Exercices 8

November 17, 2022

a) Implementation of a virtual TrackBall

Download the Laboratorio8_TrackBall_Studenti.zip project from virtuale.unibo.it and implement a virtual trackball that activates when the user moves the mouse over the viewport with the left button pressed.

To manage this event, the glutMotionFunc(mouseActiveMotion) call must be inserted in the main which registers the mouseActiveMotion function written by the user as a callback function to the mouse moving event with the left button pressed.

Implement the function

```
vec3 getTrackBallPoint(float x, float y)
```

which, starting from the x,y coordinates of the mouse on the viewport, constructs the position of the mouse on the hemisphere.

Implement the function

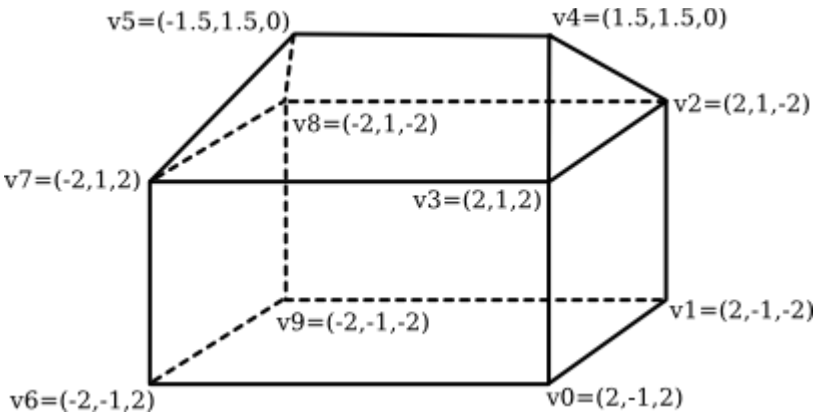
```
void mouseActiveMotion( int x, int y)
```

which, starting from two successive mouse positions, generates the direction and angle by which to rotate the camera, making use of quaternions.

b) Download the Laboratorio8_Snowan_Studenti.zip project from virtual.unibo.it.

Add to scene

the house identified by the following geometry



1) Inside the geometry.cpp file (and therefore geometry.h), implement the function

void create_home(Mesh* mesh, old4 color_t, old4 color_b)

which memorizes the vertices of the house in the order indicated in the figure and specifies successive triads of indices which identify the various triangular faces

Add geometry for a door and window.

1) Add 81 snowmen in a regular 9x9 grid to the scene.

2) Place the house inside the scene with the various snowmen. Place a waving flag near the house.

3) Model a character of the type in the figure, suitably assembling the primitive surfaces cube, cone, sphere, cylinder, etc.