
Practical Assignment 3 - Rigid Body simulation

The main objective is to implement a rigid body simulation. To simplify things, only one object will be simulated, a cube. It has to start at a random location, with a random orientation inside the simulation box. At the start, a random ascending force is applied to some random point within the cube (doesn't have to be one of the cube's vertices, necessarily). The other force in action is gravity.

The intended result is a rotating cube in air which collides with ground and walls, responding adequately.

After the simulation runs for 20 seconds, it should reinitialize: the cube again at a random location within the simulation box and a random ascending force applied to it.

The simulation box has dimensions $[-5, 0, -5] \times [5, 10, 5]$. The framerate is already fixed to 30fps, so each frame should simulate 33.3ms.

1. Create the render of the cube. (2pt)

GLFramework has a GL Core Profile, you'll have to use VBOs and shaders. Take a look at how the other primitives are created and used.

2. Simulation of the cube's rigid body motion. (3pt)

Use the Semi-Implicit Euler solver. Recommended use of quaternions with the glm library.

3. Collision with walls and ground planes.

- (a) Collision with the ground. (2pt)

- (b) Collision with all other walls. (4pt)

As part of the deliverable, write a short document (max. 2 pages) explaining your design and implementation decisions.

ATTENTION

This Practical Assignment will be delivered in two parts:

- Just the cube's render. Due to 18/04/17 at 23:55.
- Whole assignment. Due to 07/05/17 at 23:55.

I'll provide the cube's render on 19/04/17 for those of you that don't deliver it, but take into account that you will have forfeited the points from the cube render item of the assignment.