



StabiliWare



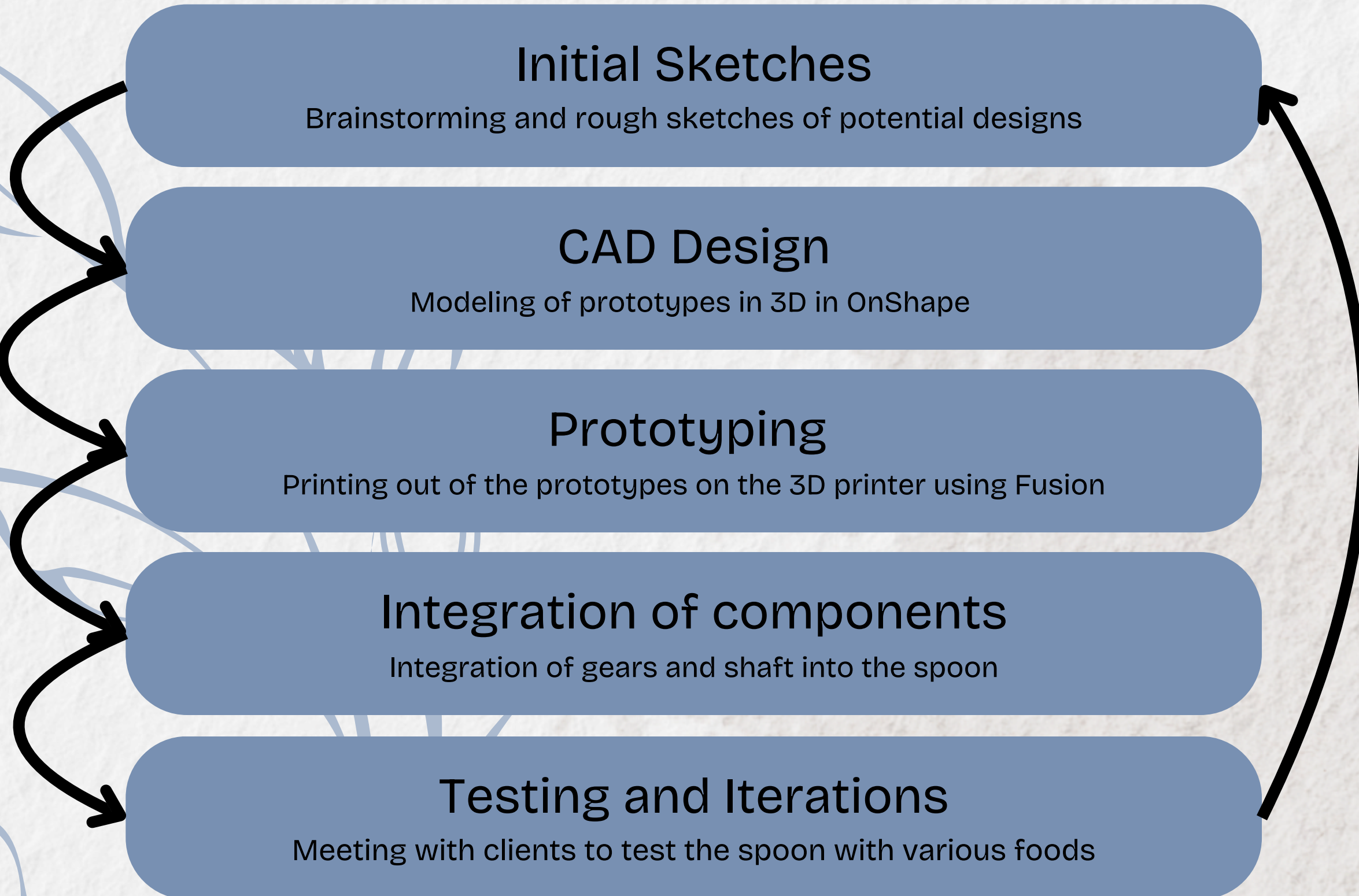
An Assistive Eating Device for Individuals with Parkinson's Disease

Vyshnavi Dontabhaktuni (CEO), Avani Jain (CIO), Sophie He (CTO), Jasmin Bella (CMO)
Advisor: Dr Kevin Crowthers, PhD

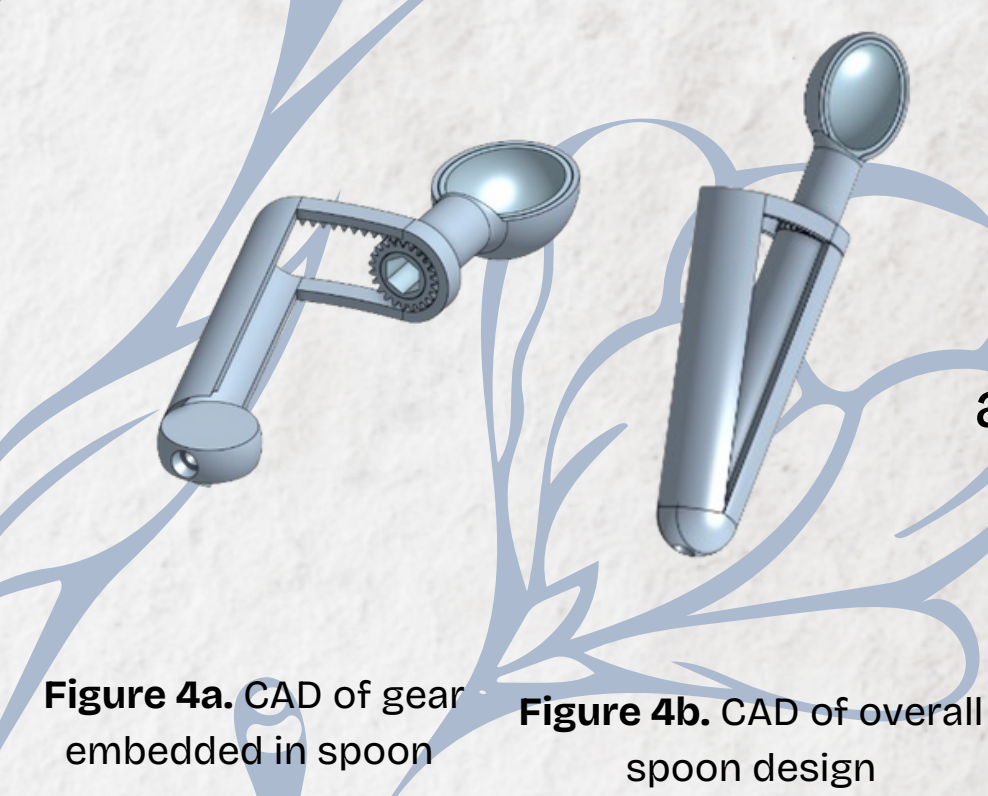
Problem Statement

Individuals with Parkinson's disease struggle with eating because of tremors. Tremors are a common symptom of Parkinson's disease affecting around 80% of those who are diagnosed (American Parkinson's Disease Association, 2017).

Methodology



Current Design



Current Design: Rotational Spoon

Utilizes two bowls where the smaller inner bowl spins when a button is pressed, similar to a trigger ice-cream scooper. It uses a system of gears and shafts to accomplish this.

Design Studies

Study_1	Study_2	Study_3
Determine comfortability to hold and normality	Measure changes in amount of spillage	Differences in time to eat (plate to mouth)

Conclusion

Created a device that successfully enables users to eat with minimal spillage when experience tremors. This allows those with Parkinson's to be independent and have a healthier life.

Engineering Goal

The goal is to develop a device to aid those with Parkinson's in eating without spillage. This proposes a device to mitigate the effects of the tremors by reducing spillage. This will allow those individuals diagnosed with Parkinson's to develop a sense of independence .

Requirements

Table 1. Table of Level 1 and Level 2 Functional and Physical requirements					
Category	Level	Requirement	Swivel Spoon	Motorized Spoon	Rotational Spoon
Functional	1	The device shall allow the user to lift food from their plate to their mouth with minimal spillage.	Yes	Yes	Yes
	2	The device shall allow the user to hold liquid without leaking.	Yes	Yes	Yes
	2	The device shall be dishwasher safe.	Yes	Yes	Yes
	1	The device shall be safe to use.	Yes	Yes	Yes
	2	The device shall be easy for the user to grip.	Yes	Yes	Yes
Physical	1	The device shall be made of a food-safe material.	Yes	Yes	Yes
	2	The spoon shall be less than 8 inches in length.	Yes	Yes	Yes
	2	The device shall be able to hold at least 0.5 tablespoon of material.	Yes	Yes	Yes
	1	The device shall discreet and look like a normal spoon.	Maybe	Yes	Yes

3 Designs

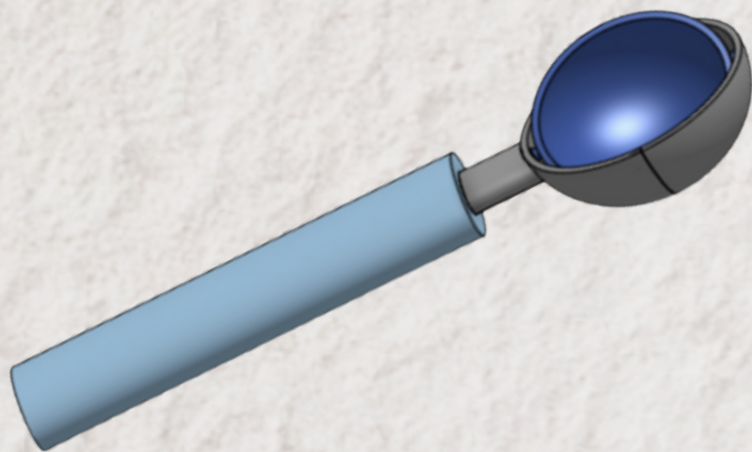


Figure 1. CAD of swivel spoon

Design #1: Swivel Spoon
Utilizes a small bowl inside the larger bowl where the smaller bowl rotates to counteract the shaking of the tremors

Design #2: Spinning spoon
Three main components: an inner, middle, and outer bowl. The middle bowl rotates to cover the smaller bowl using a motor and button.

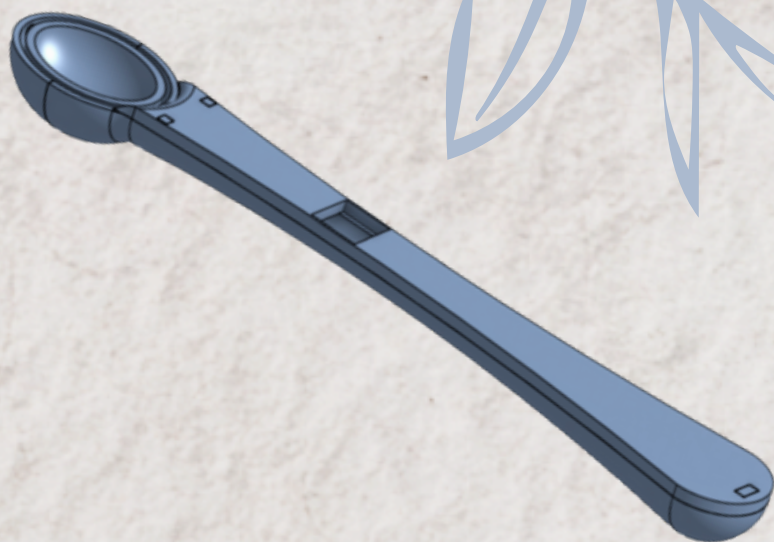


Figure 2. CAD of spinning spoon

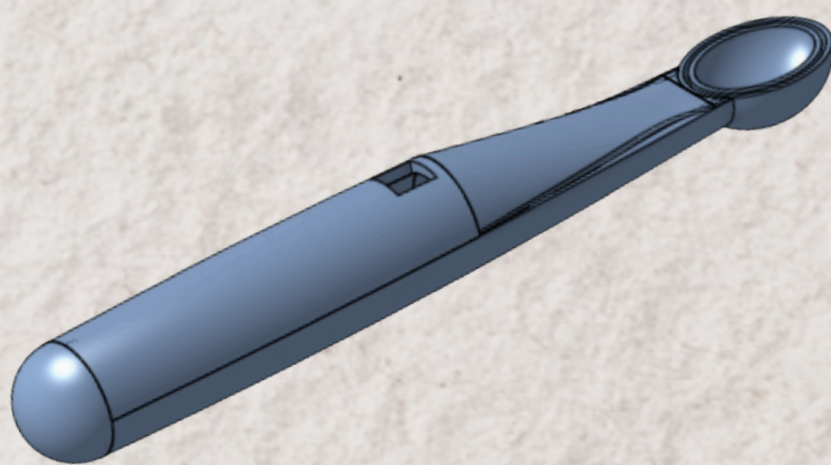


Figure 3. CAD of motorized spoon with button space

Design #3: Motorized Spoon
Two components: outer and inner bowl. The outer bowl spins to cover the inner bowl using a motor and button.

Future Work

- Comprehensive further testing
- Reduce weight
- Reduce size of the handle to ensure spoon looks more 'normal'