Project Proposal for

Particle Systems

from

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This proposal is to initiate my project which is to create and develop further area in particle system in computer graphics.

Introduction

The particle system is one of the techniques in game physics, motion graphics, and computer graphics. It is basic representation of physic-based animation that computes force, velocity, and position of the particle. It gives visual effects with graphic objects which we called, “particle.” The particle system has been applied to simulate a fire, a galaxy, or even a bomb explosion. It can be applied to represent numerous visual effects. The particle system is one of the important techniques in computer graphics, as it is mentioned in previous studies [Reeves, “Particle Systems—A Technique for Modeling a Class of Fuzzy Objects”, 1983]. To effectively use this technique, it is important to know the relationship between particles and attributes (position, velocity, force, mass, etc.). Even though there are many studies over this technique, I chose this as my final project, because this is related to my research area. Therefore, I want to focus on studying the effects of force and quantity of particles on the particle system.

Objectives

- To implement then represent the particle system visually
- To be able to determine which force can give which visual effects in particle system
- To be able to explain the relationship between particles and attributes (mentioned in Introduction section)
- To be able to explain the concept and implementation of the particle system

Research Question(s)

1) What is the particle system and how do I implement it?
2) What is the effect of type of force on the particle system?
3) What is the effect of quantity of particles on the particle system? Will particle system look like fluid if there are too many particles? If so, how can I determine the average amount of particles?

Plan of Work & Time Schedule

Task 1: Research (1 week)

- What kind of programming languages should be used.
- What kind of environment should be installed.
- What is the particle system.
- What kind of knowledge and steps would be required to implement the particle system.

Task 2: Implementation of Particle System (2 weeks)

- What kind of force should be added.

- How many quantities of particles would I want to test with the particle system.
- How many attributes would I want to add to create the particle system.

Task 3: Testing (1 week)

Tasks	**Date of Tasks (by Weeks)**			
Task 1: Research				
Task 2: Implementation				
Task 3: Testing				
	5	12	19	26
	November			

Conclusion

The goal for this project is to fully understand the concept of the particle system then test the effect of each feature such as force, quantities of particles, etc. on the particle system. It is a one-month-long project to demonstrate the implementation of particle system. With this project, I expect to demonstrate the visual representation of the particle system, and how I can give effects on particle systems.