

Processing Particle System

Ting-Chun Sun

tingchun.sun@usc.edu

Platform

PC/Processing.

Description

This system can load .txt file to simulate a virtual scene by utilizing particle systems, force fields, and collision planes. The following is the format of the specification file.

oType(1) pType pPX pPY pPZ pVX pVY pVZ pCount pMinLifespan pMaxLifespan pMinCR

pMinCG pMinCB pMaxCR pMaxCG pMaxCB pMinSize pMaxSize

oType(2) fType(1) fMagnitude fVX fVY fVZ

oType(2) fType(2) fMagnitude fVX fVY fVZ fRandomness

oType(3) cType cA cB cC cD

oType: Type of object. 1 is particle system, 2 is force field, and 3 is collision plane.

pType: Type of particle system. 1 is water.

pPX, pPY, pPZ: Position of particle system. Float.

pVX, pVY, pVZ: Initial velocity of particle. Float.

pCount: Count of particles generated in one frame. Int.

pMinLifespan, pMaxLifespan: Lifespan of particle. Int.

pMinCR, pMinCG, pMinCB, pMaxCR, pMaxCG, pMaxCB: Initial color of particle. Float.

pMinSize, pMaxSize: Initial size of particle. Float

fType: Type of force field. 1 is gravity and 2 is wind.

fMagnitude: Magnitude of force. Float.

fVX, fVY, fVZ: Direction of force. Float.

fRandomness: Randomness of force direction. Float.

cType: Resulting behavior of collision plane. 1 is bounce, 2 is stick, and 3 is die.

cA, cB, cC, cD: Parameters of collision plane equation ($ax+by+cz+d=0$). Float.

Moreover, there are few keyboard commands for user interaction.

[w]: Turn on or off the wind forces (if specified in file).

[1]: Load fountain.txt.

[2]: Load waterfall.txt.

Extra Credit

Collision detection with inclined planes.

Future Work

Implement more types of particle system and force field. And of course, show more impressive simulations, e.g. fire or smoke.

Demo

<http://www.cs.nctu.edu.tw/~dingjun/ProcessingParticleSystem/index.html>