# Nautical Engineered Resistance Device

## ME463 Fall 2016

FREESTYLIN'

PURDUE MECHANICAL ENGINEERING

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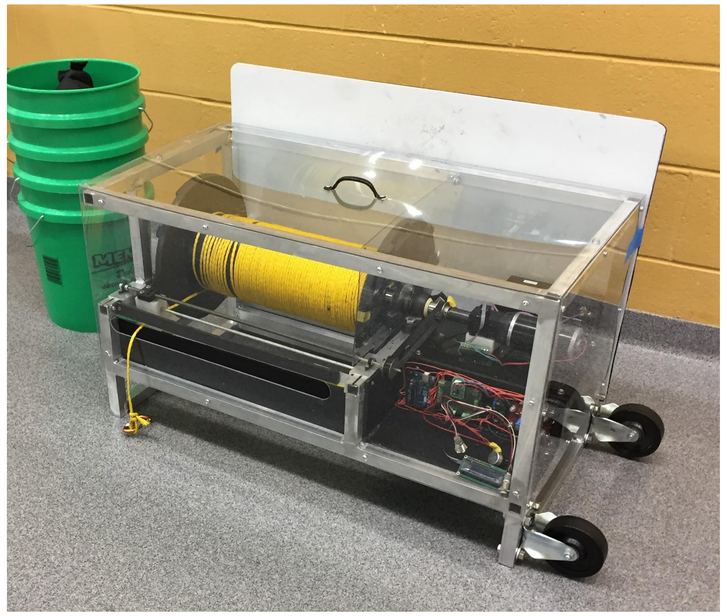
## Mission Statement

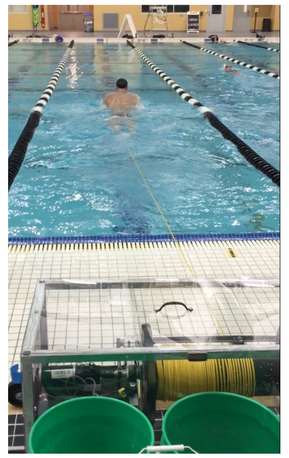
**Goal:** Improve upon current devices that apply a resistive force to a swimmer for strength training and form analysis

**Improvements over competitor:**

- Consistent resistance
- Variable resistance settings
- Performance feedback
- Improve safety
- Greater portability



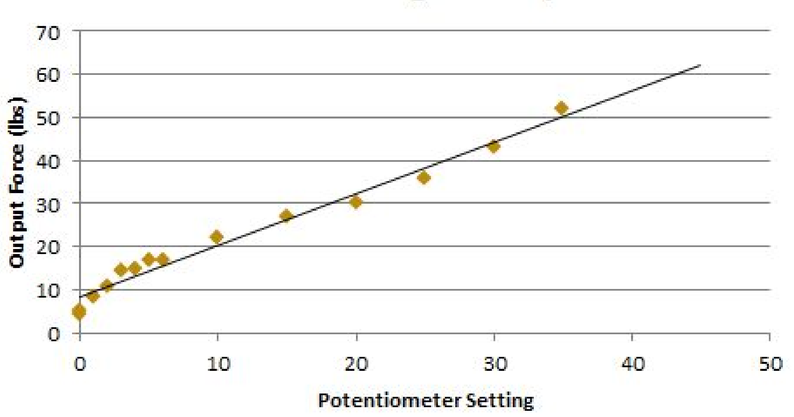
## Testing



**User Quote:** "[The force] feels more sustained than Power Tower."

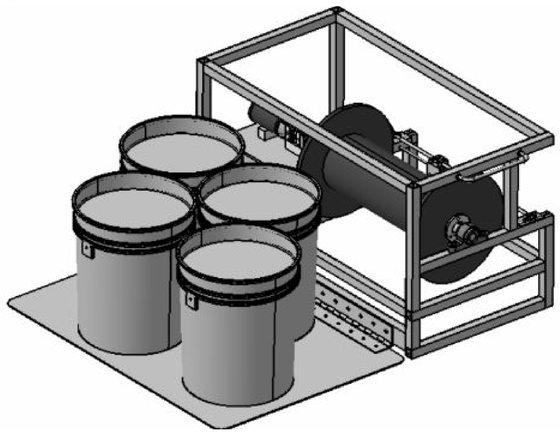
**User Quote:** "I really like it. You can't do this on a Power Tower."

**Potentiometer Setting vs. Output Force**



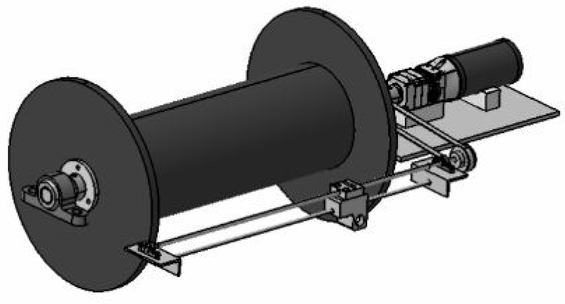

## Design Specification

**Weight:** 60 lbs
**Size:** 35"x18"x19"
**Set-up Time:** 2 minutes
**Force Applied:** 0-45 lbs
**Data Feedback**: Time, Force, Velocity
**Battery Life:** 80 cycles (minimum)
**Swim Time**: 15-25 seconds (25 yards)
**Respool Time**: 20 seconds



## Design Features

- DC motor applies a resistance to spool
- Current sensor controls resistance
- LCD screen displays performance feedback
- Lead screw facilitates even respooling
- Water buckets secure device to pool
- Wheels and handle allow the device to be portable similar to a wheelbarrow
- Easily accessible & rechargeable battery



## Marketability

**Cost of Prototype:** $900
**Resistance Devices In Use By Purdue:** 10
**D1 Collegiate Swim Teams:** Over 200
**Potential Markets:**

- Collegiate Swim Teams
- High School Swim Teams
- Swimming Clubs