To Predict ▶ To Design ▶ To Perform

College of Engineering
Department of Mechanical & Industrial Engineering

ME, ECE, IE Capstone Design Programs

Team 8: Power Wheel Chair Trainer

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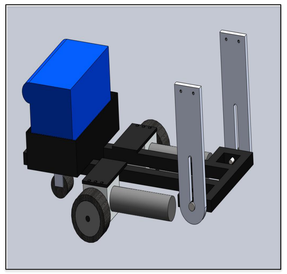
Background

This prototype will be used as an indoor electric wheelchair training device for an individual with Cerebral Palsy. This device will allow the user to practice indoor powered movement before purchasing a more expensive electric wheelchair.

Engineering Specifications

Specification	Value	Tested Value
Max Weight of User	90lbs	100lbs
Weight of attachment	<90lbs	75lbs
Stopping Distance	<3ft	4.8 in
Clearance Height	7"	7"
Attachment time	3 min.	3 min.
Radius of curvature	<32 inch	25 inch
Power Supply	480Wh	480Wh
Battery Weight	30lbs	25lbs
Speed	<2 mph	1 mph
Safety	>7	>7
Battery Life	1 hr	4 hr

Design Overview

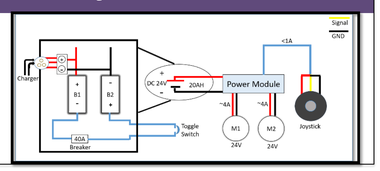


Objective

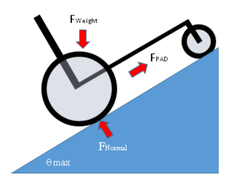
Design a powered attachment device for a manual wheelchair, controlled by a joystick on an adjustable arm to cater to the user.

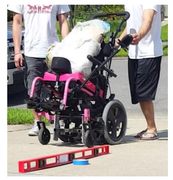
Electrical Safety

-Power module protection
-Sealed lead acid battery case
-Electrical Breaker and E-Stop



Tipping





Max Angle	12 degrees
Static Tip	25 degrees

Codes and Standards

RESNA WC-1 and WC-2
FDA Title 21 Section 890.3800-3940

Safety

-Tipping tests
-Material studies
-Speed limitation
-Impact Bumper

Budget

Total Budget = $4,500 Actual Cost = $1,600

Controls	Power Comps	Framing	Attaching Arms	Other
$700	$265	$320	$300	$108

Concept Generation — August
Re-concept Generation and Selection — September
3D Model & Analysis — October
Design Completion — November
Order Parts & Materials — December
Manufacturing — January
Testing — February
Final Prototype Completion — March
April
May

Sponsors: Elissa McKenzie, St. Lillian Academy

Adviser: Gabriel De Souza