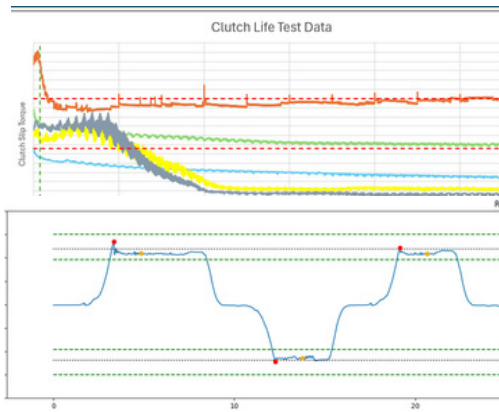# MYLES PRATT

MECHANICAL ENGINEERING AT THE MILWAUKEE SCHOOL OF ENGINEERING

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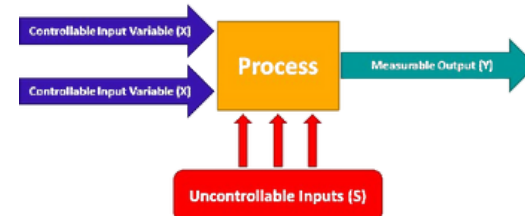
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NPD CLUTCH GEARBOX ANALYSIS *Regal*Rexnord

Clutch Life Test Data

Blurred For Confidentiality

What?

- Analyzed trends between NPD clutch gearboxes undergoing 10,000 cycle life tests.
- Discovered connections between six unique variables including gear material, clutch design, and lubrication applied.
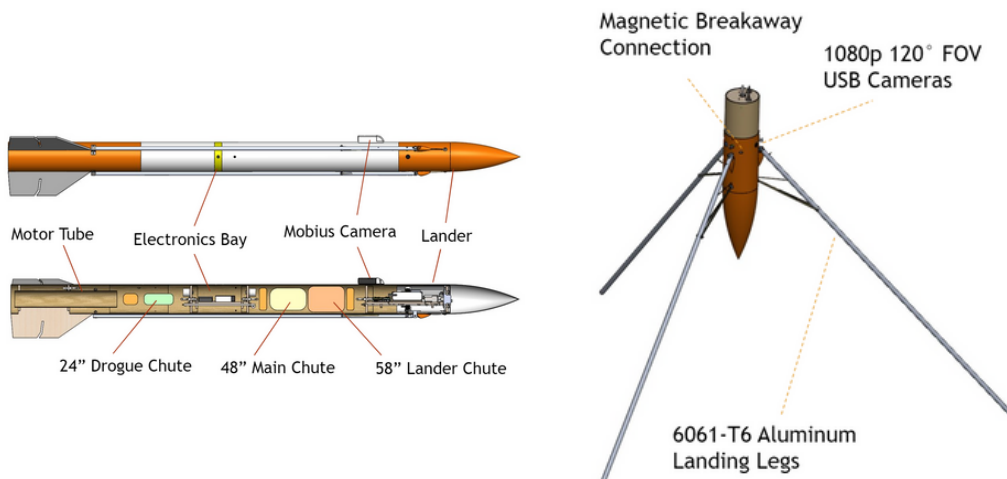
How?

- Used **Python** to clean up, convert and combine large files of test data into presentable graphs.
- Created an organized **Excel** sheet with the slicer tool pairing Lifetest graphs with disassembly pictures making it possible to compare data side by side.
- Presented full data analysis to NPD Gear Innovation Team.

Results

- Successfully narrowed down an ideal gear material for development
- Created a structure and plan for a Design of Experiment (**DOE**).
- Exited "Investigation" stage 2 of development and entered "Feasibility" stage 3,

ROCKET DESIGN MSOE

Motor Tube   Electronics Bay   Mobius Camera   Lander

24" Drogue Chute   48" Main Chute   58" Lander Chute

Magnetic Breakaway Connection   1080p 120° FOV USB Cameras

6061-T6 Aluminum Landing Legs

What?

- **Objective**: ·Design a Dual-Deploy Rocket that releases a probe at apogee (3000 ft), and lands on deployable legs, taking a 360° panoramic photo of the surrounding area.
- Collaborated with a small team of six.

How?

- ·Designed the internal electronic bay on **SolidWorks**, creating a modular system of **3D printed** casings to hold electronics in place undergoing 9 G's of force in initial takeoff.
- Aligned the fins of the rocket for precise design and performed preliminary ejection tests.
- Used **Rocksim** and **MATLAB** to predict flight and stability.

Results

- Probe successfully deployed at apogee.
- Film of launch was obtained from constructed camera mount.
- Voted best presentation by the competition and had a successful flight
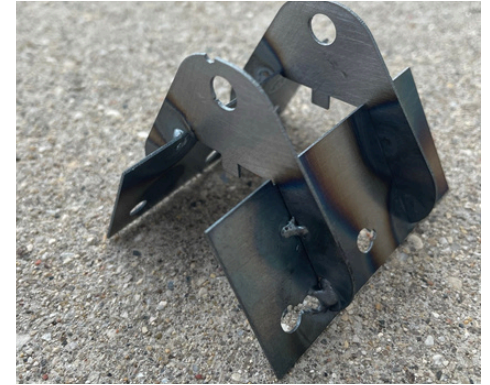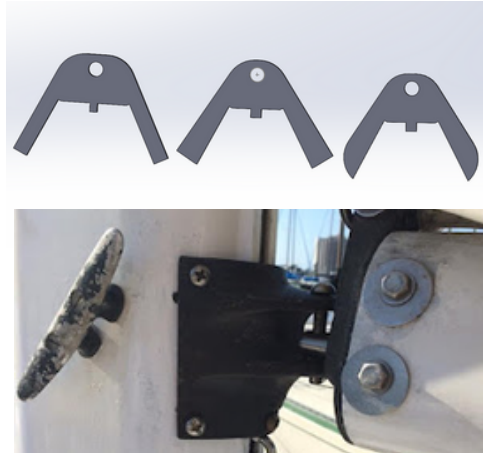
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MAST-BOOM SAILBOAT CONNECTOR ⛵

What?

- ·Designed, prototyped, and manufactured a swivel gooseneck mechanism for the Ensign (22ft long) boat fleet at a nonprofit community sailing center..
- Validated work with a University Professor.

How?

- Designed three unique prototypes on **SolidWorks.**
- Researched and analyzed different materials based on strength and price before settling on stainless steel.
- **Laser cut** and welded steel prototype for precise geometry.

Results

- Validated design with a Mechanical Engineering Dept Professor (shown above).
- Design allows for the horizontal part of sail (boom) to connect to vertical part of sail (mast).

LIGHT SWITCH SEEKING ROBOT MSOE
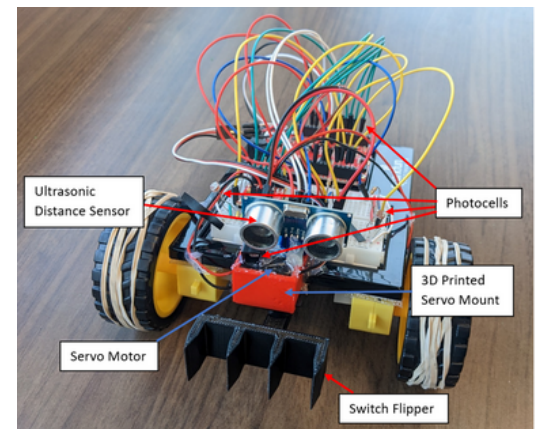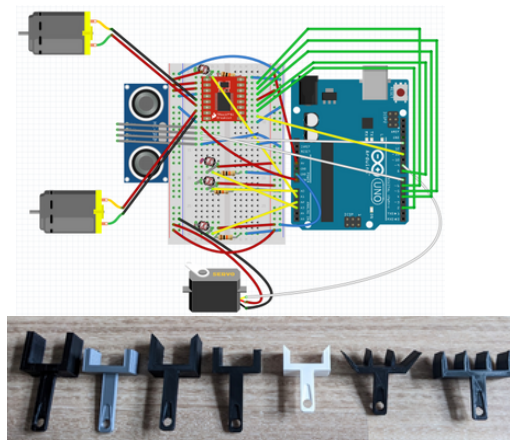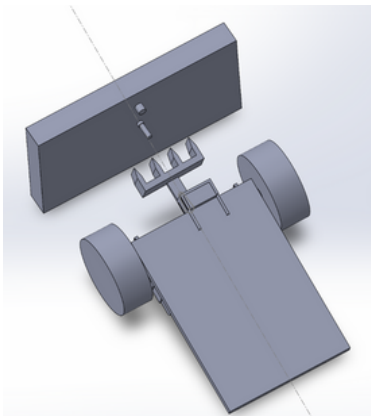
What?

- Designed, coded, built and competed in a light seeking robot competition.
- The robot locates a light, maneuvers to it, and flips a switch to turn on a new random light in a 1x1 meter arena.
- Worked in a team of 2

How?

- Worked with **SolidWorks** and **Arduino** paired with **MATLAB** to design an Arduino powered robot.
- Developed 7 unique **3D printed** prototypes for the switch flipper arm.
- Optimized code for quick adjustable steering of robot.

Results

- Successfully flipped 10 switches in 2 minutes.
- Tracked distance data and plotted on **MATLAB** once completed.
- Achieved a 97% success rate in flipping a switch on the first try.