

# StabiliTeeth: A Tremor-Reducing Toothbrush

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## Introduction

**Millions of patients** suffer from diseases such as Parkinson's, ALS, stroke, and PTSD.

Our goal was to create an **inexpensive and efficient toothbrush designed to reduce tremors** and restore the ability and confidence for these populations to become **more self-caring and independent.**

Currently available solutions

- Rudimentary solutions that remain ineffective, i.e. larger grip, adding weights, and switching to an electric toothbrush



Proposed solution

- Gimbal mechanism
- Stabilization via 2 servo motors to correct for pitch and roll rotations



## Design

Our design has two core components:

- **Tremor stabilization** mechanism: an **accelerometer** to detect position changes paired with a **microprocessor** that adjusts the **2 servo motors** to compensate for tremor motion
- **Electric toothbrush** mechanism: a commercially available **toothbrush head** and a **DC motor**

Our primary objectives emphasized **user friendliness, weight, size, and price.**

## Material Cost

- MPU6050 accelerometer: \$3
- Teensy LC microcontroller: \$11
- Printed circuit board (PCB): \$2
- 2 x JX CLS6310HV servo motors: \$70 (\$35 each)
- Rechargeable battery: \$8
- Toothbrush head: \$2
- 3D-printed casing: \$10
- Circuit components: \$5
- DC motor: \$5
- **Total: \$120**

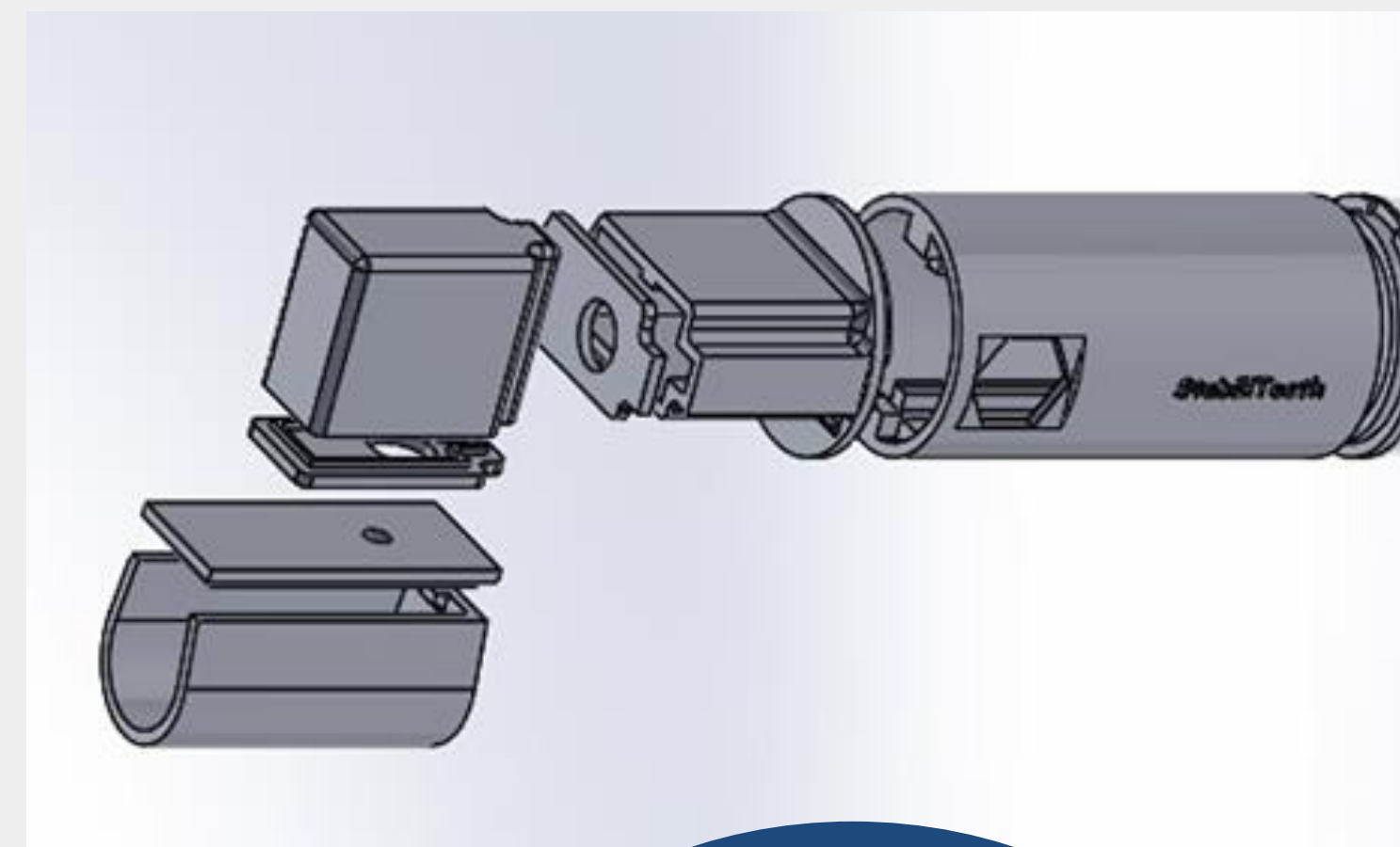
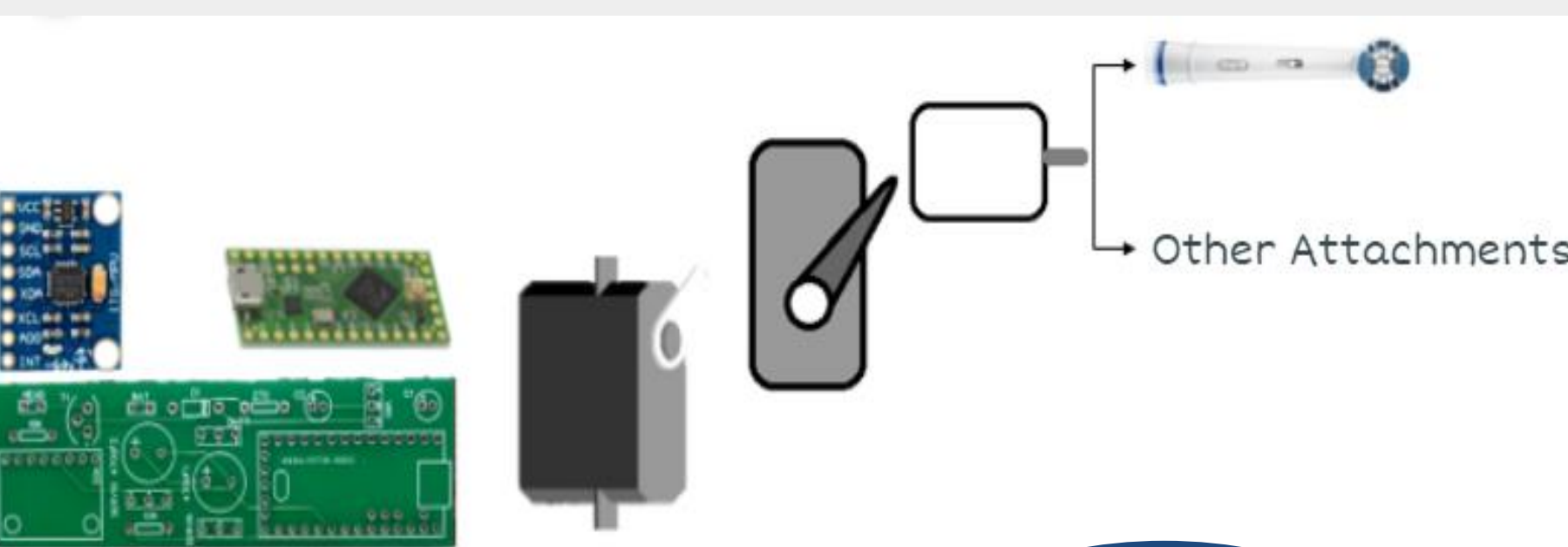
## Future Work

- Further patient testing
- Cost reduction
- Improving ergonomics
- Waterproofing
- Marketing
- Open sourcing design

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- Brainstorming components
- Usability and ergonomics
- Cost analysis

- Programming
- CAD and rapid prototyping
- Circuit design

- Optimizing performance
- User reviews
- Patient testing