

# Research Journal

COMP220

1507866

November 16, 2016

## 1 Papers:

### 1.1 Design and Application of General Data Structure for Particle System

[1]

- The main properties of particle are:
  - spatial location
  - velocity
  - survival time
  - shape
  - size
  - gravity factor
- Properties change over time
- Particle system should:
  - initialise particles

- emit particles
- render particles
- eliminate particles

Paper mostly just gave a model for a particle system, could be helpful for breaking down the particle system into smaller user stories.

## **1.2 Illumination for computer generated pictures [2]**

- Textures and shadows make 3D graphics look more realistic
- Three light parts of light:
  - Ambient
  - Specular
  - Diffuse

Related papers:

- Blinn [3] - says Phong model not good for reflections

## **1.3 Particle Systems — a Technique for Modeling a Class of Fuzzy Objects [4]**

- Other papers refer to this as original paper on Particle Systems
- Particle effects for dynamic/ fluid objects
- Particles can “live” and “die”
- Primitive/simpler shapes/models work better

Related papers:

- Pegoraro [5]

#### 1.4 Study on algorithm for fireworks simulation based on particle system [6]

- Chose paper as a particle effect for fireworks may relate to a fire particle effect
  - Particle systems used to simulate irregular objects
  - Uses lots of maths
  - Takes wind/other forces on the particle into account
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#### 1.5 The status quo and realization of Waterfall simulation based on particle system [7]

- Focuses on water simulation instead of fire
- Using physics to make particles more realistic
- Use collision detection to make more fluid / respond to environment

#### 1.6 Physically-Based Realistic Fire Rendering [5]

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Related papers:

- Will add papers from this papers previous research section

### References

- [1] X. Huang, D. Zhao, N. Li, and R. Xu, “Design and application of general data structure for particle system,” in *Computer Science and Electronics Engineering (ICCSEE), 2012 International Conference on*, vol. 1, pp. 489–492, March 2012.

- [2] B. T. Phong, “Illumination for computer generated pictures,” *Commun. ACM*, vol. 18, pp. 311–317, June 1975.
- [3] J. F. Blinn and M. E. Newell, “Texture and reflection in computer generated images,” *Commun. ACM*, vol. 19, pp. 542–547, Oct. 1976.
- [4] W. T. Reeves, “Particle systems—a technique for modeling a class of fuzzy objects,” *ACM Trans. Graph.*, vol. 2, pp. 91–108, Apr. 1983.
- [5] V. Pegoraro and S. G. Parker, “Physically-based realistic fire rendering,” in *Proceedings of the Second Eurographics Conference on Natural Phenomena*, NPH’06, pp. 51–59, 2006.
- [6] S. Lei and W. Wang, “Study on algorithm for fireworks simulation based on particle system,” in *Computer Science and Network Technology (ICCSNT), 2013 3rd International Conference on*, pp. 231–234, Oct 2013.
- [7] L. Shi and W. Wang, “The status quo and realization of waterfall simulation based on particle system,” in *2015 4th International Conference on Computer Science and Network Technology (ICCSNT)*, vol. 01, pp. 91–93, Dec 2015.