



Steering Wheel Not Included

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Abstract

Children with limited mobility often do not receive much exposure to socialization that is necessary for cognitive development, so Go Baby Go foundation was created in 2012 at the University of Delaware in order to help those children. It started with developing a set of Do-It-Yourself (DIY) cars for families with children with mobility restrictions. These cars have shown to be a cost-effective means of enabling young children to move and interact with their peers. The goal of this project will be to design and build a new version of the GBG retrofits – specifically to design a universal control for children that extremely limited mobility of their arms and/or legs. The team sought to come up with a product that: is not restrictive, that provides sufficient securement and support options, and that puts safety first above everything else.

Engineering Requirements

Engineering requirements for this project were constructed based on the customer requirements. The following engineering requirements were approved by the project's client.

Engineering Requirements	Target	Tolerance
Material Cost	\$350	< \$400
# of Securements	2	≥ 1
# of Supports	2	≥ 1
Weight of Car	60 lbs.	< 100 lbs.
Material Access	Local Stores	Shipping < 3 weeks
Assembly Time	2.5 hrs.	< 4 hrs.
Significant Material Lifetime	3 years	≥ 2 years
Adaptability	4 adaptable features	≥ 3 adaptable features
Adjustable Speed	Starting speed of 1 mph	< 2 mph
Unique Solution	Unique from past GBG solutions	Unique

Table 2: Engineering Requirement

Cost Analysis

The cost for the car is shown in the table below.

Part Name	Cost [USD]
Power Wheels Car	159.99
Push Button x 3	50.85
Ultimate Starter Kit	48.99
Primary Wire x 3	15.57
Arduino Motor Shield	24.97
Kickboard	5
Male and Female Disconn	5.98
Development Board	7.86
PVC Pipes x 2	3.28
PVC Elbow x 2	1.96
Total	\$324.45

Table 3: Bill of Materials

Customer Requirements

The following customer requirements are generated based on the client's request. They are rated 0-5; 5 having the most importance and 0 having the least importance.

Customer Requirements	Weightings	Percentage
Cost	4	11.59%
Safety	5	14.49%
Quality	4.5	13.04%
Transportable	3.5	10.14%
Unique Solution	4	11.59%
Longlife Time	3	8.70%
Material accessibility	4	11.59%
Easy to assemble	3.5	10.14%
Control System	3	8.70%
Total:	34.5	100.00%

Table 1: Customer Requirement

Project Goal

The goal of this project was to create a unique GoBabyGo car that is adaptable to various children regardless of their circumstance, achieved with the following components, and that is replicable, allowing any parent to follow this process to make their own kid's personal car.

1. Steering Buttons
2. Armrests
3. Headboard
4. 5-point Harness
5. Go Button

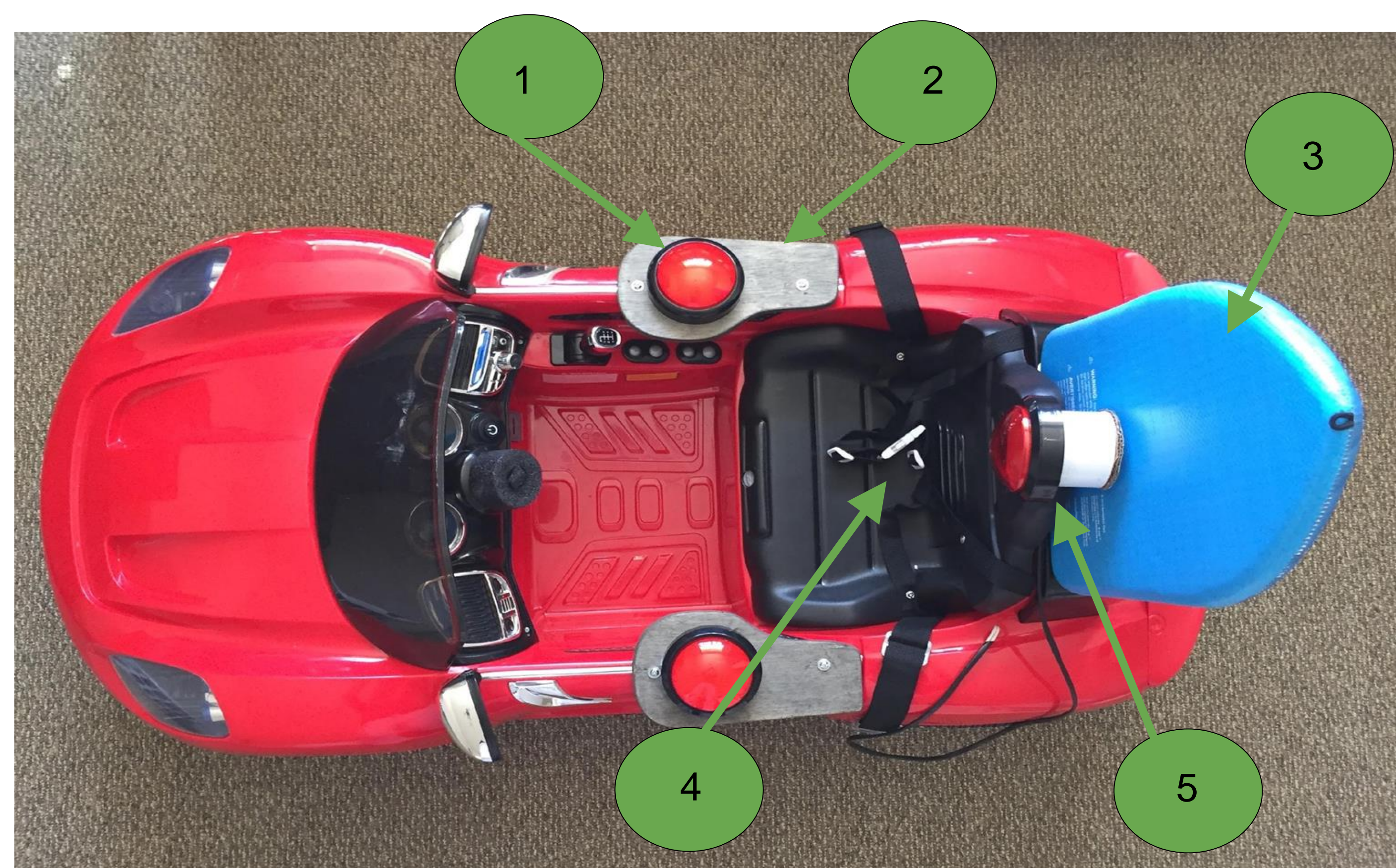


Figure 1: Final Design

Proposed Design

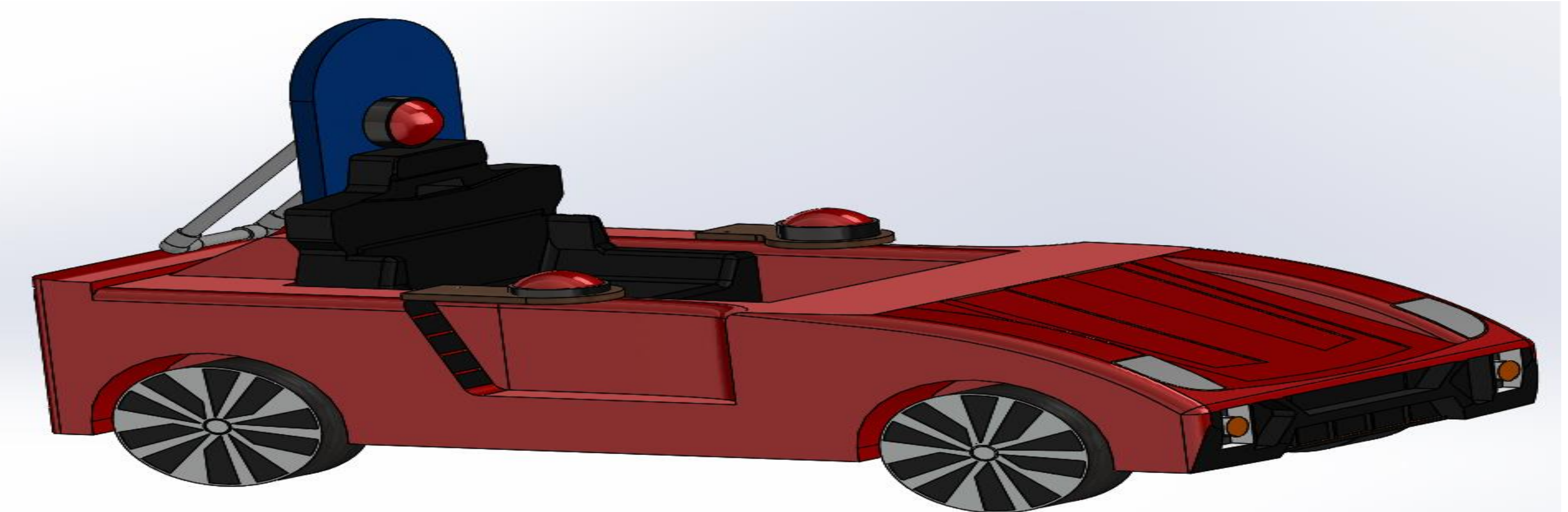


Figure 2: Final Design CAD Assembly View

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