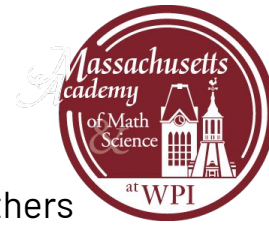




# StrikeThrough: Creating a Switch-Based Assistive Bowling Ramp for Students with Cerebral Palsy



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## Problem Statement:

People in a wheelchair who lack the needed arm strength are unable to bowl independently in a way that allows for proper speed, accuracy, and control.

## Objective:

The objective of this project is to create a bowling launcher that allows someone in a wheelchair or with a lack of arm control to bowl independently with some degree of control over the ball in an indoor setting.

## Level 1 Requirements

- Latex free design
- Mobile - Can be carried by two people
- Dimensions: < 2 x 5 x 4 ft
- Weight: < 20 lbs
- Safe for both helpers and users

## Construction Methods

- PVC chassis/skeleton for ramp
- Linear Actuator-based ball launching system
- Arduino-controlled electrical system
  - User-controllable
  - Buttons

## Designs

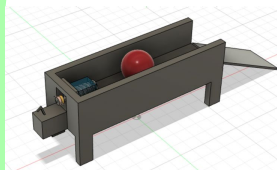


Figure 1.  
Initial CAD  
Model



Figure 2.  
PVC Ramp  
Chassis

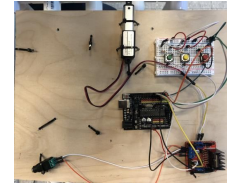


Figure 3.  
Electrical  
System

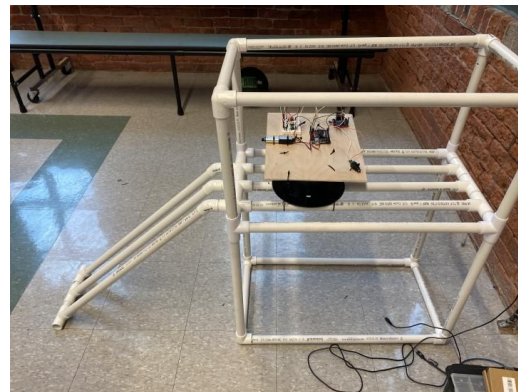


Figure 4. Final Prototype

## Design Studies

- 1) Ramp (no electronics)
- 2) Spring-based system with a piston retracted by a motor
- 3) Average velocity of the ball after being pushed by the linear actuator

## Conclusion

- Allows users to push a button to launch a bowling ball
- Fulfills all Level 1 requirements
- Future Steps
  - Prepare prototype for client
  - 3-button system
  - Audio and Visual Stimuli