

Gripper for Individuals with Limited Mobility

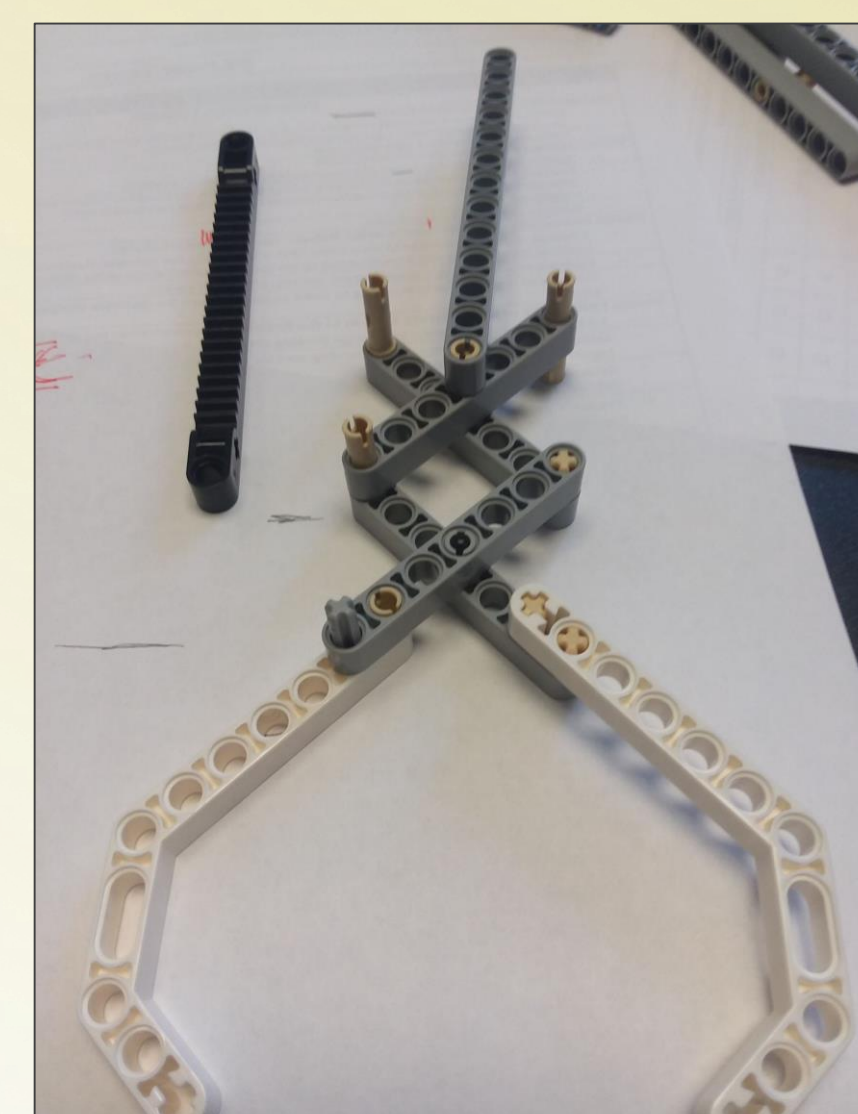
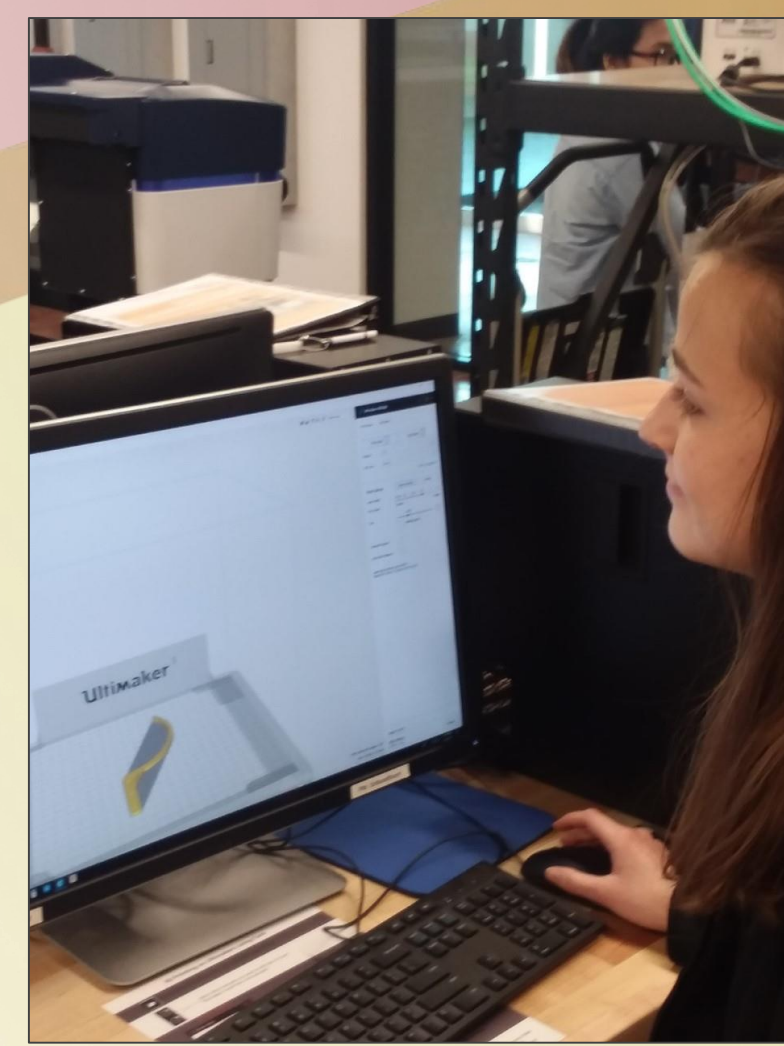
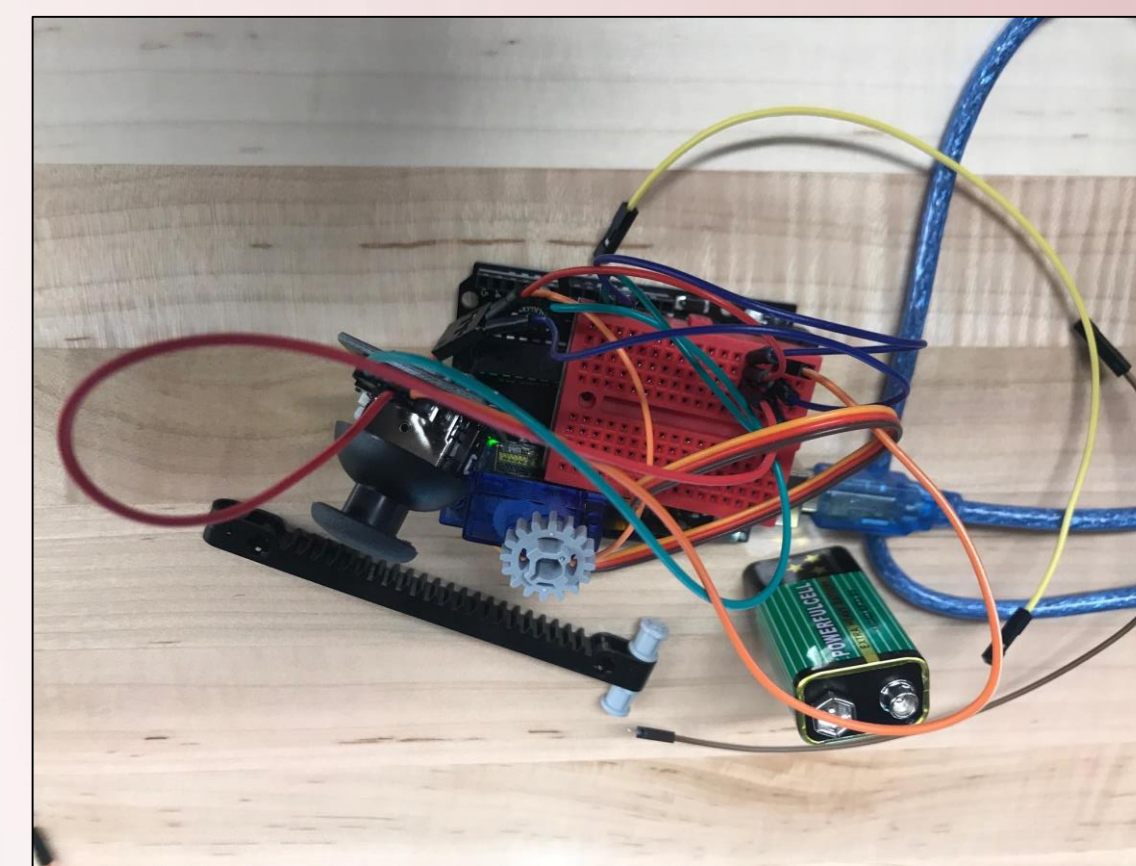
People who have difficulty or pain when moving their hands

- Arthritis



Future Improvements

- Twisting mechanism
- Greater motor strength
- Better materials
- Larger grip size
- Better grip strength



Empathize

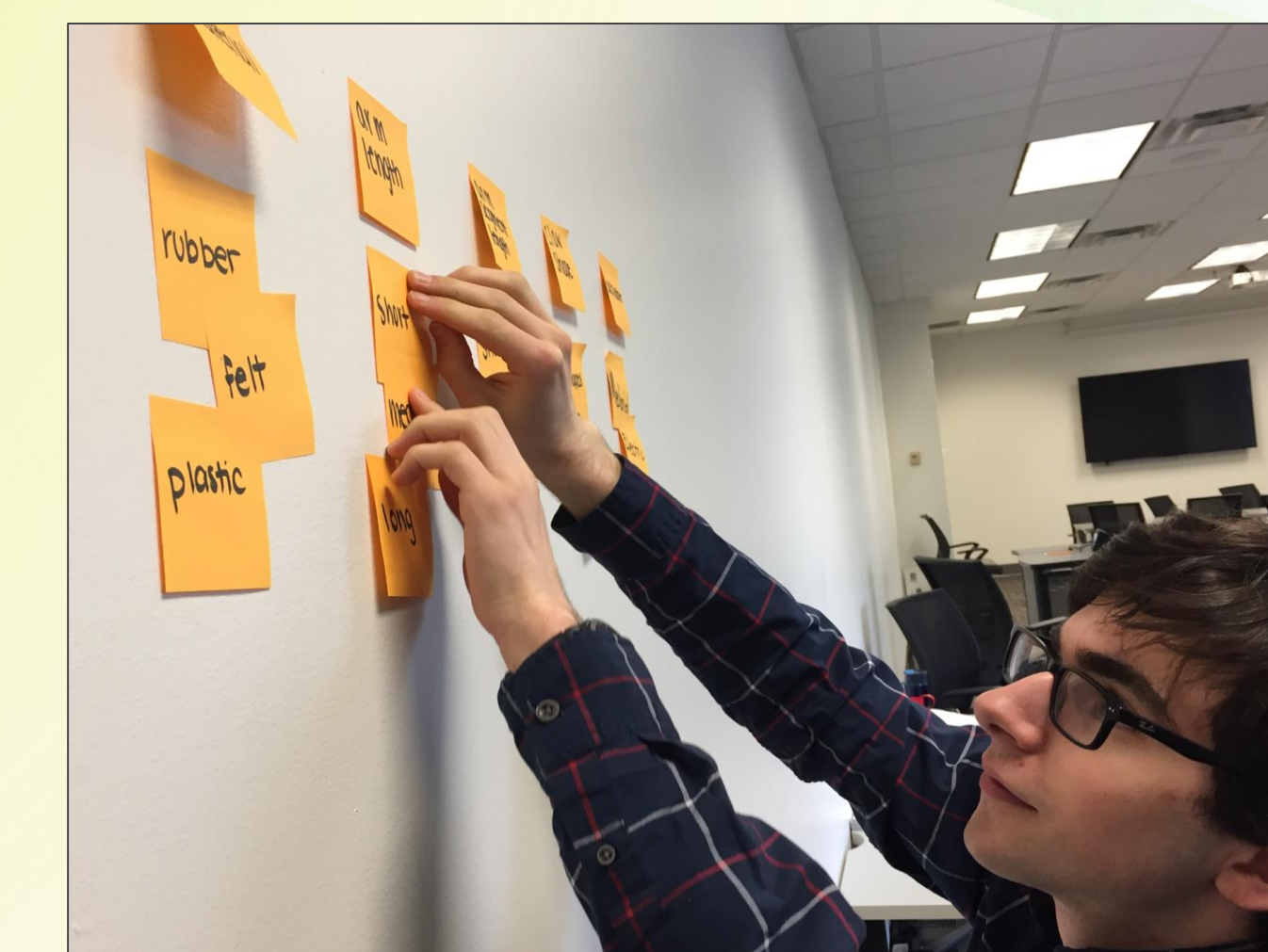
Define

Test

Prototype

Ideate

Row Number	Maximum Relationship	Customer Requirements (Explicit and Implicit)	Weight	Cost	Claw Material Precision Coefficient	Gripping Strength	Claw Closed Width	Claw Open Width	Moment Applied to Hand	No. Use of Motor Skills	Comparative Assessment
1	9	Light-weight	●	○							3
2	9	Affordable	▽	●							2
3	9	Durable	▽		●						4
4	9	Pickup Objects			●	●	○	●			4
5	9	Good Hand/Arm Support	▽						●		5
6	9	Easy To Use Actuator		▽						●	5
7	9	Hold Objects			●	●	○	●			3
		Target	< 1lb	\$100	>0.5	40 kg	0.1 in	5 in	<1 lbf w/ counterweight	4-point	
		Technical Importance Rating	8	1	3	3	6	6	7	4	
		Relative Weight	21%	3%	8%	8%	16%	16%	18%	11%	



Morphological Chart

Claw Material	Rubber	Plastic	Felt
Claw Shape	U-Shaped	2 Points of Contact	4 Points of Contact
Arm Length	Short	Medium	Long
Arm Segment Length	Short	Medium	Long
Actuator	Button	Clamp	Electronic Joystick

References:
 Aging In Place. (2018, November 20). Best Reachers and Grabber Tools.
 Nichols, H. (2017, November 14). Arthritis: Causes, types, and treatments.
 Simplify3D. (n.d.). 3D Printing Material Properties Table - Compare Top Filaments.