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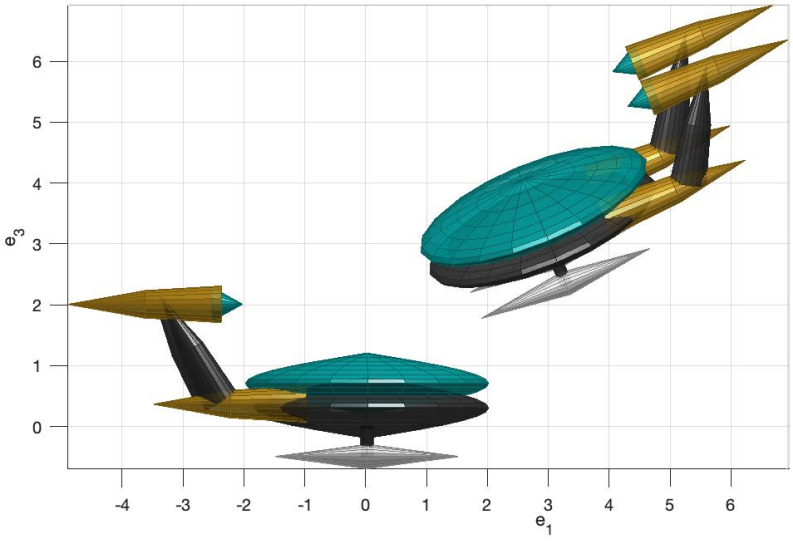
MATLAB CODE ON SPACESHIP



Changes in make_spaceship.m:

The positions of structures mentioned are in reference to the main object (trf_root).

The position of the top and bottom has been corrected by swapping the translation value. The color of the top dish and bottom dish was changed to [0, 0.75, 0.75] (light blue) and [0.25, 0.25, 0.25] (light black) respectively. The left tail was scaled downed in the x-axis by a factor of 0.75 and scaled up in the z-axis by 2.5. The same objected was replicated to create the right tail and put 2 units, towards the negative y-axis, away from the left tail. The support attached to the tails were also the same structure but rotated by pi/3 about the y-axis and scaled by different factors. The position of the supports were set to -2.5 units in the x-direction and 0.4 units in the z-direction. The position of the supports in y-axis is same as the position of the tails.

Similar to support, the engines were replicated using the tail but scaled by different factors and put to place using translation. The left and right cap poking out from the engine were created using the cylinder function with base radius of 0.4.

Addition of new structure:

Two landers were added to the spaceship using the cylinder function, rotated by pi/2 about the y-axis, which creates a structure with radius changing, uniformly, from 0 units, 0.4 units to 0 units. To join the landers with the bottom dish another supporting structure, a cylinder of 0.1 units, was added. The objects were simply translated to their position.

A pause command has also been added before the execution of trajectory function.

Addition of trajectory.m:

The entire trajectory has been divided into six parts i.e. loops. The change in counters in the for loop has been set such that the motion is uniform throughout the trajectory. It starts with the spaceship having increasing roll, pitch and yawn to simulate it turning 0.85pi about the z-direction. The roll and pitch is then neutralized back to 0 by opposite rotation but with decreasing rate to give it a natural motion.

Similarly, the spaceship is translated in the x-axis, initially, at a faster rate then slowed down and reversed to simulate the effect of slowing down. The same applies for translation in y and z direction but it isn't reversed. With each for loop, the coordinates come closer to becoming a constant. The order is z-coordinate, y-coordinate and then x-coordinate which makes the spaceship look like descending to a fixed altitude, making a turn to fixed y-coordinate and then stopping at a x-coordinate.

Finally, the trajectory ends with the spaceship coming down to a halt and landing on the ground.