EECS 351 Project A Report

Project Name: Particles forming themselves in tornado, boids, flame, sphere, etc.
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User Guide

Open the html file to run and view the project. You can see particles bouncing in an invisible box.

- You can press R to apply force on them.
- You can use WSADQE to tilt camera.
- You can move by YHIKJL, YH for forward/backward, IKJL for horizontal and vertical.
- You can use numkey 1-5 to switch models. Particles will change their actions into
    - 1. bouncy balls, limited in a box
    - 2. spring sphere
    - 3. flame, under a invisible sphere, which will obstruct the flame going up, in this model there's also random wind
    - 4. tornado
    - 5. boids
- You can use ZXC to change solvers. Solvers are:
    - Z: euler solver
    - X: mid-point solver
    - C: verlet solver
- Also, M is for switching explicit / inplicit.

Extra Forces in this project: SPRING, REPULSION, ROUNDING, CENTRIPETAL, BOIDS

Extra Constraints in this project: STAY, FIRE_RECREATOR, WIND_RANDOMIZER, TORNADO_RECREATION, BOIDS_LEADER, SPHERE

Solvers in this project: Explicit / Implicit Euler, Explicit / Implicit Mid-point, Verlet Solver

Code Guide

- `lib` directory contains all library code provided by starter code
- `FangJianyou_ProjA.js` is the main js file that defines vbos, models, particle systems, etc..
- `VBOBox.js` contains code for VBOBox. The structure enables user to define models outside the class and render outside the class. It will call a callback function when updating. I'm quite proud of this structure for it enables me write different VBOs without writing duplicate codes (defining VBOBox1 class, VBOBox2 class, etc.).
- `Camera.js` I separated this at 351-1 to make a better camera controlling class.
- `ShapeBuilder.js` The shape manager for user. I separated this out for avoiding long code in VBOBox.

- `particle.js` This is the file describing particle system. It contains all classes needed to build up a particle system. Including Particle(state of the particle), Force (the forcer), Constraint, ParticleModel, and ParticleSystem.
- `materials_Ayerdi.js` Starter code from 351-1 for materials, not so useful in this project.
- `FangJianyou_ProjA.html` The HTML file for the project.
- `FangJianyou_ProjA.css` The CSS file for the html.

Results

- Webpage will shown as Figure 1 when html file is opened
- Figure 2 shows state after tilting & moving camera
- Figure 3- 6 shows all the models available to switch

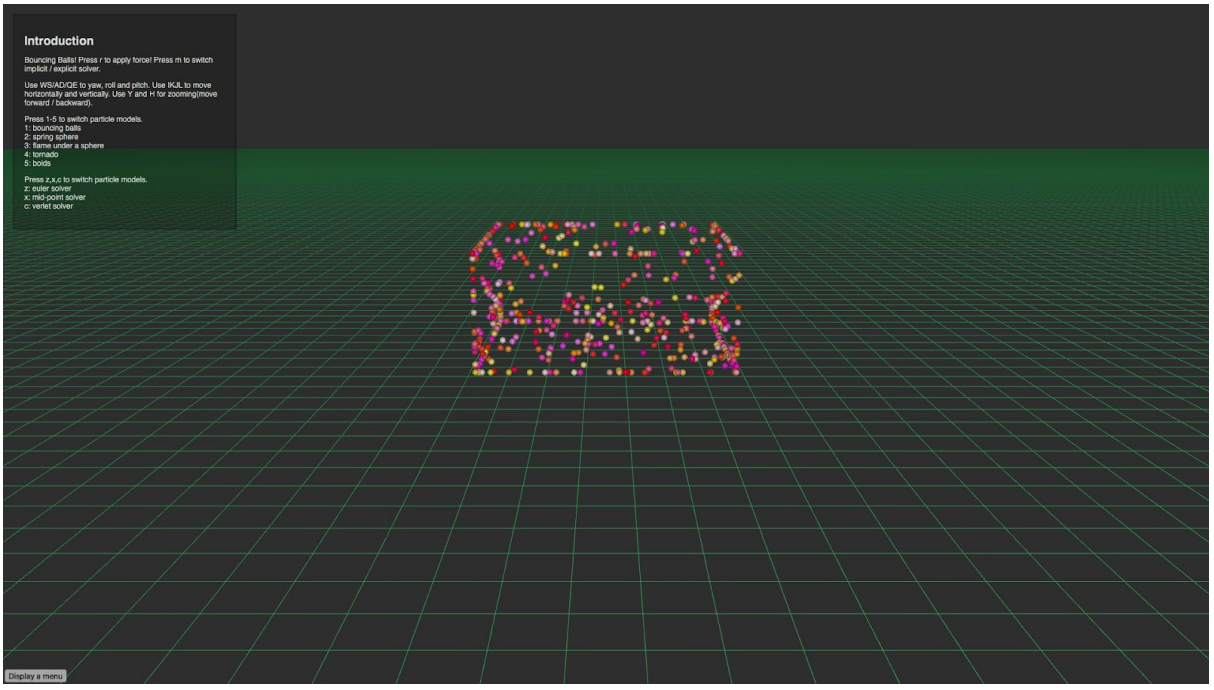

Figure 1. Initial State

Figure 2. State after tuning camera

Figure 3. State after changing model to spring sphere

Figure 4. State after changing model to flame

Figure 5. State after changing model to tornado

Figure 6. State after changing model to boids