

3D Game Programming
Lab Exercise

Compile and build programs in Release mode. Run a program in `/bin/release`.

Implement the programs in the folders `p1`, `p2`, etc.

p1. Create a plane, a set of spheres and a robot on a floor. Put the camera above the floor and let it view the scene orthogonally.

The positions of the spheres are randomly generated. Assign materials to the objects.

A user presses 'w' to control the robot to move forward. The movement direction of the robot is controlled by the mouse.

Hint: You can use two cameras. Use one camera (registered for camera control) to view the scene from the top and use another one (registered for camera control) to change the viewing direction of the robot.

Steps:

CreateScene:

1. Create spheres. Create the scene nodes and entities. Load the sphere mesh for the entity.

2. Create a robot. Create a scene nodes and an entity for the robot.

Set the speed s of the robot.

Note: recall that speed is the magnitude of velocity.

Animation:

1. compute robot movement direction d (unit direction)

d is computed as:

get camera direction dc

then $d = (dc.x, 0, dc.z)$

(*Note: remove the y component as the robot move on the plane, neither moving upwards nor downwards)

normalize d

2. check if key 'w' is pressed

Yes: Let p be the position of the robot

Update p as: $p = p + s*d*time_step$

(So, $s*d$ is the velocity of the robot)

Enjoy programming.