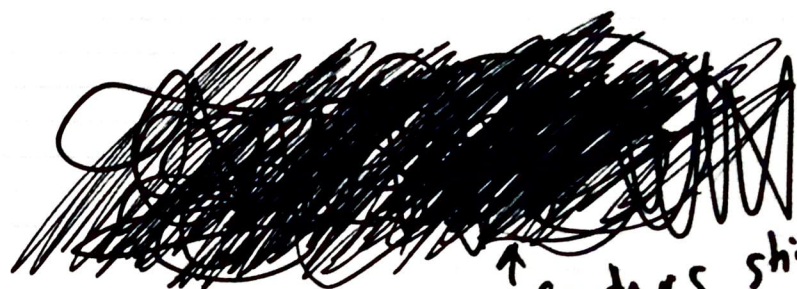


L03 - Actuation

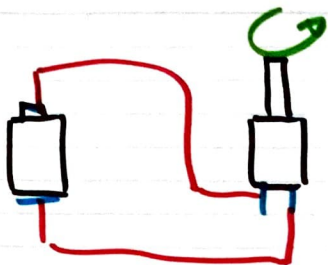
mindful exercise: Scribbles.

Find a big, repeatable motion by scribbling. Analyze your biomechanics. What muscles move? Bones?



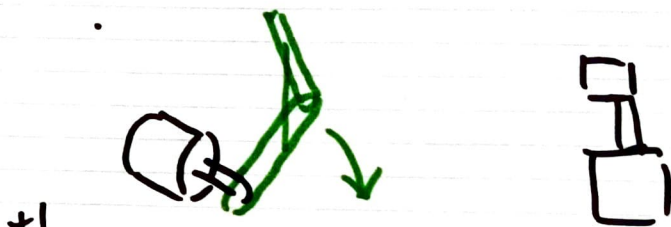
- swinging my forearm.
- shoulder 7.77.

- ↑ fingers shift
- wrist slight motion
- arm slight motion
- little twist
- elbow out.



flipping polarity $\rightarrow$
motor turns
in reverse.

• what else can a motor do?



+

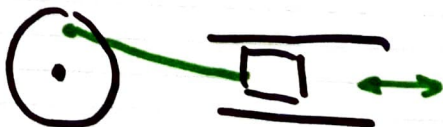
-

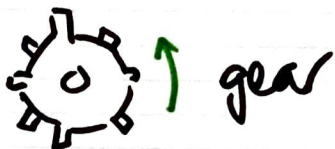
wheel



piston

slow down /
speed up

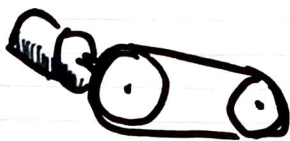




gear



fan



pulley



• Simple machines



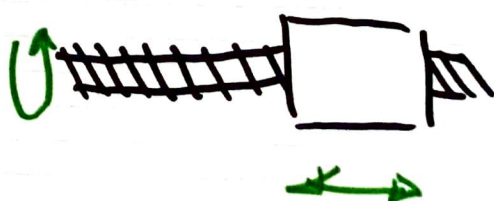
wedge



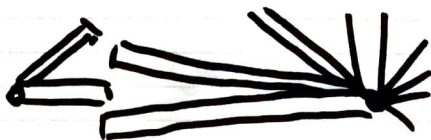
Force vs. distance.



worm drive.



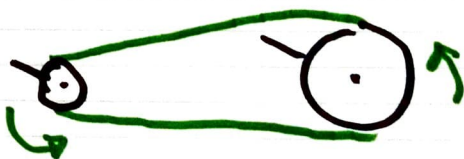
- gen is like a lever



ft. lb

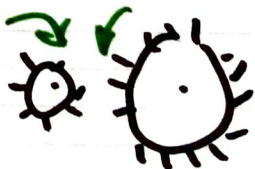


- gen is like a pulley

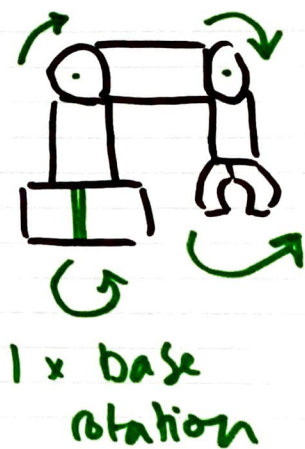


5 : 1

ratio



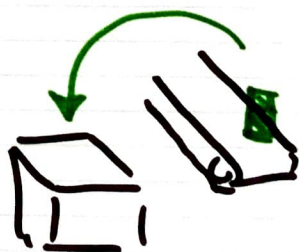
- Many DC motors
- each motor corresponds to a degree of freedom (DOF)
- one motor means one DOF



2x arm rotation

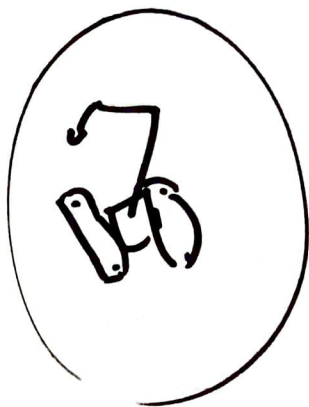
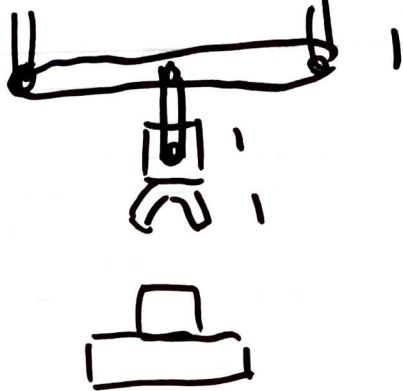
1x end effector rotation

1x open/close claw



⇒ Design a "pick and place" robot

pay attention to DOF and simple machines



drift



aft

How do you design a
wheel that knows its
own position? Angle?
of rotations

- embodiment
 - cognition "in the body" and "in the world"
 - emotions → seems obvious.
 - why?
 - embodied therapies work
 - information in the configuration of the body
 - world has info too
- Searle
 - Canuch Place as example of clear, intuitive communication based on embodied action
- cartesian viewpoint is "cognitivist"
- artists as having embodied knowledge
- machine as metaphor
- is cognition encodable?