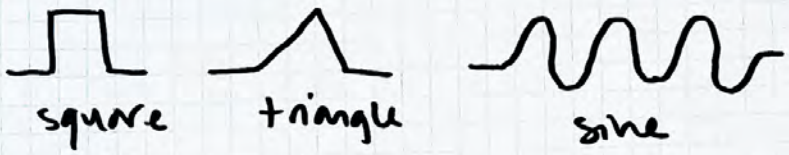
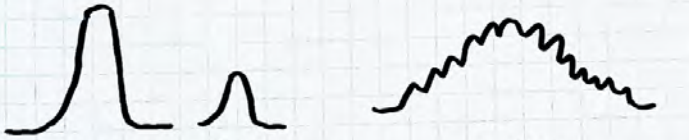
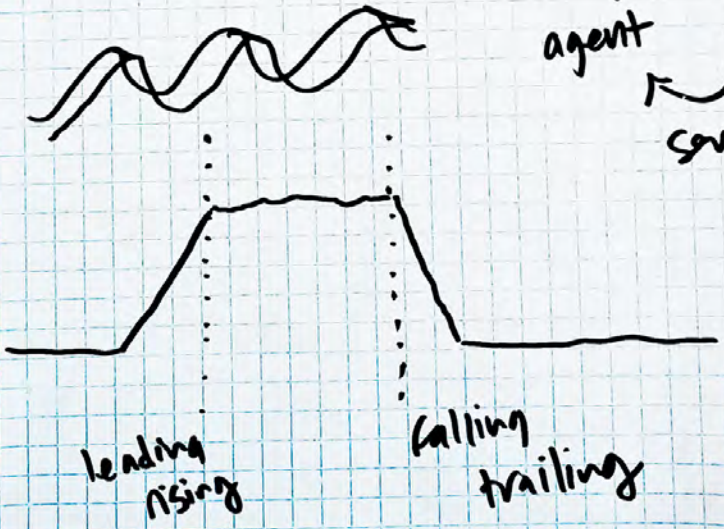
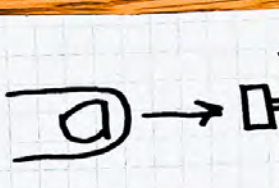
COGS 300 Movement 01 Jan 13/26

Warm up: Draw waves. Vary size, shape, width, etc.









mechano receptors

if you switched would pressure feel like tickle?

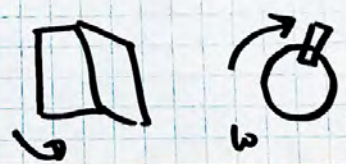
0.5 medium

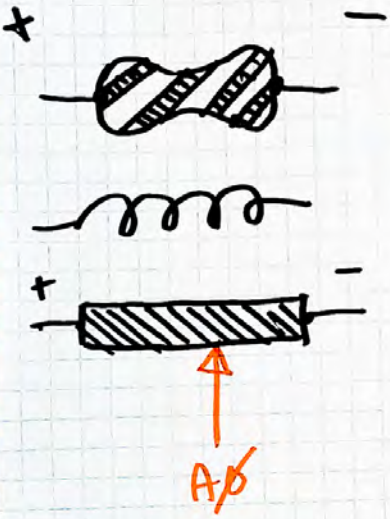
Ranges:

0 − 1 (Lo Hi) discretized into

0 − 255 ↔ 0 − 100% 1% inc

0 − 1023

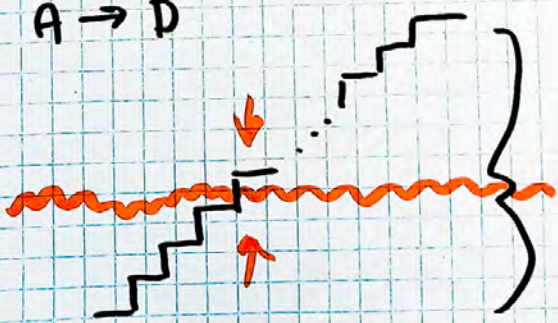




★ Build pot circuit

Model analog circuit

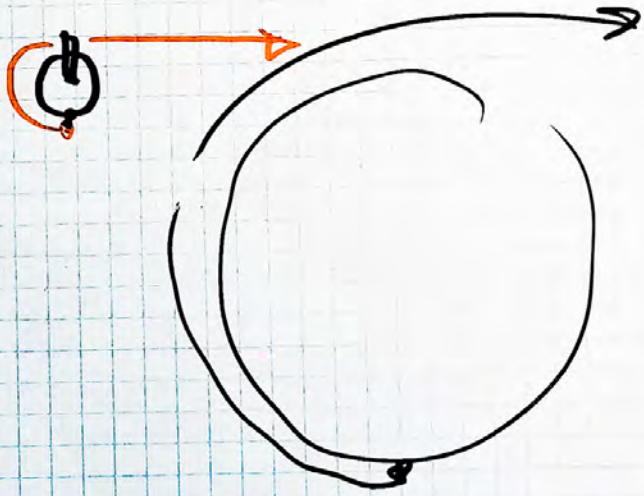
A → D



comparator
op-amp

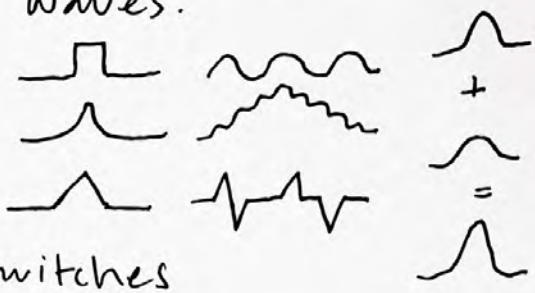
☆ Make a distance sensor using materials from your desk.
"paper prototype"

Reflection: Is the human body digital or analog?

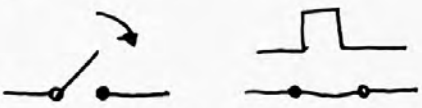


Movement 01

Warmup: Waves.



Last time: switches

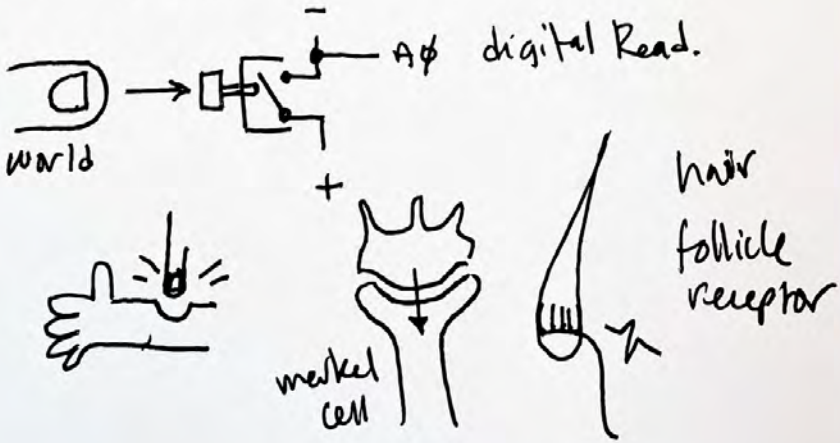


pulse.

This module is about movement.

agent ⇄ world (act / sense)

At minimum, an agent must act on the world. But to act, it must sense.



Thought experiment: if you could magically switch all Merkel cell + follicle wirings, would pressure feel like tickle?

☆ DC: Build a signaling device.
Transmit ~~numbers~~ numbers.
Use only Arduino for signal gen, but a human can "look."
Think thru protocol + encoding.

These are digital signals.

Hi / Lo on/off
T / F
1 / 0

But clearly, we have ranges:
0 – 0.5 – 1.0 0 – 100.
0 – 1023 ~~0 – 100~~
0 – 255 ← ☆ notice anything?

In the real world, things are rarely on/off. We have to really force them into on/off.

door: open or closed.

... but I half-close my door all the time.

half-locked door.

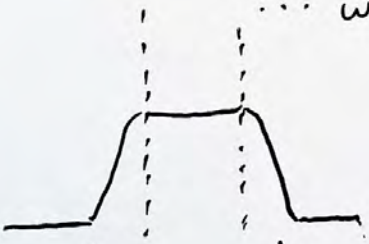
but also:

← today.

Lo Hi

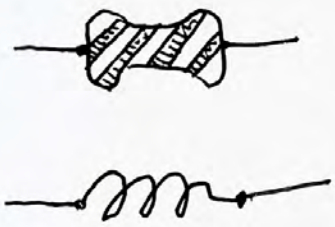
Vol.

Analog: varying in a range.
continuous.
"infinite" precision
... well not really.

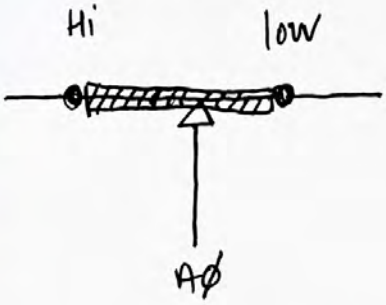


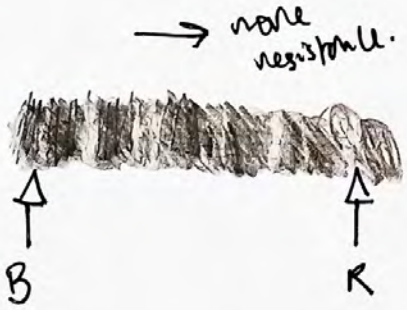
↑ ↑ trailing or falling

Remember our resistor?



just a coil of resistive material





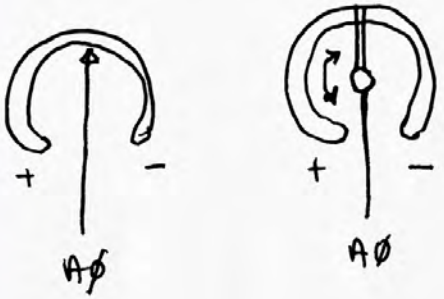
We just made a distance sensor!

☆ How? analogRead(AØ);

now:

Wrap the resistor around a circle:

Stick a proble on a spinning thing:



and you've got a potentiometer.

★ Show demo. + Book. + obj's.

Look round you. How many knobs are in your world? Some will be switches. Some will be pots.

Any analog sensor can be modeled conceptually by a pot.

flex   photo.

pressure 

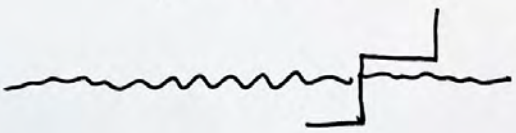
once you "get" pots, you're able to understand + design w/ any analog sensor

★ Build your pot circuit.

Reality inside: analog → digital

1	2	3	4	5	6	7	8
2	4	8	16	32	64	128	256
					512	1024	
					2^9	2^{10}	

10 bits of precision.



* Brainstorm UIs w/ knobs + switches.
paper prototype.

Reflection: does body do digital or analog?
or A → D?