Centre adscrit a: UNIVERSITAT DE BARCELONA

Practical Assignment 2 - Cloth Simulation

The main objective is to implement a cloth simulation using a particle-spring mesh of 14 x 18 points within a simulation box, taking into account collisions with the walls, ground and a sphere. Consider each point as a particle (all particles with constant mass equal to 1 kg). All the points of the mesh should be animated except for two at the top, which should have a fixed position (points 0 and 13).

Initialize the position of the whole mesh such that it is horizontal at a initial height and make the position and radius of the sphere random.

After the simulation runs for 20 seconds, it should reinitialize: the mesh horizontal on top again and the sphere to some random location within the box with a random radius.

The rendering mesh is already implemented on the provided GL Framework with the default 14 x 18 vertices. The simulation box has dimensions [-5, 0, -5] x [5, 10, 5]. The framerate is already fixed to 30fps, so each frame should simulate 33.3ms.

1. Simulation of the whole mesh using your solver of choice (Euler or Verlet). (4pt)
2. Collision with walls and ground planes. (2pt)
3. Collision with the Sphere. (2pt)
4. Make the parameters tweakable from the GUI. (2pt)
    - Constant and damping term of direct-link springs (stretch).
    - Constant and damping term of diagonal-link springs (shear).
    - Constant and damping term of second-link springs (bend).
    - Max % of accepted ellongation of links.
    - Initial Rest distance of the springs between the points of the mesh.

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