Switch-Adapted Child’s Toy Race Car

Overview
Physical disabilities make it very difficult for children to walk and play with their peers. This leaves them out of basic social interactions like playing on a playground or learning a new game which is a significant issue regarding their social and cognitive development. The team was tasked with modifying a child’s ride-on toy car to allow a child with cerebral palsy, spina bifida, or a similar disability to better interact with his or her peers in a play setting.

Objectives
The adapted car will allow for a variety of adapted switches and switch locations so a child could drive using either their hand or their head to push the switches and provide postural support that is modular and can be easily moved or removed as needed for an individual child. More advanced features include sensors that prevent the car from running into/over obstacles, a remote “kill switch” so a guardian could stop the car if the child approaches a dangerous situation, and smooth starting and stopping to make for a more comfortable ride.

Approach
- The customer needs were gathered directly from interactions with a children’s physical therapist as well as through first-hand observation of children interacting with an unmodified car.
- The concepts were broken down into subsystems, and each of the concepts were vetted using either a screening or a scoring matrix.
- Electronics for the car were prototyped, tested, and analysed using small scale components before full scale testing and implementation.
- Support structures were designed and critiqued before being added to the car.
- The child’s enjoyment and safety were considered with every addition or change made to the car.

Outcomes
The team solved this unique problem of providing physical and social assistance by focusing on:

- Safety
- Performance
- Child Enjoyment

This project was specifically designed for the children our sponsors interact with daily. All goals were met and we are proud to give our project to RERC on AAC.