Nearth Team 2, Mechanical Engineering

Overview
Nearth founder Ross Garside discovered a new technology to climb up and down poles. His technology utilizes rotating bungee cords to create a gripping and climbing motion. His original design needed many improvements before it could be a marketable product.

Objectives
The team set out to complete the project through three steps: redesign the drive system that turns the cords, enclose the system with a shell, and create a payload attachment system. The redesigned prototype will then be used to gain funding for further research and development.

Approach
- The team met with Nearth to discuss their needs and vision for the next Payload Hauler.
- Chain drives, belt drives, gear trains, and planetary gears were examined for drive systems with a chain drive being chosen.
- A fiberglass shell was chosen to enclose the system,
- A four pin system would be used to attach payloads to the Payload Hauler.
- The team looked at several patents provided by the sponsor to view how other climbers work and if any ideas could be applied to the Payload Hauler.
- The team went through several design concepts before deciding upon a rail prototype that the chain drive would rotate between.
- A SolidWorks model was made for the team to visualize the concept and finalize dimensions.
- Alpha and beta prototypes were constructed before the final prototype. Each were refined and optimized and the improvements implemented were carried over to the final prototype.
- Testing was performed by checking the Payload Haulers Capacity. It was able to carry a maximum load of 30 lbs.

Outcomes
- The Payload Hauler was completed with a new drive system, fiberglass shell, and payload attachment system
- The Payload Hauler has the potential to reach over 90 markets once the funds have been raised
- Nearth now has a final product that can be used to raise funds and a test bed for future improvements.