

# Project Presentation Day

Photos by Chris Koyama (WHILL)





























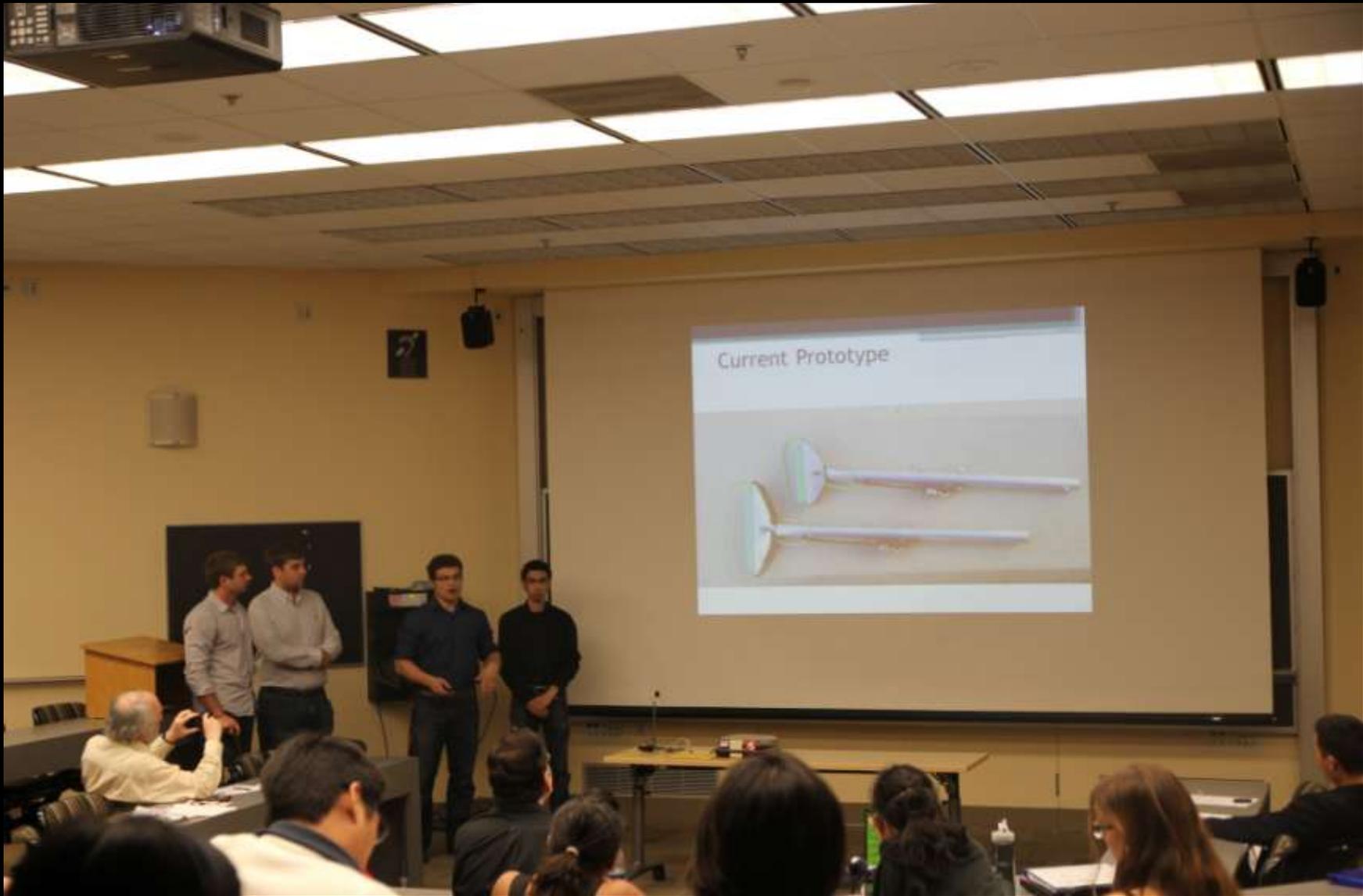


## Improved Vehicle Hand Controls

### The Improved Hand

- Road Defenses
- The Control
- The Brakes
- The Pedals

Current Prototype



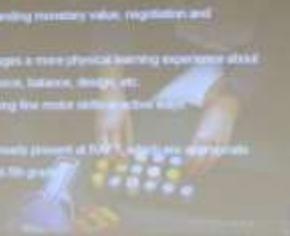






## FINAL DESIGN

- Game emphasizes understanding monetary value, regulation and interest
- Engineering pattern encourages a more physical learning experience about different concepts such as force, balance, design, etc.
- Unlike game emphasizes using the most reconstructive materials
- Estimated cost \$1
- Design project supplies already present at IUPUI, many are available for our target age range (1st-5th grade)













# Educational Design Kit for Children with Disabilities

Disability Heroes

Cassi Janakos

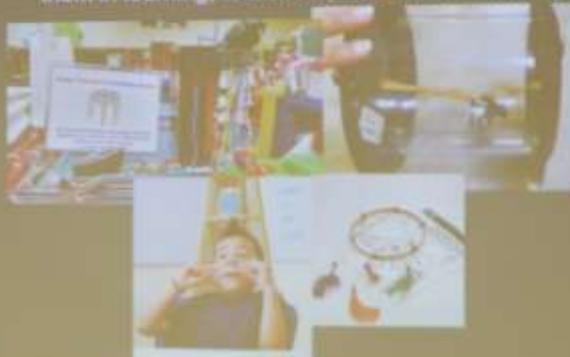
Janhavi Vartak

Alessia von Erb



## Problem Statement

These Educational Design Kits need to be accessible to all children, both with and without disabilities, to engage them in learning, teamwork, and creative thinking.



## Top Ideas in Terms of Orthopedic Impairments/Disability



Top Ideas	Impaired Motor Function	Muscle Weakness	Missing Upper Extremity	Total Score
Square Block Rolling	3	4	5	12
Light and CD Interacting	3	3	3	9
Sundial	5	5	5	15

## Sundial Design

### Materials

- Low cost "bulk bin"
- CD holder, chalk, 12 plastic lids

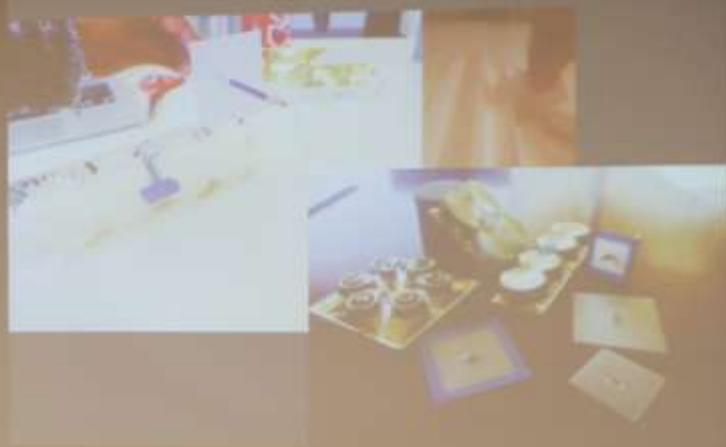


### Curriculum Topics (Grades 3-8)

- Seasons and earth systems
- Earth's place in the solar system
- History of timekeeping
- How to read a clock
- Empirical data and prediction / estimation



## Kit 2: Make Square Wheels Roll



A woman with long dark hair and glasses, wearing a black top, stands on the left side of the stage. She is holding a white piece of paper and looking towards the audience.

A woman with dark hair tied back, wearing a patterned grey and black top, stands in the center of the stage. She is gesturing with her right hand towards the projection screen while speaking.

A wooden podium is positioned on the stage, with a microphone and a water bottle on top.

A large blackboard is mounted on the wall to the left of the stage.



The foreground shows the backs of several audience members' heads, indicating they are seated in a lecture hall or classroom.

## WHILL: Enhanced Visibility

Sarah Cabrero  
ENGI

ID Zeppelin  
Lin Corcacho, Justin Diep  
Final Presentation



# WHILL: Enhanced Visibility

Team LED Zeppelin  
Sarah Cabrerros, Joaquin Carcache, Justin Diep  
ENGR 110 Final Presentation



# WHILL: Enhanced Visibility

Team LED Zeppelin  
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ENGR 110 Final Presentation



## The WHILL



## The Problem





## Needs:

Ensure wheelchair users can travel safely at night

Ensure drivers are able to see wheelchair users





Bike Lights



Head Lamps

## Inspiration





## Design Goals

### 1. Illumination

- Forward Illumination
  - Immediate foreground
  - Objects need to be visible in path (table or otherwise, etc.)



## Design Goals

### 3. 'Cool' Factor

- Automatic light sensor as well as a manual override switch
- Integrated with WHILL's unique design
- Light show!

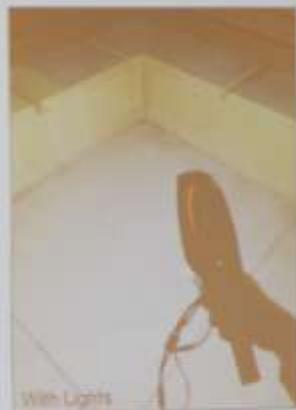


## Prototyping





## Testing at Night



## Manufacturing

Heat bending: white matte acrylic



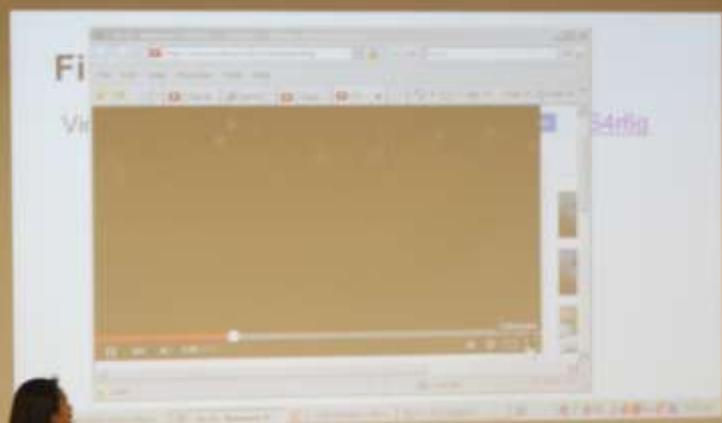


# Hardware



Three people are standing in front of the projection screen. A woman in a black blazer and white shirt is in the center, looking towards the camera. Two men in light-colored shirts are to her left, one of whom is gesturing with his hands. In the foreground, the back of a man's head and shoulders is visible as he sits at a table, looking towards the presentation.

A wooden podium stands on a table to the right of the presenters. On the table, there is a water bottle, a small black device, and a green bag. The room has a white wall with a projector screen and a black speaker mounted on the wall to the left.



E10: Enhanced Visibility





## Final Product



## Future work

- Explore different manufacturing methods (ex. vacuum forming)
- Fully integrate our hardware into the WHILL
- Bluetooth control with smartphone app

## Special thanks to:

- Dave Jaffe
- Fernanda Castelo
- WHILL team:
  - Neeto Sakakibag
  - Tri-Tien Che
  - Chris Koyama



# Knee Extension Assistance

The Caffeinators  
Marshall Haltom & Susan Nitta







## Research

- Current products
  - Knee extension devices
  - Materials
  - Attachment methods
- Orthotist perspectives
  - Gary Berke
  - UC5F
- Feedback from Max





## Current Prototype

- Functionality
  - Assist knee extension
  - On/off modes
- Features
  - Adjustability
  - Simplicity

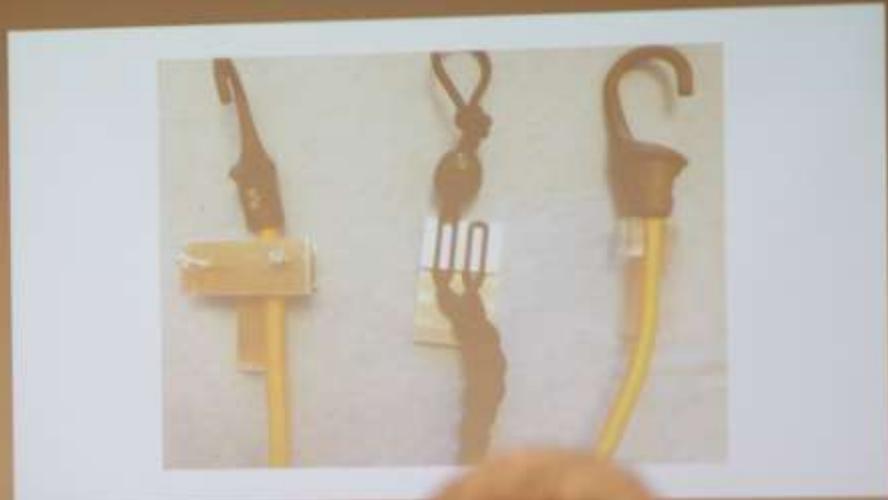


[http://youtu.be/sD80ZD\\_Q30](http://youtu.be/sD80ZD_Q30)

## Moving Forward



- Bungee tests
- Pulley adjustment
  - Fasteners
  - Sizing
- Collar development
  - Mounting
  - Polycarb
- Cosmesis



A male presenter in a checkered shirt and khaki pants stands in the center of the stage, gesturing with his hands as he speaks to the audience.

A female audience member in a blue and black striped sweater stands to the left of the presenter, looking towards the screen.

A blackboard is visible on the left wall, and a desk with a laptop and other equipment is positioned near the stage.

A wooden podium sits on a table in front of the stage, and the back of an audience member's head is visible in the foreground on the right.























