



NORTHERN  
ARIZONA  
UNIVERSITY



# Final Presentation Hozhoni Assistive Device

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# Overview

- **Project Description**
- **Introduction**
- **Customer Requirements**
- **Engineering Requirements**
- **Design Solution**
- **Design Comparison**
- **Manufacturing**
- **Testing**

# Project Description

## ► Main idea:

- Design a device helps people with disabilities to pick up and hold objects.
- Design a device has multiple ways to use.
- People with disabilities could help themselves.

## ► Client:

- Terri Engel
- Hozhoni Art

## ► Sponsor:

- WL Gore





# Introduction

## ► Project Problem:

- some People with disabilities can just use one hand.
- People with back problems cannot pick up small object from ground.
- Hard movement.
- Muscles problem

# Customer Requirements

- Lightweight
- Length change
- Easy to set up
- Easy to use
- Easy to store
- Safety



Figure 1: Hozhoni Studio



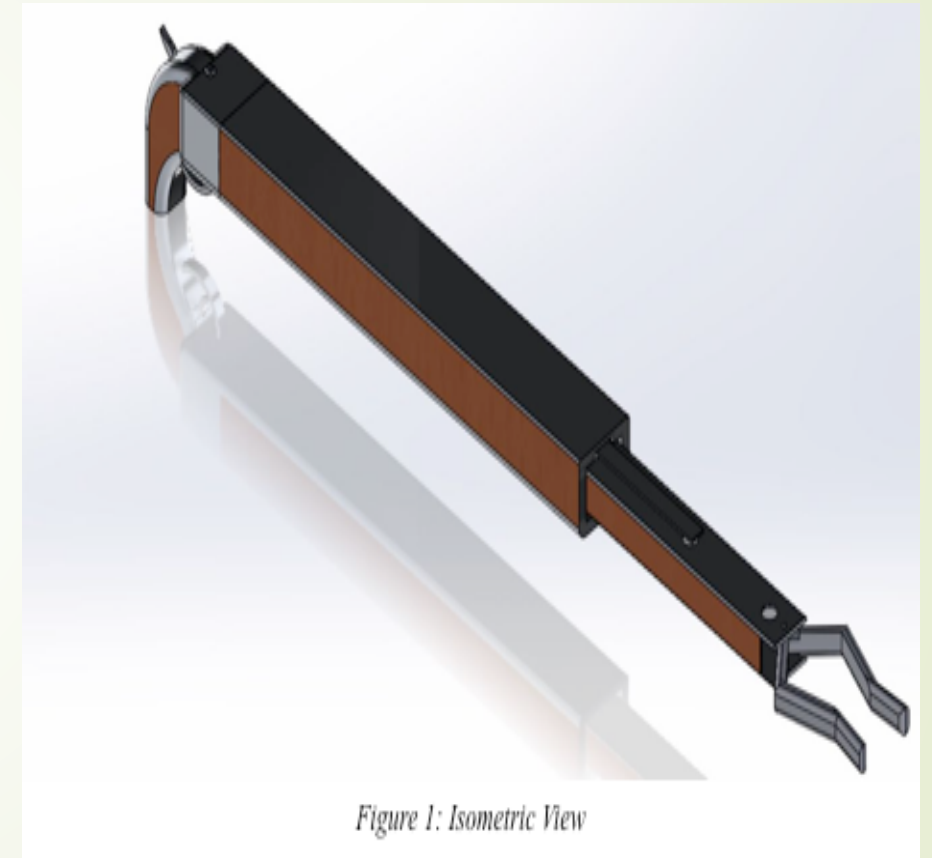
# Engineering Requirements

- Weight less than 1.5kg
- Inner shaft change from 0cm up to 30cm
- Outer shaft 70cm
- Square base (5cm\*5cm)
- No sharp edge (around 5mm)

# Design Solution

## ► FALL 2017 design:

- Safety lock
- 3 different length
- Extender button
- Materials : Aluminum and wood



*Figure 1: Isometric View*

Figure 2: Fall 17 design

# Design Solution

## ► Spring 2018 design:

- Safety grabber teeth
- Advance grabber teeth
- Extend from 0cm to 30cm
- Materials : Aluminum and Plastic

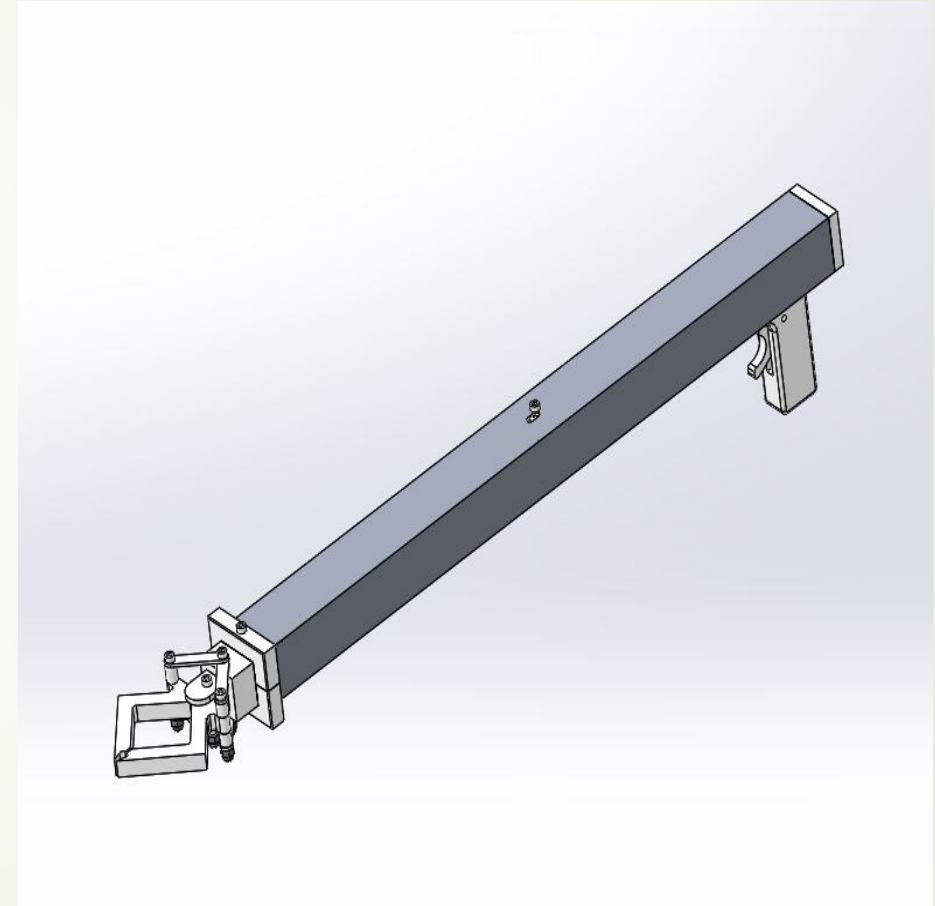


Figure 3: Spring 18 Design



# Design Comparison

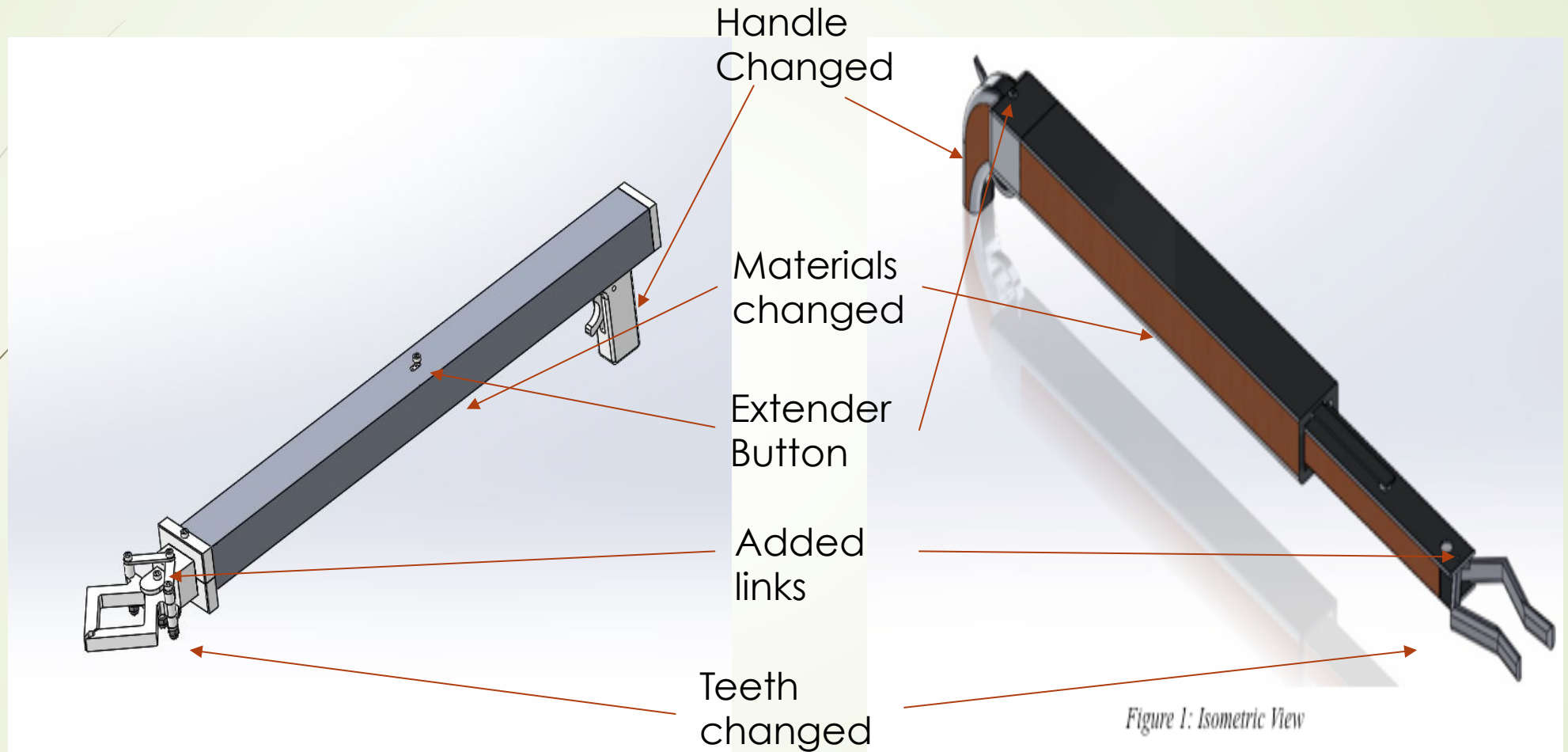


Figure 4: Spring18 design

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Figure 5: Fall17 design

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# Manufacturing

Manufacturing parts process:



Figure 6: Grabber teeth  
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Figure 7: The front material of device  
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Figure 8: Teeth's holder  
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# Manufacturing

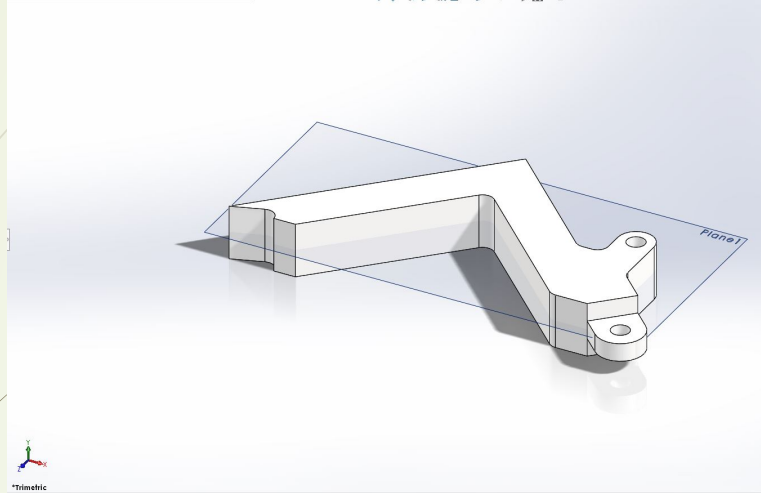


Figure 9: CAD of tooth

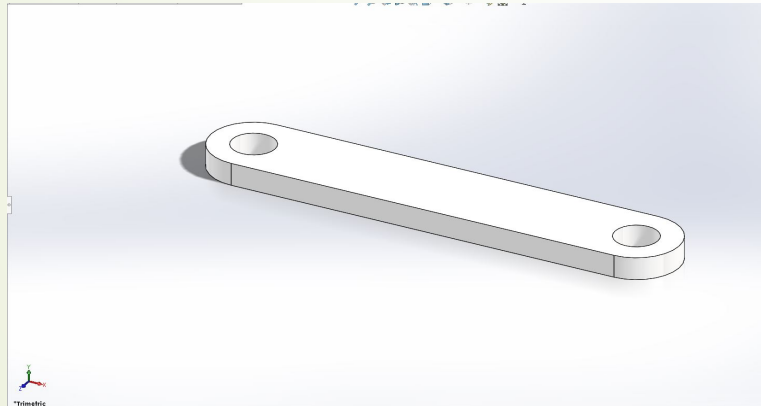


Figure 10: CAD of link



Figure 11: Manufactured tooth

# Testing

- ▶ Holding different diameters object



Figure 12: Hold Pencil

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Figure 13: Color brush1

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Figure 14: Color brush2

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# Testing

- Safety: all objects not damaged
- Test: client used the device



Figure 15: Visiting client  
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Figure 16: Holding bottle of water  
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# Testing

- ▶ Testing weight
- ▶ Testing length



Figure 17: Changing Length

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Figure 18: Weighting device

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**THANK YOU**

**ANY  
QUESTIONS**

