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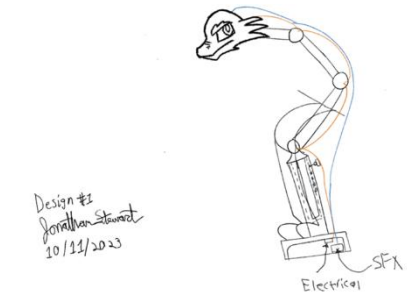
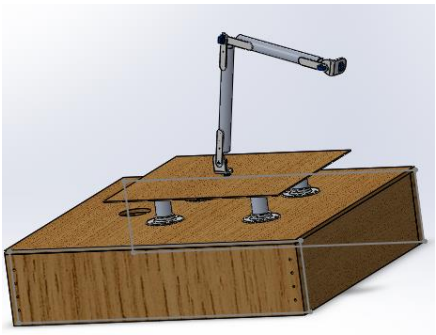
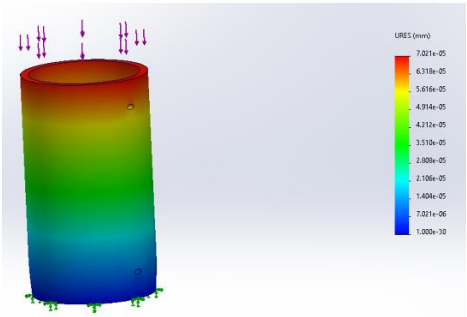
Senior Design Project: Animatronic Dragon







What?

Collaborating in a group of 4 mechanical engineers in designing and manufacturing an animatronic dragon neck and head over a 9-month period. The sponsor asked for the dragon to have realistic articulation, max height of 5-feet, max weight of 50 Lbs., Audio/Video integration through an Oculus Quest II or HTC Vive, and special effects integration via a fog machine.

My Contributions

- Lead conceptual designer and developed my design sketches utilizing **Procreate** and utilized Pugh charts to evaluate the purposed design.
- Lead in CAD modeling and blueprinting within **SolidWorks** related to mechanical and structural elements of the Animatronic Dragon's neck and base.
- Calculated the estimated velocity based on comparing calculated results
- Evaluating our existing design utilizing **optimization and design studies**, **DFMA, DFC,** and integration of **GD&T** within **SolidWorks** to conduct **FEA.**
- Reviewed relevant industry standards from **ASME** and **ASTM F24** (ASTM F770 – 18 and ASTM F1193 – 18) as it relates to the dragon's Manufacturing and operation.

Robotics and Automation in the Themed Entertainment Industry

What?

Researched the impact and applications of robotic and automation systems within the themed entertainment industry. Then picked a system to work on modeling and analyzing the system utilizing MATLAB and Simulink to find the optimal trajectory and control system.

Results

Analyzed the system utilizing the MATLAB Robotics toolkit, while learning the core concepts of various trajectory paths and control methods. We compared classic analog control with modern control systems using task and joint space trajectories. Our findings suggest that for themed entertainment industry robots, such as a ride control system would be optimally controlled utilizing a joint space with min jerk trajectory program.