

Document Handout

Problem

People with physical disabilities, such as cerebral palsy, struggle to complete the full range of motion required to bowl.

Machine-based bowling systems have not been widely implemented to make bowling accessible to individuals with physical disabilities.

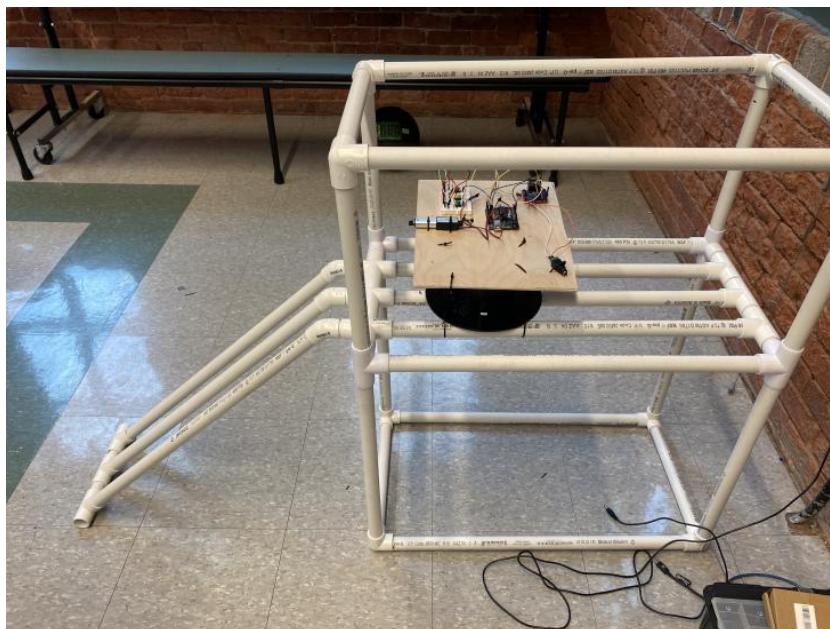
Goal

The objective of this project is to implement an adaptive bowling device to make bowling accessible to people with physical disabilities.

This was done through a linear actuator with a switch based mechanism to push the ball down without requiring any physical exertion.

Build Process

This prototype was built with a PVC chassis exterior using 45 degree elbow connectors, 3 piece corner connectors, 3 piece tees, 4 way tees, 4 way tees, 4 way cross pieces, and 5 way cross pieces. The PVC has a diameter of 0.75 inches and was cut with a PVC Pipe Cutter. The electronics were added to a cut piece of plywood which was put on top of a stand to increase the height of the actuator to be at the center of the basketball. The electronics were zip tied to the plywood and the actuator was secured via zip ties as well.



To Use Device

1. Place basketball in the second groove of the ramp as shown in Figure 1, in front of the tip of the actuator.
2. Align the bowling ramp with your pins using the ramp as a guideline.
3. Press the red button to push the ball.

Care and Maintenance

There is minimal care to our product, however there are some things to keep in mind. Avoid pressing the button to release numerous times in a small time to avoid any rapid, sudden movement of the actuator. Additionally, avoid turning the ramp on its side to keep the electronics in a stable position.