

Specialist Production Module

Renderman Ice Shader

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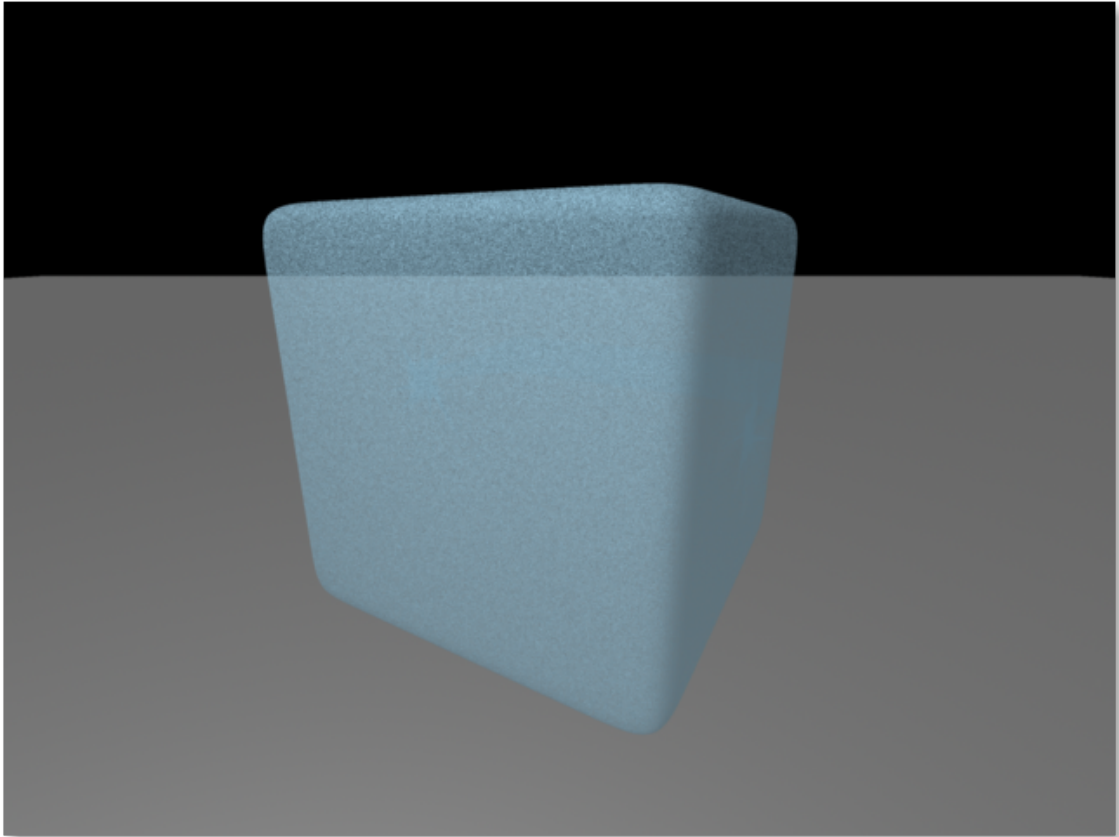
May 10, 2015

Project Overview

In this project I aimed to develop a *physically based **Ice Cube Shader*** in *Renderman Shading Language*.

Introduction	2
Initial Research	3
1.1 Experiments with real ice cube and light	3
1.2 Related research from other papers	3
1.3 So what exactly is Renderman?	3
1.4 Reading the documentation and tutorials	3
Production	4
2.1 Initial Tests	4
2.2 Results	4
2.3 Unforeseen Problems	4
Conclusion	5

Introduction



Todo

Initial Research

1.1 Experiments with real ice cube and light

1.2 Related research from other papers

1.3 So what exactly is Renderman?

1.4 Reading the documentation and tutorials

Superquads [4]

Pixar's Renderman documentation [3] was invaluable for understanding the huge complexity of renderer in enough detail to begin writing useful shaders for it.

Production

2.1 Initial Tests

2.2 Results

2.3 Unforeseen Problems

Conclusion

Bibliography

- [1] <http://dctsystems.co.uk/renderman/angel.html>. <http://dctsystems.co.uk/RenderMan/angel.html>. Accessed: 25th April 2015.

A Renderman compliant renderer developed by Ian Stephenson, I initially chose to use it because it had support for geometry shaders that provided me with a simple way of creating an ice cube shape through the use of superquadrics. Unfortunately, the superquad shader did not work with shadows, the feature set is fairly dated compared to current PRMan releases and opacity support was too noisy (which presented a problem for a project that makes heavy use of translucency), forcing me to move on to using Pixar's Renderman instead.

- [2] Pixar's renderman. <http://renderman.pixar.com/view/renderman>. Accessed: 26th April 2015.

MUST ADD ANNOTATION TO THIS

- [3] Pixar's renderman documentation. <https://renderman.pixar.com/view/documentation>. Accessed: 26th April 2015.

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- [4] The super egg and other super surfaces. http://www.math.harvard.edu/archive/21a_fall_09/exhibits/superegg. Accessed: 25th April 2015.

Although certain superquadrics are similiar in shape to an ice cube, notably the super egg, in the end I instead decided to write a displacement

- [5] Anthony A. Apodaca and Larry Gritz. *Advanced RenderMan: Creating CGI for Motion Picture*. Morgan Kaufmann Publishers Inc., San Francisco, CA, USA, 1st edition, 1999.

Used for : Texture mapping basics, volume shader basics, brownian noise RSL function?

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- [17] Alexey Stomakhin, Craig Schroeder, Lawrence Chai, Joseph Teran, and Andrew Selle. A material point method for snow simulation. *ACM Trans. Graph.*, 32(4):102:1–102:10, July 2013.

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