2017/09/29

EECS 267 LAB1 - README.PDF - Yusuke Niiro

//Description

This is a clock system I made with 27 gears, 13 shafts and 1 linear gear by using SIG. You can change the speed of gear27(second hand) by changing the parameter of variable “speed” in “run_animation( )” of “my_viewer.cpp”.

<essential gears>

-Gear27: second hand speed

-Gear11: minute hand speed

-Gear22: hour hand speed

//Processes

1) Made a function “make_my_gear” that makes a gear. Use this function to make my main gear.
   Ex. Gear2, etc.
2) Made a function “make_my_gear_cs” that makes a different size gear with same teeth with particular gear size. Use this function to make other gears.
   Ex. Gear1, etc.
3) Made functions “make_my_cylinder” and “make_my_cylinder_hole” that makes cylinder and cylinder has a hole in the center. Use these functions to make shafts of this system.
   Ex. Shaft1, Shaft3, etc.
4) Made functions “make_my_cylinder_cs”, “make_my_hand” and “make _my_clock” that makes a hand of clock and design of clock. Use these functions to make materials for the clock object.
   Ex. Plate1, Hand1, Clock1, etc.
5) Made functions “make_my_belt” and “make_my_cube” that makes a one tooth of linear gear and a cube. Use these functions to make a linear gear system.
   Ex. Belt1, Cube1, etc.
6) Configuration: Use scene graph to put materials in right position.
7) Animation: Use the right parameters to move gears, shafts, linear gear and

clock. Calculate the right parameters of gears by using ratio of two gears that move together. Calculate the right parameters of linear gear by using ratio of translation and rotation.

//Functions

make_my_gear: Use parameters of radius, thickness and radius of inner circle to make a gear.

make_my_gear_cs: Use parameters of radius, thickness, radius of inner circle and radius of particular gear that you want to use as teeth to make a gear.

make_my_cylinder: Use parameter of length to make a cylinder.

make_my_cylinder_cs: Use parameters of length and radius to make a cylinder.

make_my_cylinder_hole: Use parameters of length, inner radius (radius of hole) and outer radius (radius of cylinder) to make a cylinder.

make_my_hand: Use parameters of length and width to make a clock hand.

make_my_clock: Use parameters of radius of clock and angle of clock design to make a clock design.

make_my_belt: Use parameters of number of teeth and thickness to make a linear gear.

make_my_cube: Use parameters of width and thickness to make a cube.

//Evaluation

Measure the time it takes to build materials that I made by putting “gs_time( )” in the “main.cpp”, and compare the time it takes among different group of materials.

(Average Building Time: Average of 30 samples)

Table1: Evaluation Table (Mac Book Air - Intel I7)

Group of Materials	Average Building Time	Number of Materials	Number of Triangles
1) Clock Object	0.16836	6	690
2) Gears	0.19018	51	46656
3) Shafts	0.17642	13	9160
4) Linear Gear System	0.18292	33	1644
5) ALL	0.20962	103	58150
6) NOTHING	0.14352	0	0