RBE550 - Homework 5

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Environment

This project was created and simulated in Unity. Thanks to the rigid body functions in Unity, the collision detection was handled in the environment. Please refer to video "TransmissionVideo" for the output. Figure 1 shows the 2D output of the RRT planning from the starting position to the first target position outside of the transmission cage. The gears were simplified into a single cylinder, largely to save time remodeling the main shaft and countershaft in Unity. The relative dimensions are the same, though.

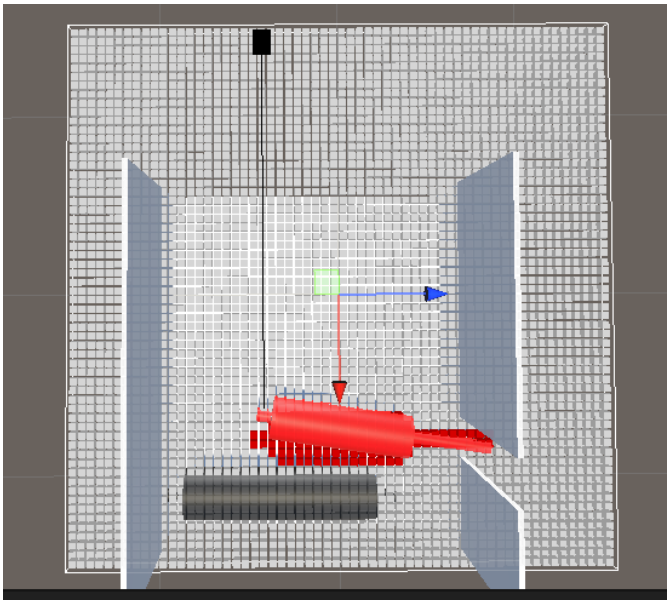

Figure 1: Image of RRT output

I don't know much about transmissions, so in lieu of a picture of the ugliest car with the SM465 transmission, I have elected to include a picture of the 1964 Chevy Corvair, the subject of the 1965 book "Unsafe at Any Speed: The Designed-In Dangers of the American Automobile" by Ralph Nader. Nader was largely responsible for forcing American automobile manufacturers to begin designing around safety as opposed to just fun or function, and this absolute train wreck of a car helped to make it possible. The swing-axle suspension caused frequent "tuck-under" incidents leading to instability and accidents. Additionally, the car required tire pressures that were outside of the recommended pressure values from the tire manufacturers and had an odd weight distribution that made it extremely unstable around turns. Couple these issues with the lack of safety features like seatbelts and the 1964 Chevy Corvair was truly one of the worst designed vehicles of all time.

Figure 2: Image of 1964 Chevrolet Corvair Monza[1]

References

[1] Chevrolet corvair. https://en.wikipedia.org/wiki/Chevrolet Corvair. [Online; accessed 23-Apr-2023].