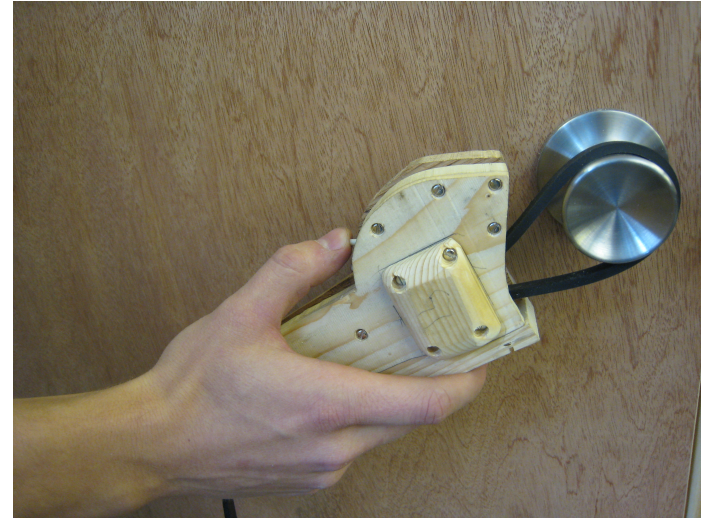


# Knob Handler



## Team Yellow B

Brentan Alexander, Phillip Dawson, Harmeet Gill, Moneer Helu,  
Dave Lopez, Zack Reynolds, Jin Xu

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# Objective

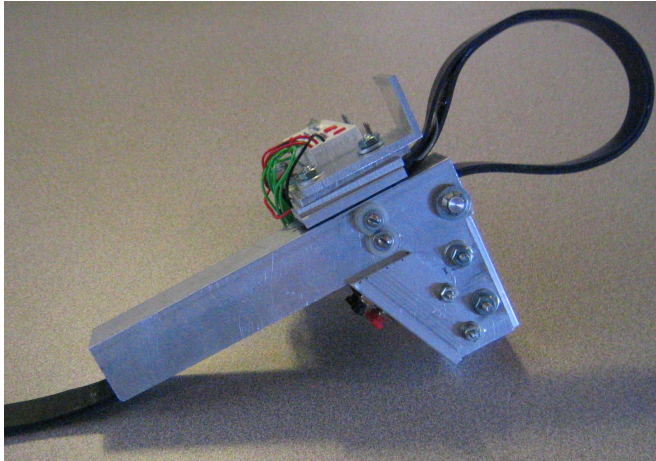
- To aid those with limited strength and/or dexterity in gripping...
    - Door knobs
    - Jar lids
    - Sink faucets
    - Etc.
-

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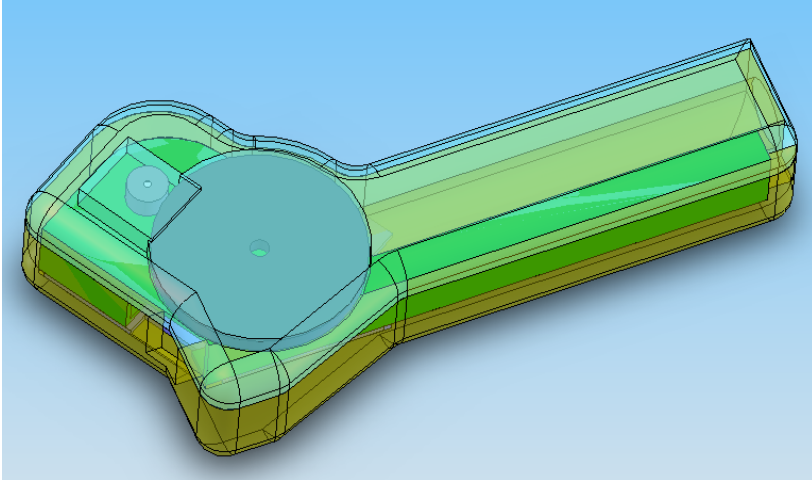
# Customer Needs

- Flexible
  - Portable
  - No stigma attached
  - “Invisible”
-

# Purpose of Mockup



- Sketch Model
  - Function over form

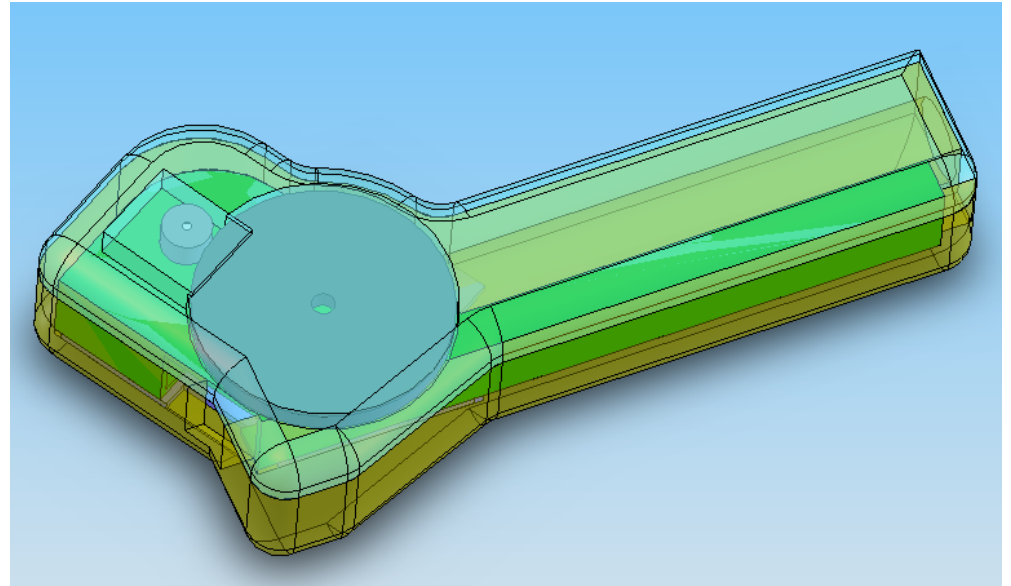


- Mockup Model
  - Form over function



# Critical Requirements

- Compactness
- Form
- Low cost



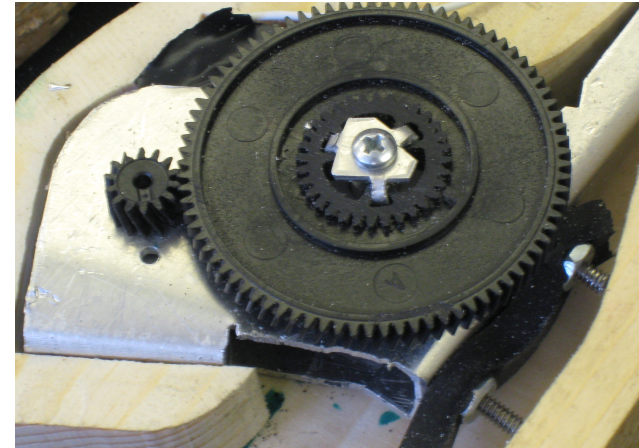
# Compactness

## ■ Actuator

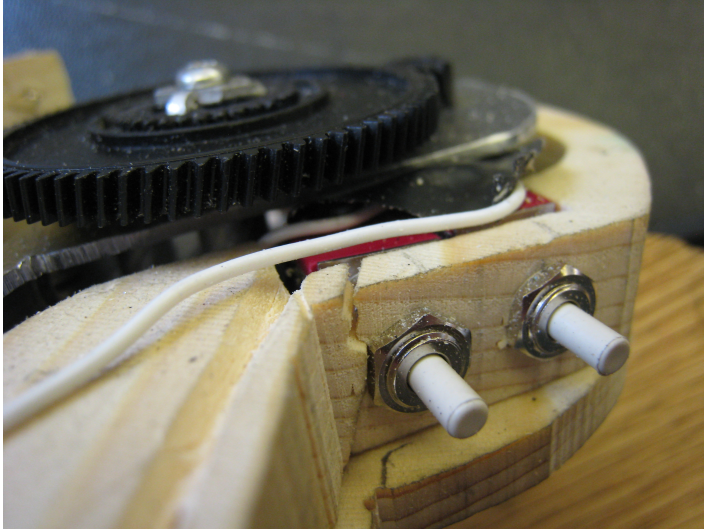
- Miniature DC motor or linear actuator
- Measured torque-speed curves
- Design Selection: Mitsumi R 142021 DC Motor

## ■ Drivetrain

- Gears or leadscrew
- Estimated gear reduction
- Benchmarking
- Leadscrew model
- Design Selection: Spur gear drivetrain



# Form

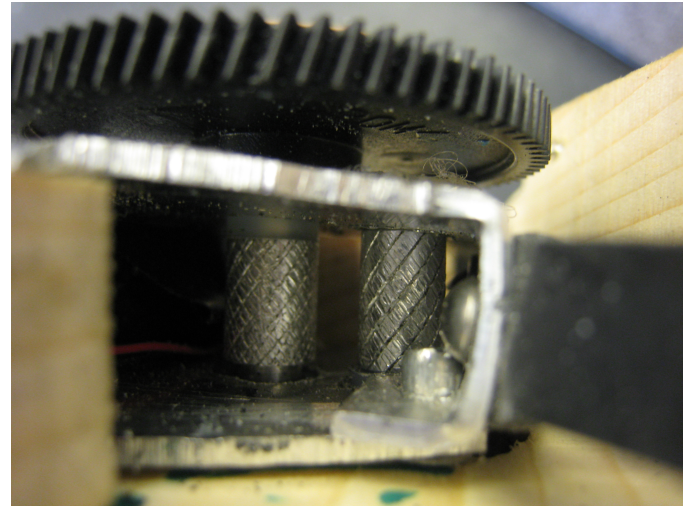


- User Interface
  - Ergonomic
  - Easy to handle buttons
  - Design Selection:  
Momentary switches
- Weight
  - Minimal

# Challenges

## ■ Drivetrain

- ❑ Rollers were unreliable
- ❑ Too far off peak power
- ❑ Too many batteries



## ■ Size

- ❑ Device is “large and bulky looking” according to one customer

## ■ Electronics

- ❑ Can short out battery

# Future Iterations

- Continue to reduce size
  - Fewer batteries
- Improve drivetrain
  - Tooth belt or timing belt
- Safety
  - Torque limiters
  - Clutches
- Reduce weight
  - Injection molded plastic
- Ensure balance

