



Jack Rettig

Team #12: Rowing Device for Canoe

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Objective Statement

Design rowing device to provide person with cerebral palsy inclusion and perception of active involvement in the action of rowing.

Background Information

- Cerebral palsy – a neurological disorder caused by a brain injury during the development of a child’s brain
- Affects the muscular system making adaptive technology necessary for daily activities
- Device will be used for the annual Canoe Day hosted by McMains Children’s Developmental Center

Safety Considerations

Issue	Solution
Stability	Stabilizing bar
Rotating parts	House/shield
Restrictive	Won't limit user's motion

System Overview

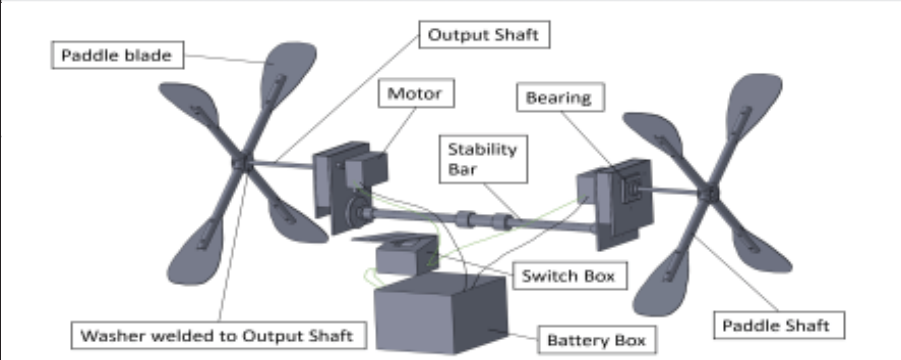


Figure 1: Statics analysis (total deformation)

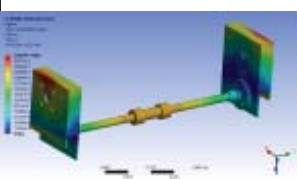


Figure 2: Total deformation with load (150lbs)

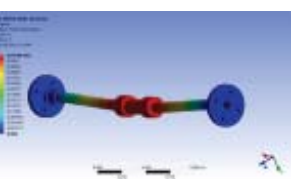
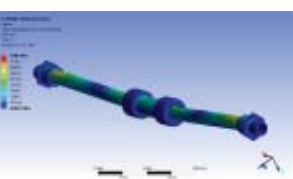


Figure 3: Von-Mises stress with load (150lbs)



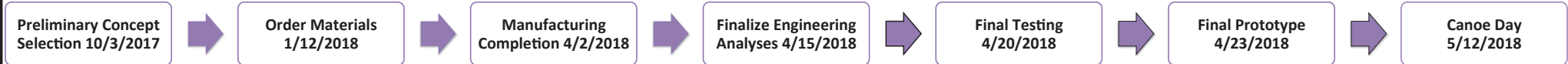
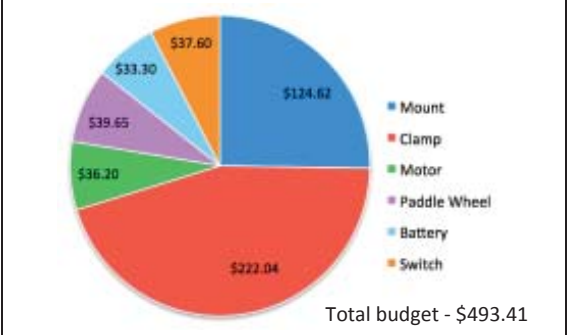
Testing Results

Objective/ Specification	Target	Result
Max System Weight	100 lbs.	35 lbs.
Assembly Time	< 15 mins	11 mins 45 sec
User Input Distance	< 10 in	8 in
Input Force Limit	< 15 lbf	1 lbf
Weight Capacity on Bar	150 lbs.	205 lbs.

Human Subject Feedback

- **Engaging:** “Device is fun and entertaining to use with minimal effort.”
- **Ease of Use:** “Input switches are straightforward and logical.”

Project Budget and Spending



Sponsors: Exxon Mobil, Jack Rettig, Elissa McKenzie

Advisor: Dr. Warren Waggenpack