Automobile Gearshift Release Mechanism for a Disabled Person

Overview
The primary objective of this project is to develop a gear shift release mechanism for a disabled person who is unable to apply the necessary force to the button to shift the car into the appropriate gear. The current market products require the user to have fine motor skills, which makes it unusable for many people. The primary user of this device, Marty Kester, suffers from Charcot-Marie-Tooth Syndrome, and has little control over his fingers. In addition to fastening to Marty’s vehicle, the device was to be adjustable to be able to fit on various makes and models of vehicles.

Objectives
Create a working prototype that:
- Securely fits to a floor-mounted gear shifter.
- Enables the user to shift gears using one hand and in a consistent manner.
- Is able to fit on primary user’s vehicle and various makes and models of current market vehicles.
- Is both functional and aesthetically pleasing to the user.

Approach
- Customer needs were gathered by speaking with the primary user, Marty Kester.
- A total of 13 concepts were created among teams at PSU, SNU, and CNU.
- To properly test and optimize the customer’s needs, there were three (3) final designs (including solid models and prototypes) were created to address issues associated with current market products.
- PSU created a torsion spring concept that converts downward motion of the hand into lateral force needed to press the button.
- SNU created a lever arm concept that uses a vertical lever arm that is pivoted into the button when the user applies a downward, lateral force.
- CNU created an electric motor concept that utilizes a servo motor electronically actuate a rack and pinion gear to press the button.

Outcomes
- Users with little dexterity can operate device.
- Easy to install.
- Offers a time savings for the user.
- Safe for everyday driving.
- Fits on various vehicle gearshift designs.
- Improves the users’ quality of life.
- Designs are aesthetically pleasing and more ergonomic than existing market products.
- Offers a cost savings from $27 to $63