To Product → To Design → To Perform

College of

Department of Mechanical & Industrial Engineering

ME, ECE, BE Capstone Design Programs

Team 7: Julian Wants to Play Basketball

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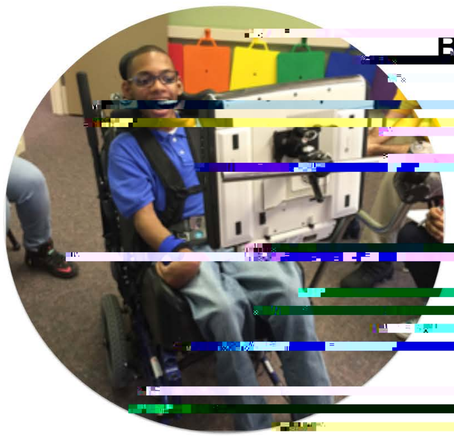
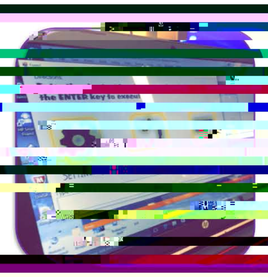
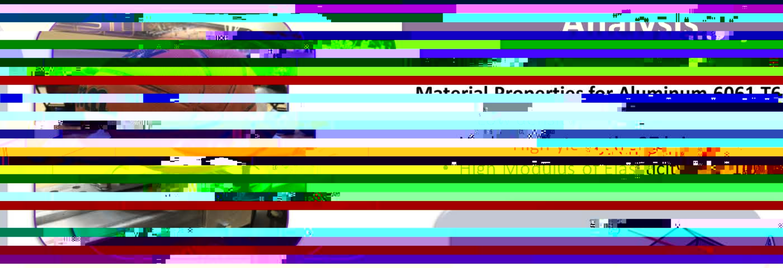
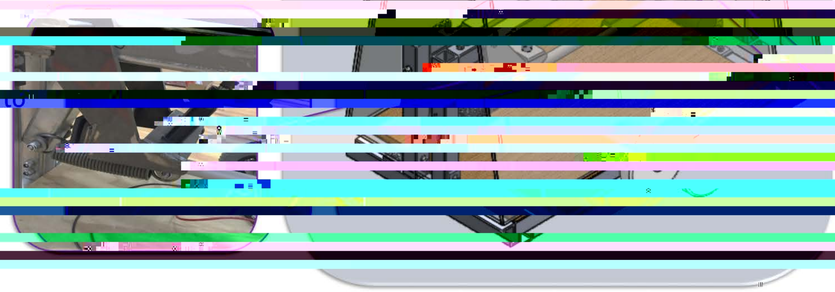


Product Overview







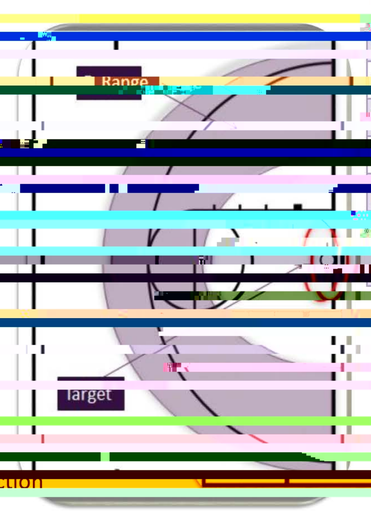
Objective Statement

The purpose of this design is to give Julian, an individual with CP, the opportunity to play basketball through an electro-mechanical device designed with the intent of allowing him to shoot a basketball.

Functional Requirements & Engineering Specifications

- Safe
- Manually Mobile
- Shoot ball
- Interface with Julian

Specification	Correlating Value
Power Supply	840Wh
Range of Operation: Kill Switch	12ft-22ft from goal
Feature	
Budget/Cost Effe	
Structural Integrity of Wall	
Shoo	
Weight	200lbs or less
Dimensions	4ft L x 4ft W x 5ft H
Actuator Displacement	0.98"/s
Relay Circuit Consistency & Programmatic Prevention	100% success rate
Drive Shaft Yield Stress	45 KSI
Catapult Beam Bending S	
Graphi	



Study & Results

Variables	Trial 1	Trial 2	Trial 3	Trial 4
Shock Absorb				
Distance fro				
			0.5125	0.5125
Number of shots made	7 out of 11	11 out of 45	5 out of	
Shooting Percentage	18%	24%	29%	10%

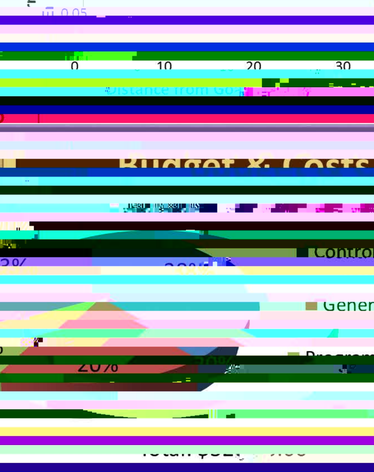
- The distance from the free-throw line is measured from the back of the free-throw line to the front of the device. It is essentially shooting a high school 3-point shot.
- The shock absorber pads are 2" pieces of rubber that are
- Interfacing capabilities were determined to be a success
- The maximum shock absorber setting on each is 8

$$\sigma_{max} = \frac{F_{max}}{AE} = F_{req} = \frac{I\omega}{r\Delta t}$$

$$E = -I\omega^2 \approx 1200\ in \cdot lb$$

Allowable Error as a Function of Distance

Budget & Costs



Sponsors: St. Julian's Academy, Bayou Thorpe PME, David Fleshman, RPKBBM, Advisor: CAPT David S.