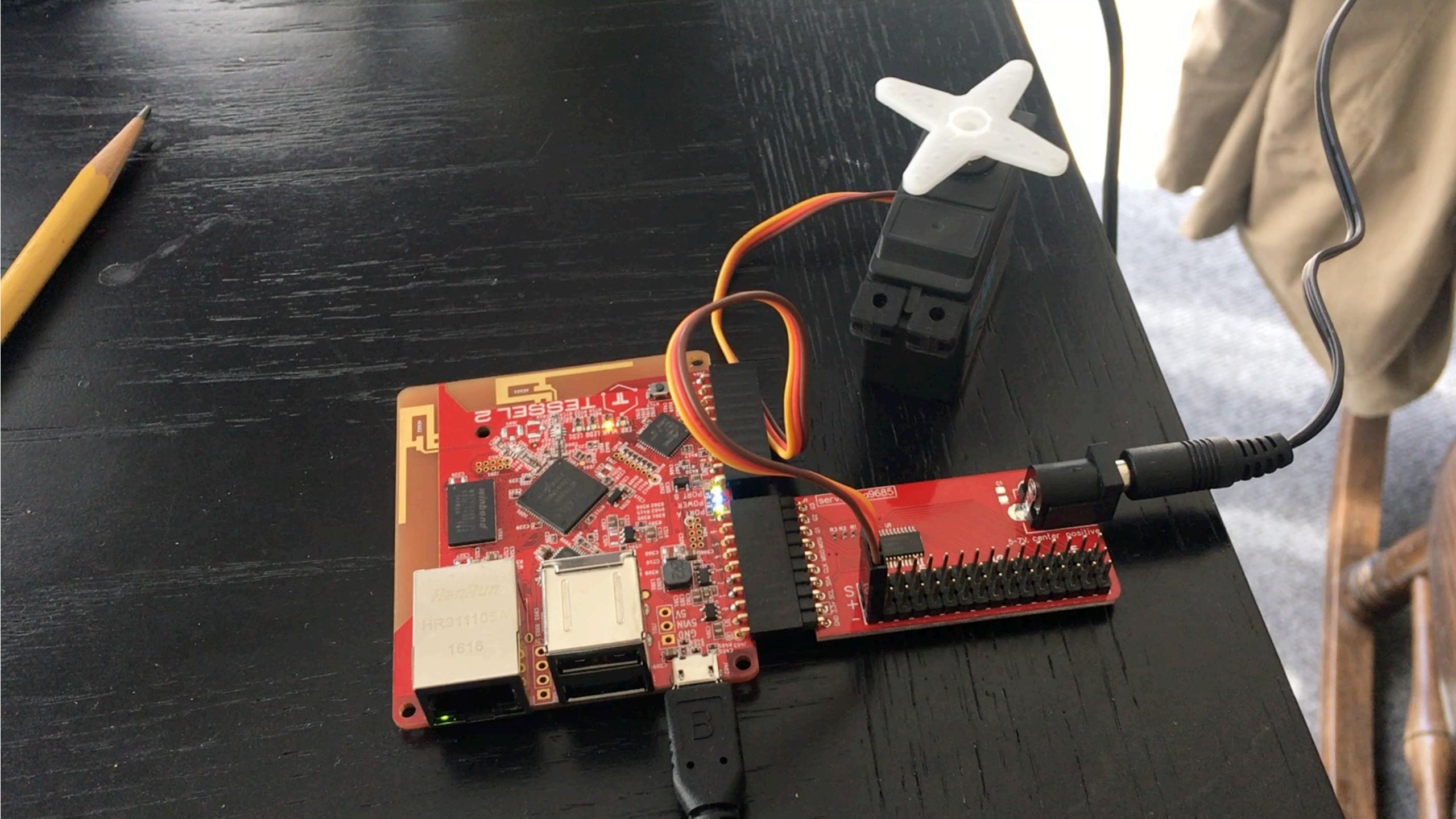
Technology Map: From solely camera input, we can unearth actionable data and provide collision mitigation

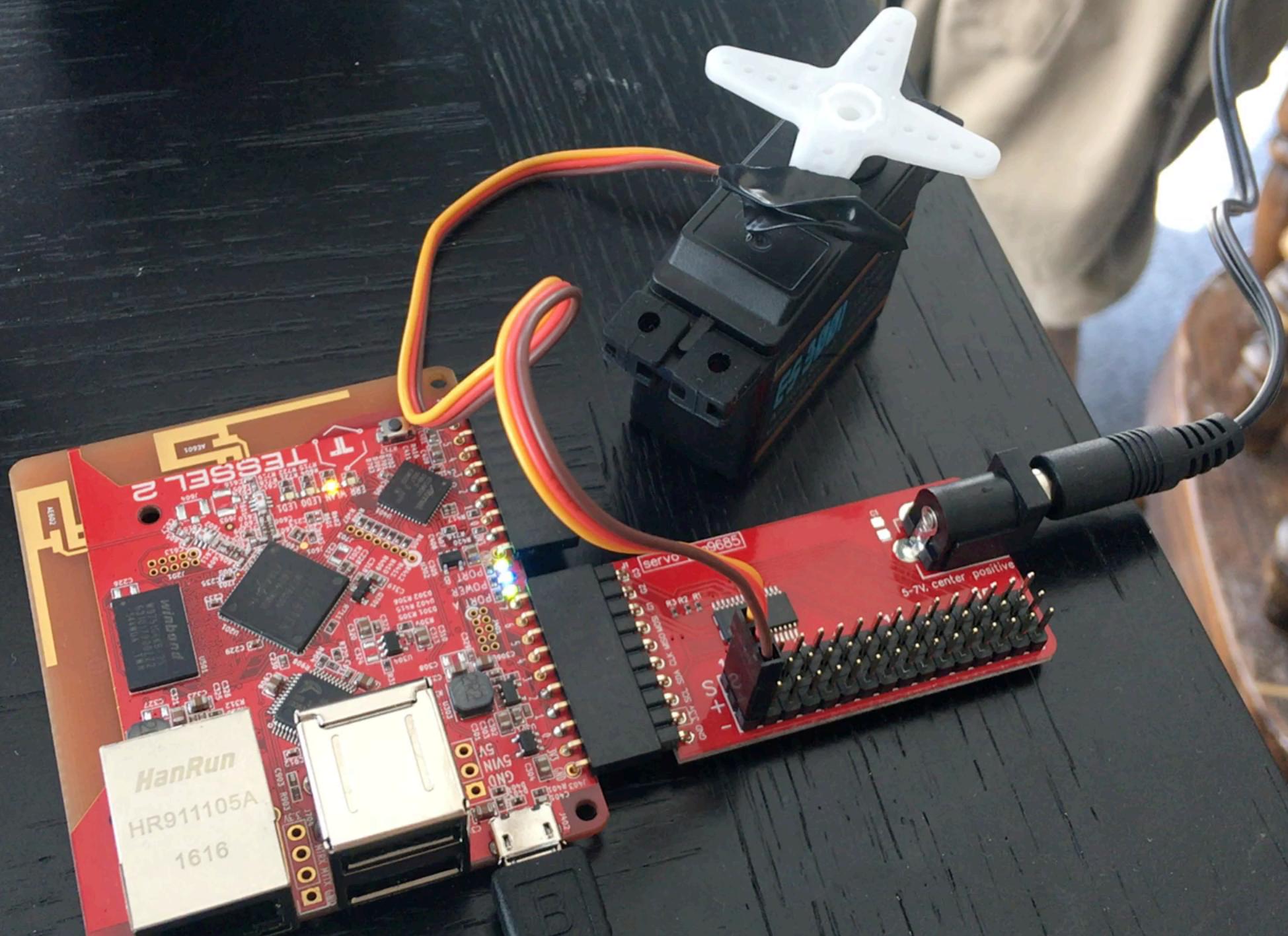












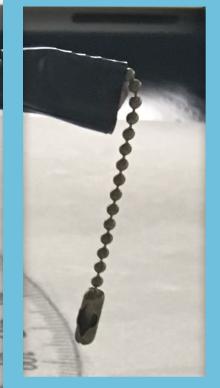
pencil



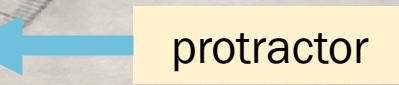
Servo



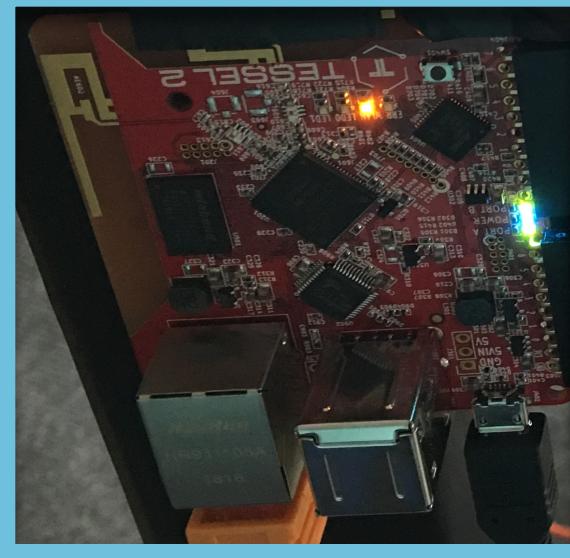
Plumb bob



protractor

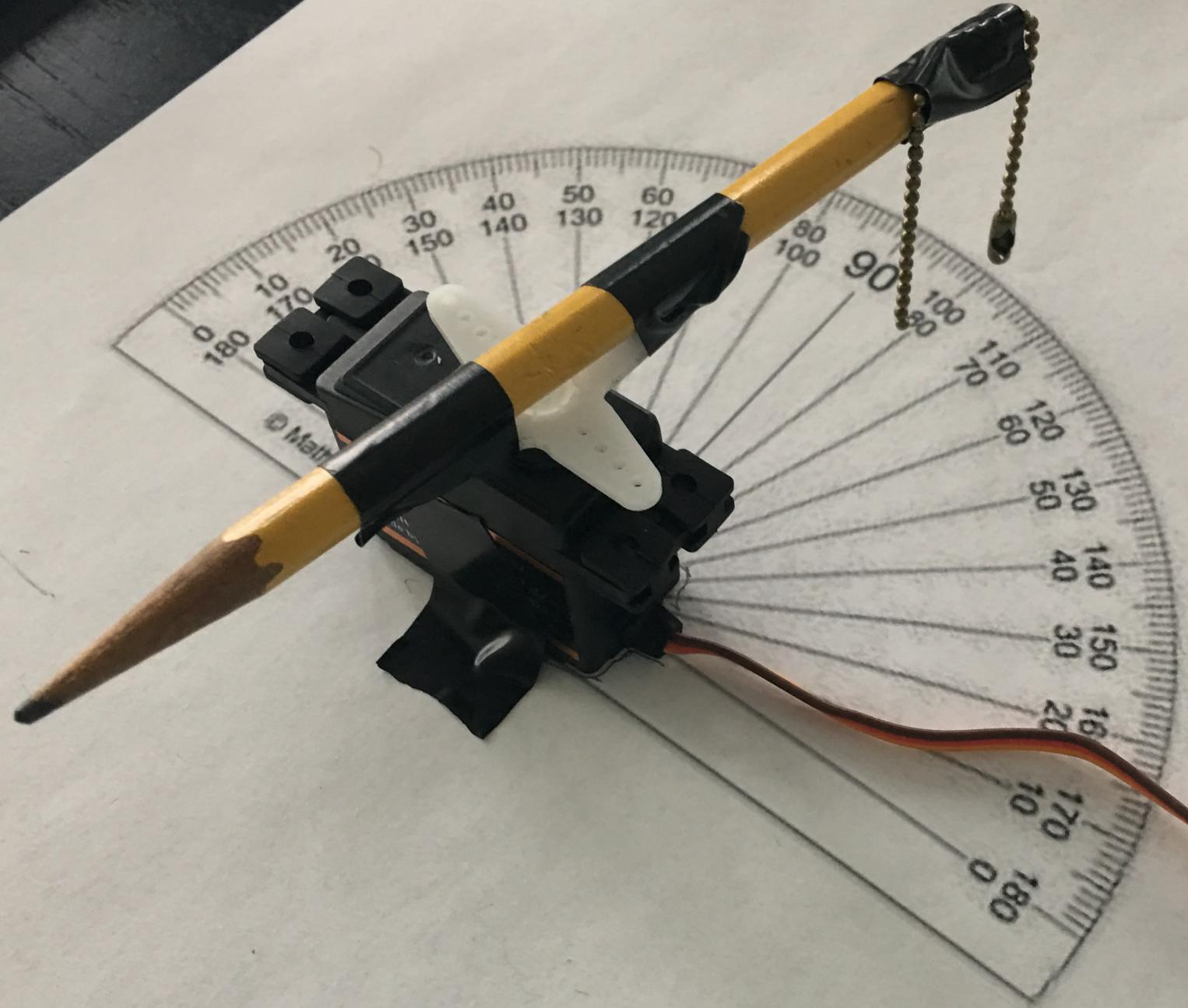


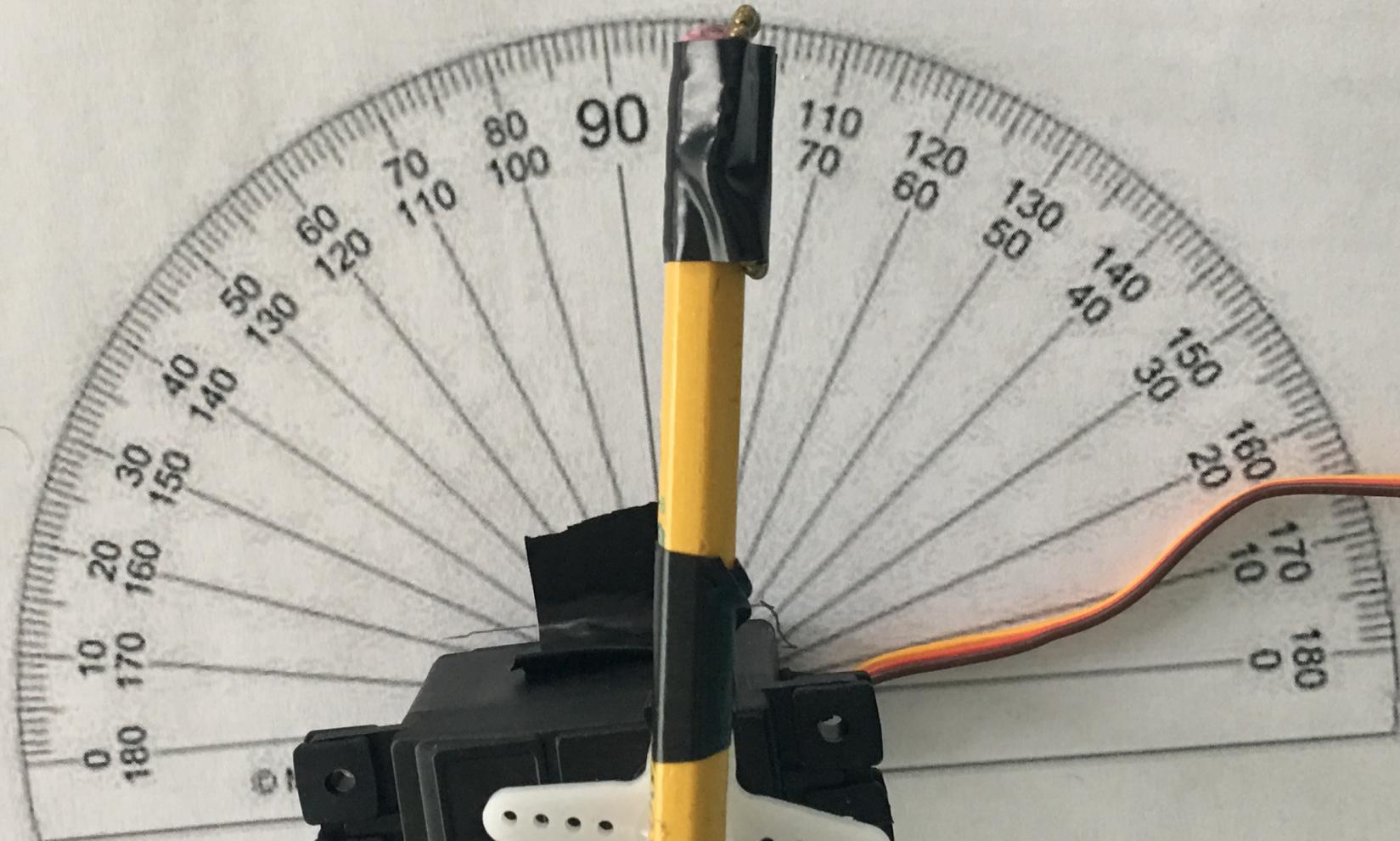
Tessel board

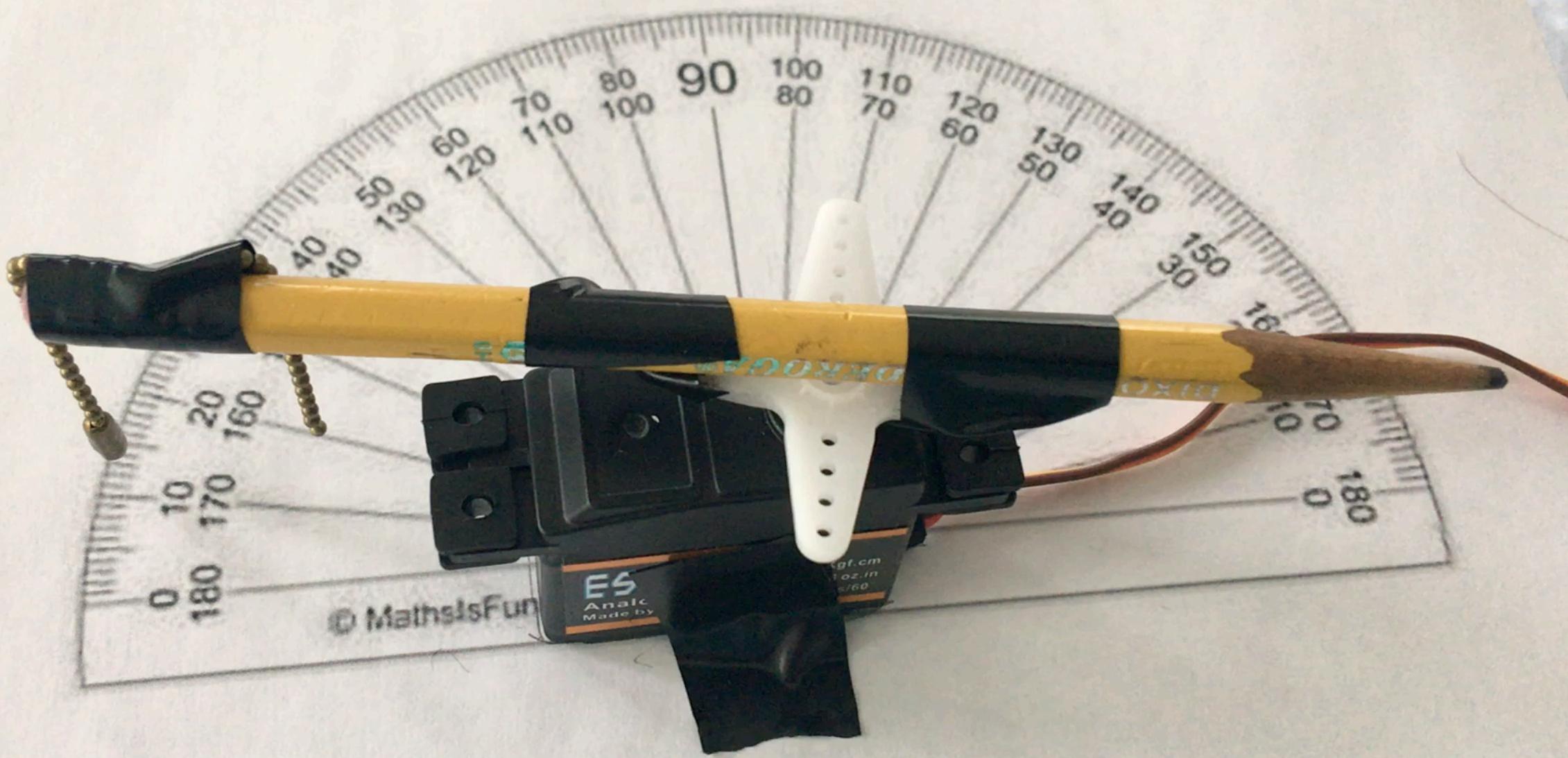


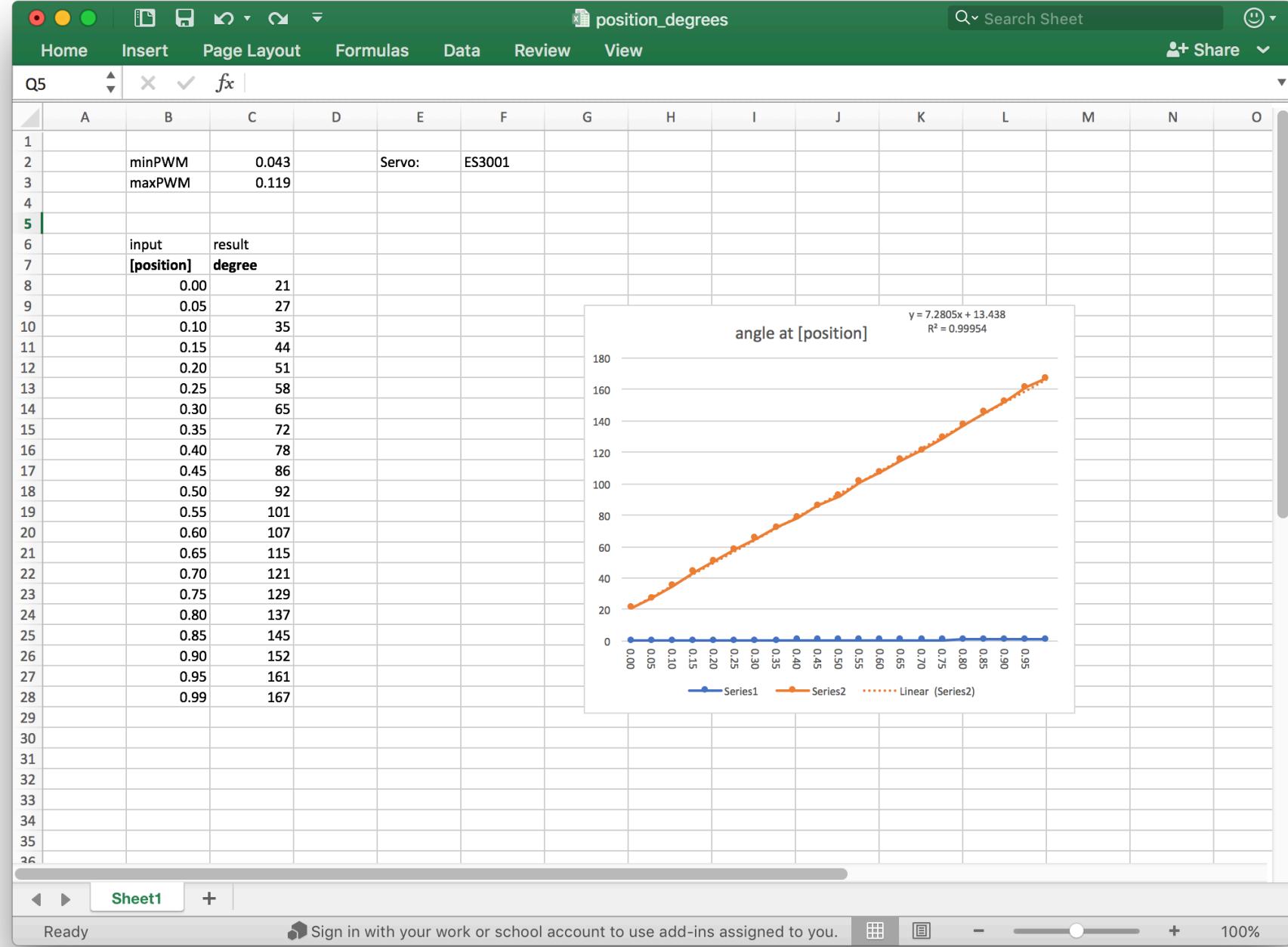
Servo board



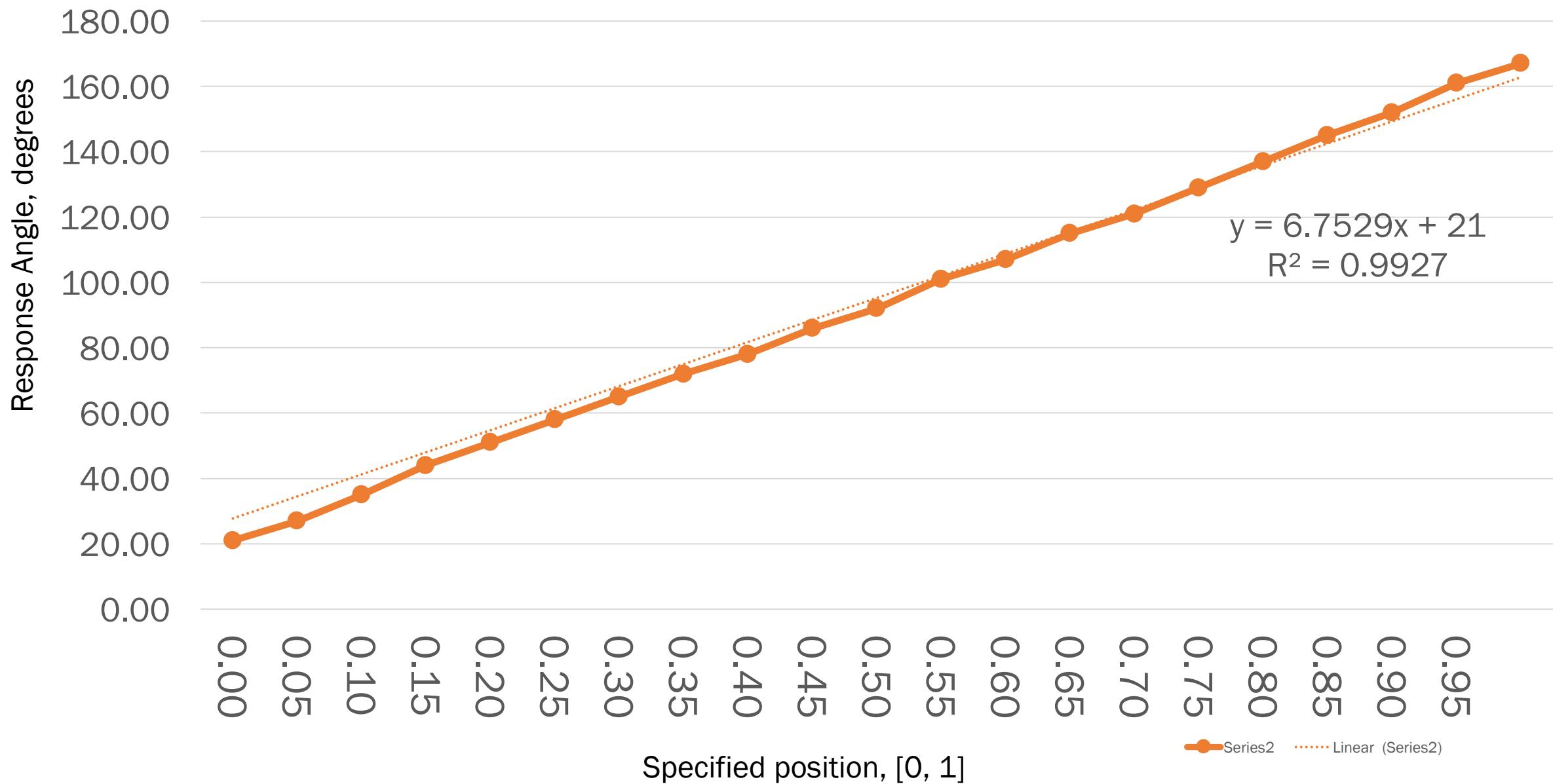




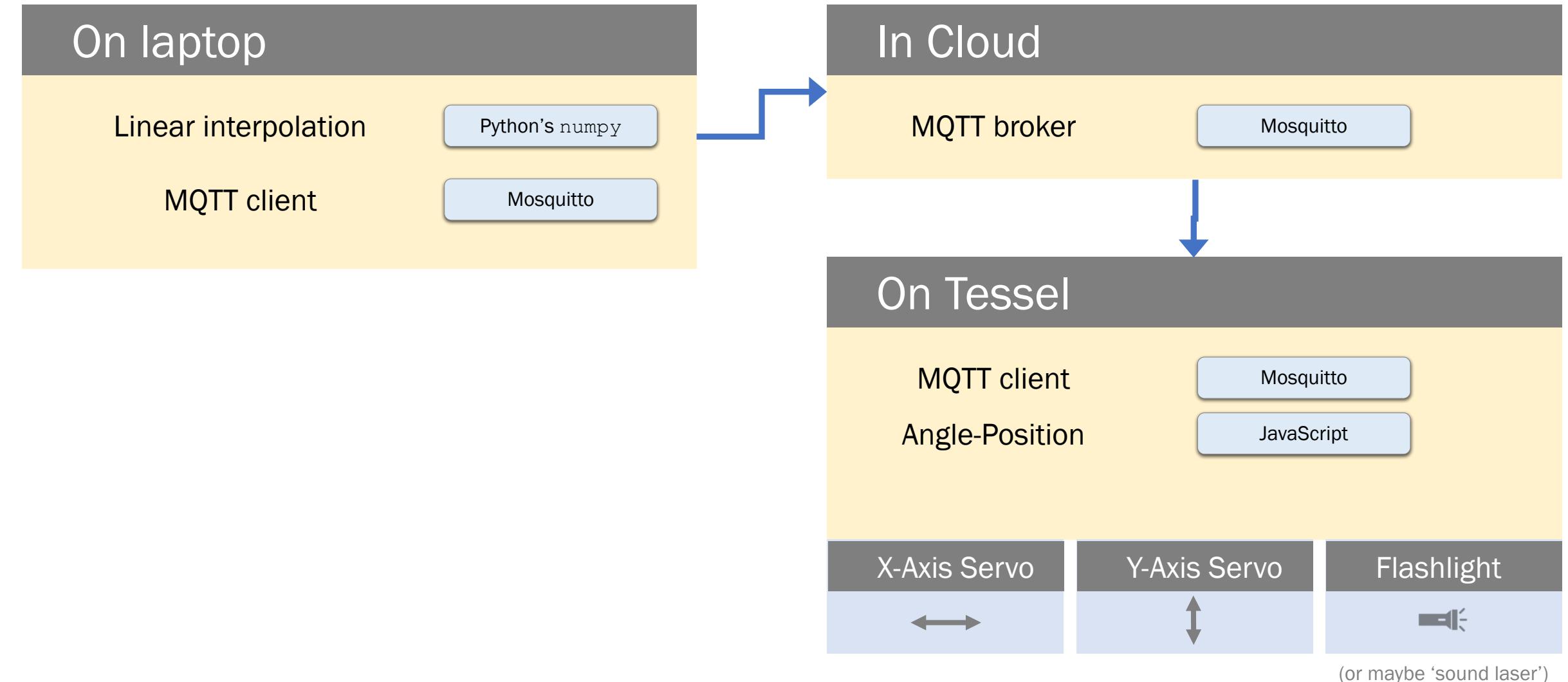




For a given [position], what is the resulting [angle]?



Data flow map



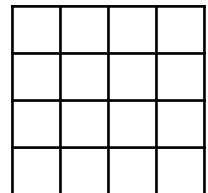
The *if...then* of project risks

if

2-axis gimbal math is too confusing

then

Hand-calibrate via projected coordinate grid
Use 2-dimensional interpolation table (via Python's `numpy` module)



Digital Ocean MQTT server too laggy



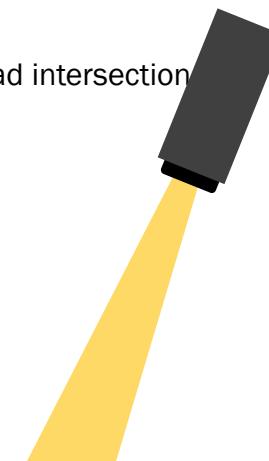
No real-time data stream

Run server locally
Use *Mosquitto* messaging broker

2-axis gimbal fails or I have more time

Produce realistic but pre-baked data stream over MQTT
Even with hardcoded data, the turret will still behave as if it's real data.

Use projector to 'spotlight'
Use `Paper.js` to project color vector artwork onto scale model of road intersection surface.



Next Steps

COMPONENT	TASK
1. 2-axis gimbal	Perform dual-servo calibration with grid
2. Live data stream	Setup MQTT messaging queue
3. In-person Demo	Script the in-person demo for class
4. (bonus:) Projection	Make animated vector art with Paper.js

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