StarRider

Developing Young Minds, One Ride at a Time

CCS: StarRider

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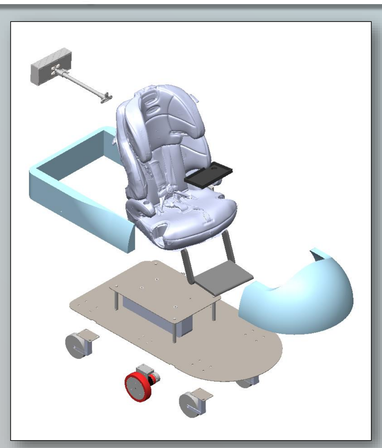
Background

The goal of StarRider is to provide children with mobility impairments an alternative way to practice cause-and-effect play, which is essential for developing young minds. The device is a motorized cart that can be actuated by the user using a panel of buttons. It is intended to be used in supervised therapy sessions, and includes a separate controller for the physical therapist to operate the vehicle. In order to accommodate a wide range of users with differing motor abilities. StarRider allows the user to prompt movement using controls located by the hands, feet, or head, and can also be operated using a child joystick.

Overview

The most critical sponsor specifications influencing the design of StarRider were its ability to support a load of 200 lbs, move less than 3.5 mph, and to have controls at 5 different locations on the vehicle. The device also needed to easily maneuver in therapy sessions while integrating a tilting seat. The physical therapist overseeing operation of StarRider also needed to have control of the speed and time that the vehicle translates following the press of a button. These specifications allow StarRider to accommodate users with a variety of needs.

Exploded View



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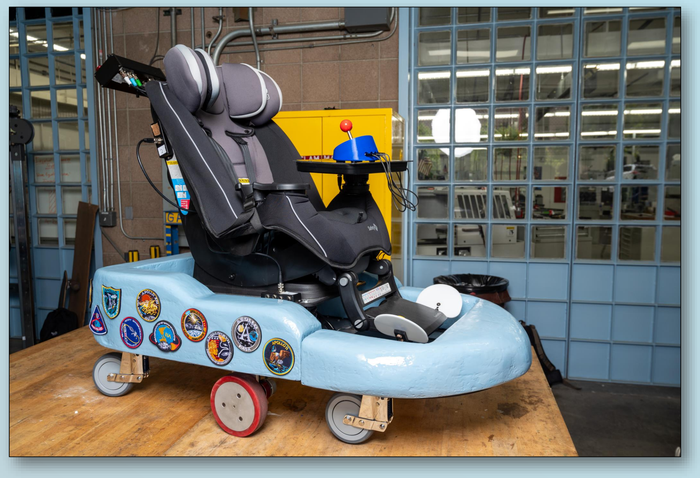


Fully assembled device with decorated shell and joystick attached

Key Components

PT Controller

Center of controls. Allows the physical therapist to drive the device while adjusting speed and button activation to suit a particular child's needs.

Chassis

Main support for the device, waterjet from 1/8" Aluminum to safely support a weight of up to 200 lbs.

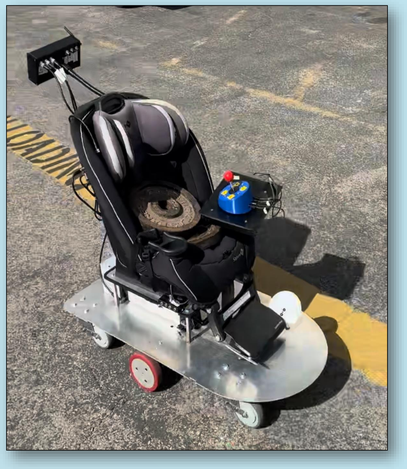
Child Hubs

Hubs located at 4 locations on the vehicle allow the controls to be accessible to any range of mobility impairments.

Motors

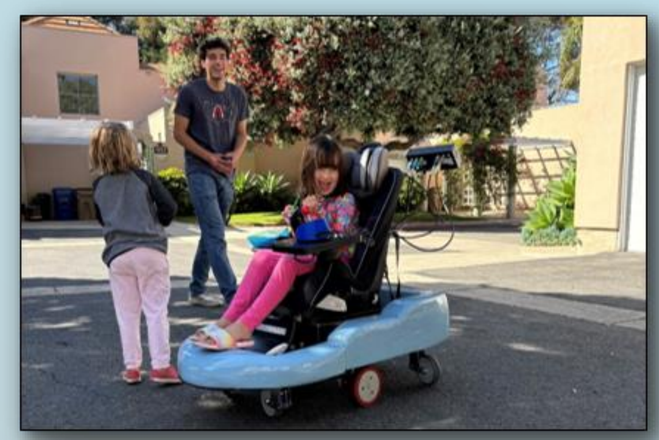
Brushless motors with built-in brakes and optical encoders. Powered using a 24V battery, actuated using PWM signals, and can accurately control speed.

Load Test



- Loaded device with increasing weight in increments of 25 lbs
- Ran device through all key movements at each weight
- Device was still maneuverable and stable while fully loaded

Live Test



- Tested safety and enjoyment of device with a 4 year old, 5 year old, and a 7 year old
- Allowed children to freely operate device in an open area
- Device performed as designed and was overall appealing to each child

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