Motorized Pediatric Stander

Senior Design Project 14045

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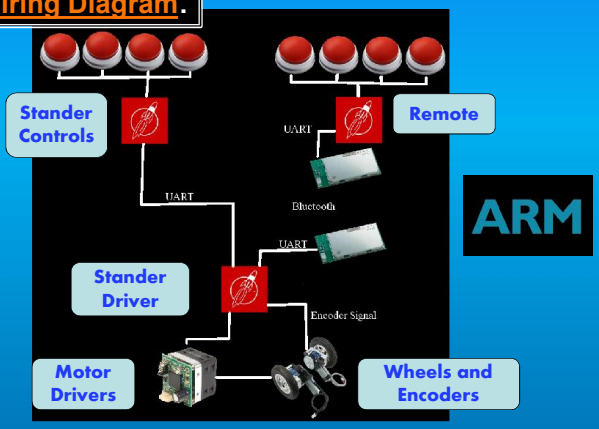
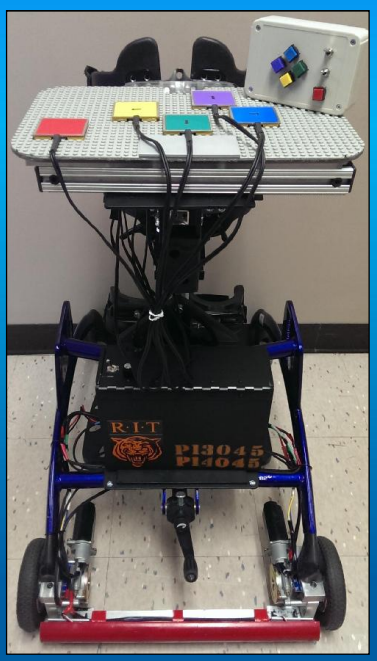
Project Background and motivation:
A motorized pediatric stander is a device similar to a wheelchair, meant to assist a disabled child to move around their environment in an upright position. Motorizing such a device will give a child with cerebral palsy the autonomy to propel themselves that they ordinarily wouldn't have. This project is in collaboration with CP Rochester.

Electronics Overview:
There are 3 main pieces of the electronic system:
1) Stander Driver – controls the motors and central communication
2) Stander Controls – communicates the user input to the Stander Driver
3) Remote Control – uses a Bluetooth connection to transmit controls to the Stander Controls

Customer Requirements:
- Professional appearance
- Drives straight
- Full access to table – flexible tray
- Child/weather proof
- Third party controls via ergonomic remote – Override & Assist modes

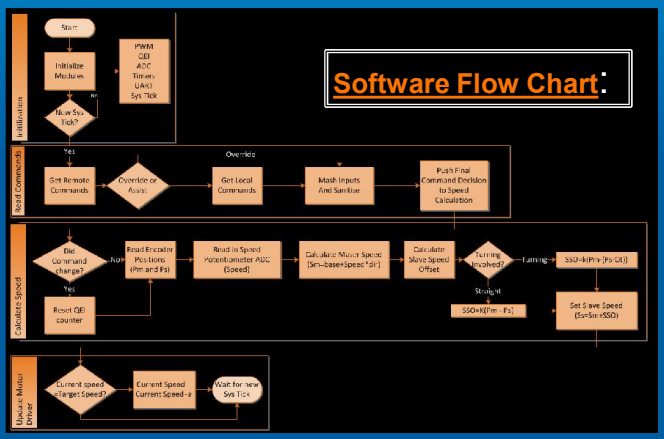
Wiring Diagram:





Remote:
The remote was designed to be smaller and lighter for easier overall use.

Software Flow Chart:



Tray System:
The existing tray was modified to accommodate a wider working range for the user. The modifications include adding a hinge system so that it can fold, as well as tracks for the work surface to slide both laterally and longitudinally.

Electronics Packaging:
A solution to house all of the electrical components including the battery was developed to protect them and the user. A central box houses the battery, motor drivers, and microcontroller. This consolidation allows for more of a "plug and play" capability to easily move the unit to additional standers.
Only one cord runs from this central box to a smaller box housing the microcontroller for the user controls, located under the tray.

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