Centre adscrit a: UNIVERSITAT DE BARCELONA

enti ESCOLA DE NOVES TECNOLOGIES INTERACTIVES

Practical Assignment 1 - Particle Systems

The main objective is to implement a particle system with two different types of emitters: fountain and cascade. Their parameters have to be user-adjustable as well as the emission rate (not less than 100 particles per second) and particle life expectancy (not less than a second). The simulation will have to run inside a box of dimensions [-5, 0, -5] x [5, 10, 5]. The framerate is fixed to 30fps, so each frame should simulate 33.3ms. All options have to be tweakable from the GUI.

- (**Mandatory**)
  1. Use two Solver methods: Euler and Verlet. (3pt)
  2. Add elastic and friction coefficients. (2pt)
  3. Implement collision detection with walls and ground planes. (2pt)
  4. Implement collision with some object(s) within the box:
     - A Sphere. Make its position and radius parametrizable. (1pt)
     - A Capsule (Optional). Make the position of its points and radius parametrizable. (1pt)
- (**Optional** (1pt)) Create a point in space that creates a force field affecting the particles. This force field has to be able to change as an attractor, a repulsor or make a pulse effect (a periodic intermittent repulsion).

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