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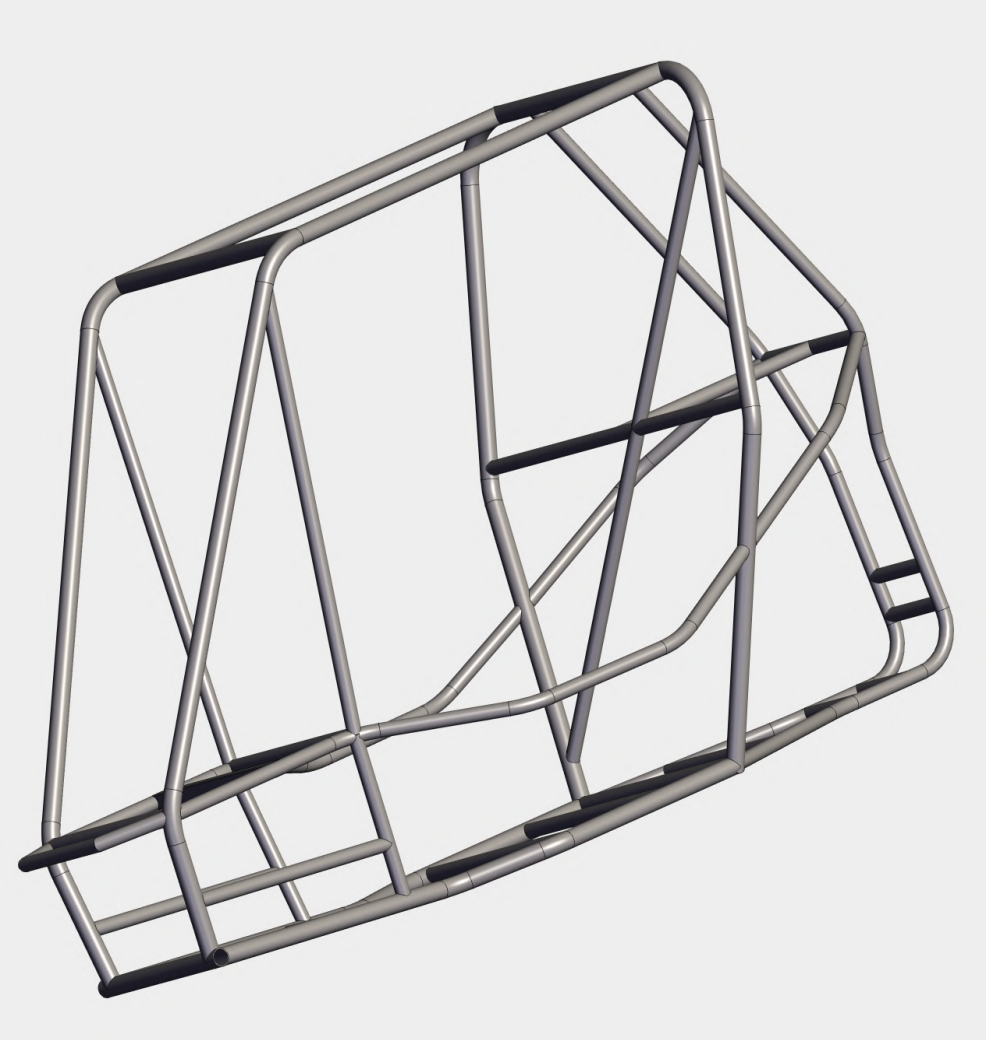
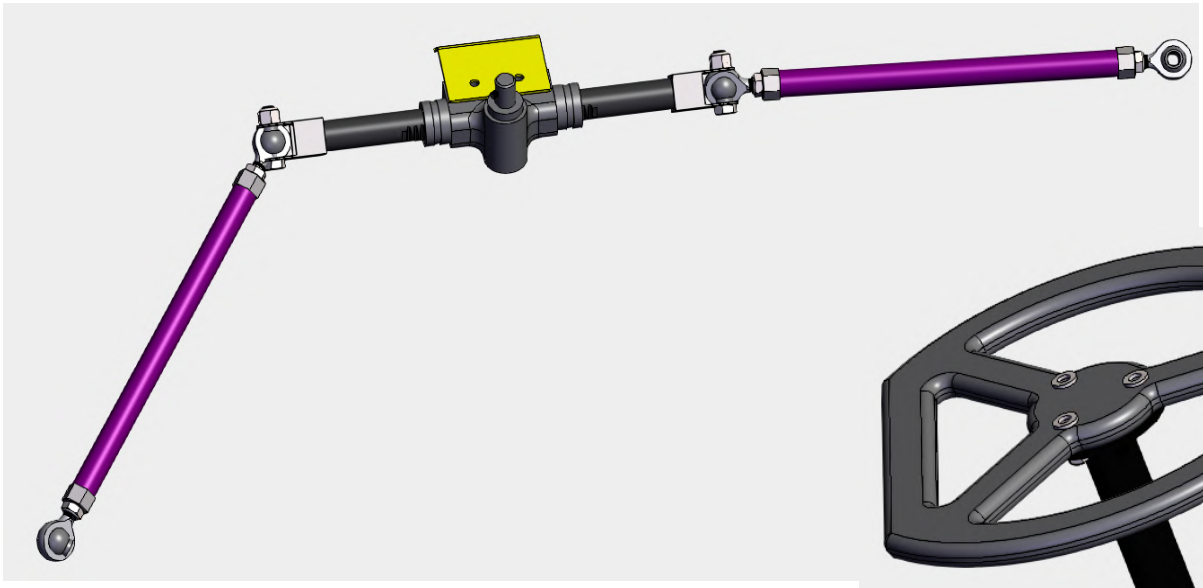
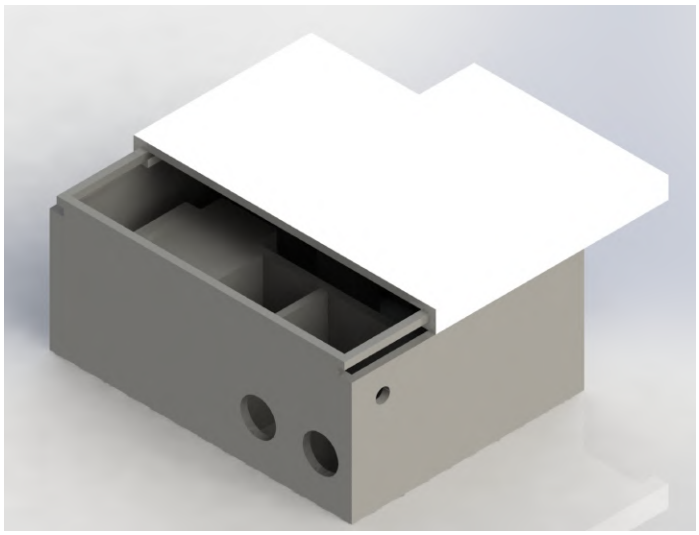
Baja - Research and Design (3 months)

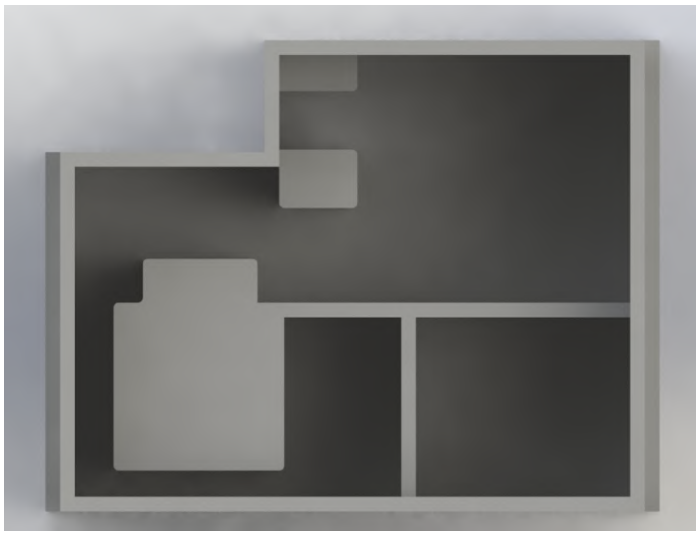
- Involved in the Baja SAE waterloo design team working to build a 4-wheel off road vehicle
- Vehicle will compete in international 2023 Baja SAE competition in a variety of competitions that will test the vehicle's performance, drivetrain, suspension, traction and much more
- Worked with another chassis team members to CAD the chassis using weldments (Solidworks)
- Repurposed previous years steering system to work with new chassis design
- Currently in charge of researching potential rims/tires and subsequently designing mounting hub to connect to the drive shaft
    - Considering factors such as weight, material, rim size/diameter, wheel offset, tire ply etc. on the performance of the car

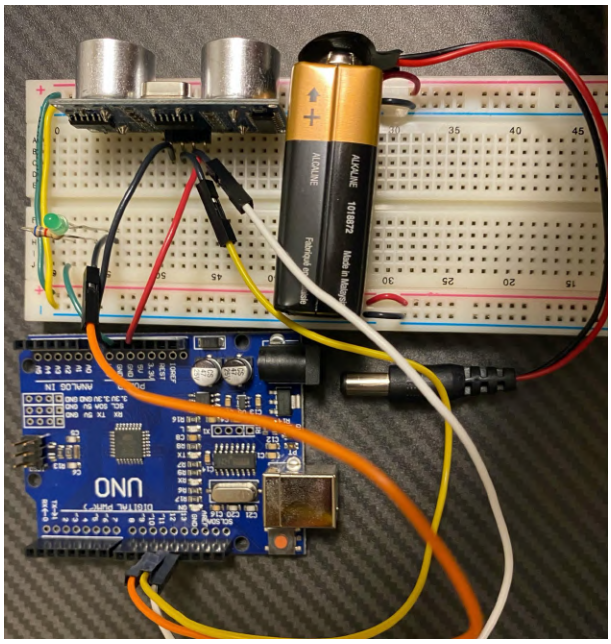


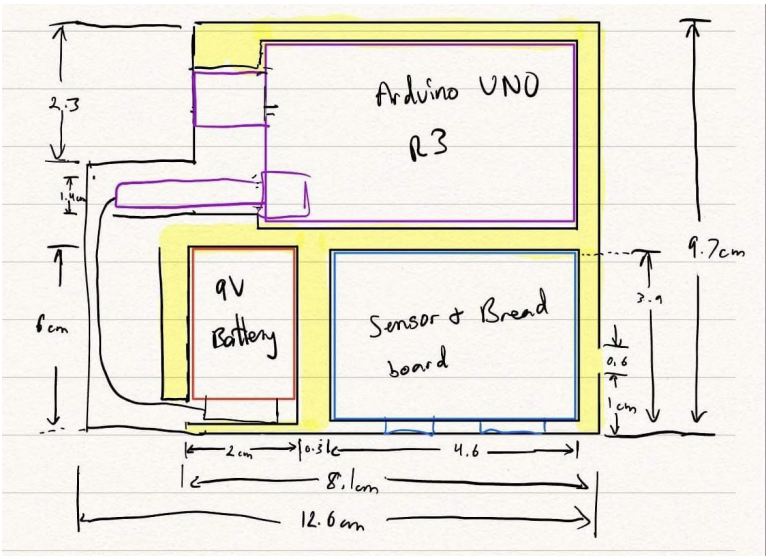


Smart Park - Parking Collision Detector





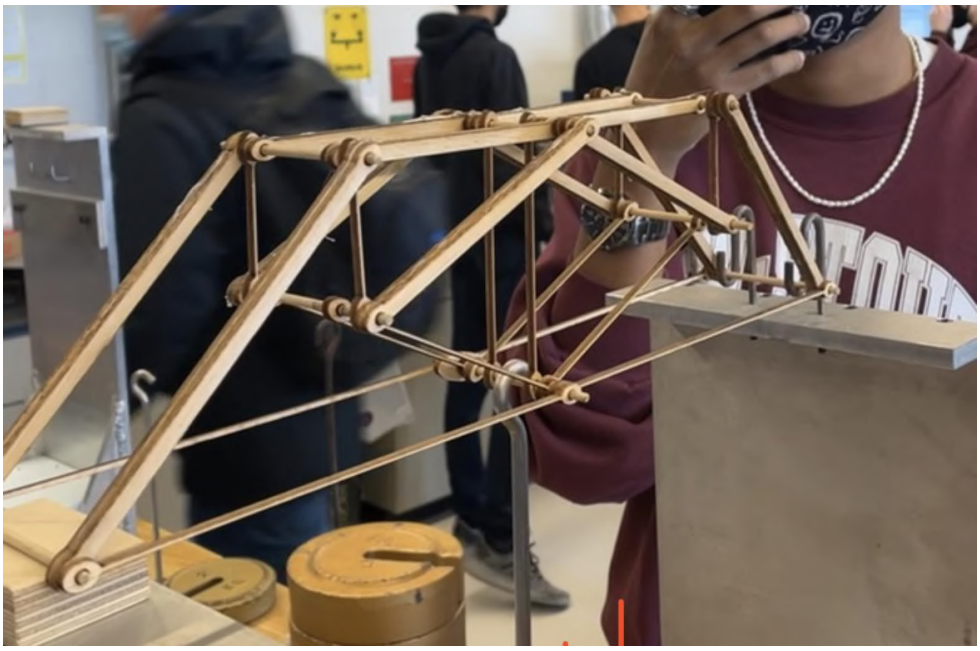




- Created inexpensive parking device to make parking easier after hitting the curb
- Used Arduino Uno, HC-SR04 ultrasonic sensor and LED to continuously detect and signal when an object is within 50cm accurate within 0.05 cm
- Designed a minimalistic casing to house the electrical components safely and securely and mount to car front bumper using Solid works
- Performed a Granta material analysis to determine optimal material type to withstand debris, sudden impacts (if it falls off) while still being relatively cheap

Balsa wood Truss Bridge Competition

- Lead the design, construction and testing of a balsa wood bridge that was made to withstand the maxim load possible under specific constraints (varied supports, specific load points)
- Optimized bridge to bear 300% more weight over 3 design iterations through applying stress and mechanics knowledge learned in class
- Created efficient cad designs to minimize wasted balsa wood as there was a limit to the available balsa wood
- Used laser cutting technology to cut wood and assemble bridge
- Finished 7th place with efficiency of 394

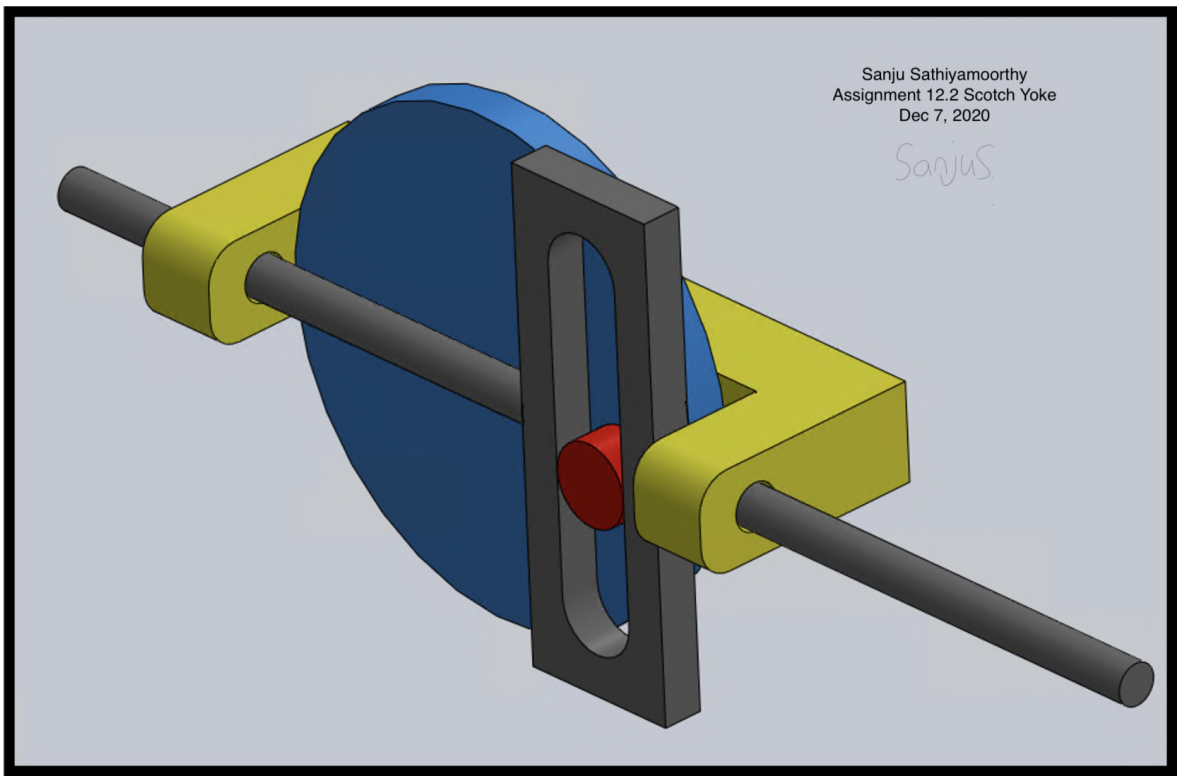


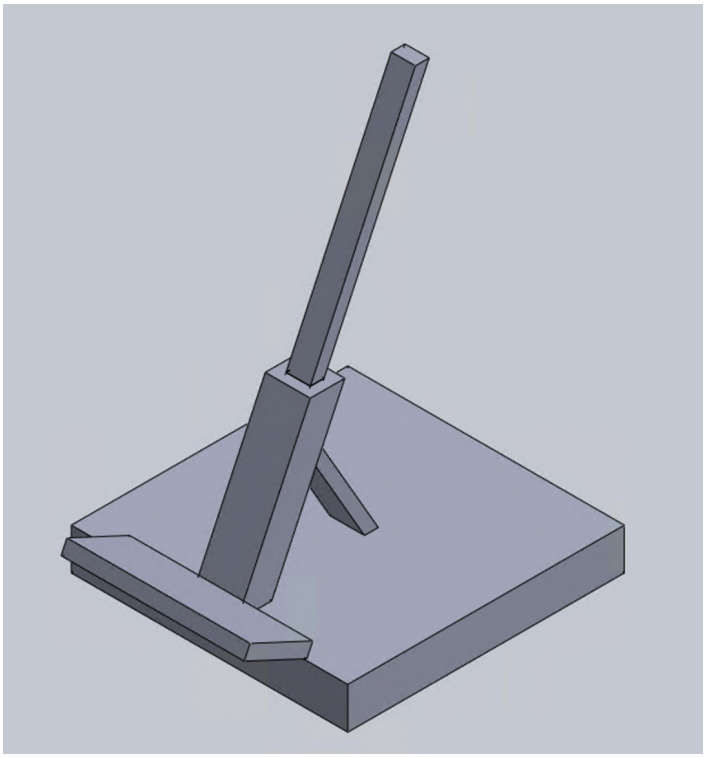
Odyssey - Created simple physics engine

- Designed, coded & published arcade video game from scratch using code block technology
- The game had its own physics engine (using dynamics and kinematics knowledge)
    - This was used to control the 2D motion of the player (spaceship), incoming rockets that followed the player and incoming lasers that had a constant velocity
- There used to be cool arcade music in the background but has been taken down by the side
- Click to play!

Reciprocating Motion Mechanism Design

- Used Solidworks to create the Scotch Yoke
    - a reciprocating motion mechanism that converts linear motion into rotational motion



Phone Stand Design:

- Designed a minimalistic phone stand to hold my phone upright to play music using solidworks