Voronoi Diagram Based Procedural Shatter Effects

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Outline

- Overview of procedural based shattering method
- Voronoi diagram and multiplicative weighted voronoi diagram
- Particle driven voronoi diagram shatter effects
- Implementation details
- Demos
Problem definition

Shatter

2 a: to break at once into pieces (Merriam-webster)
procedural based shattering method

* Lot's of hack

* Fast, easy to control

* Usually is used as a combination of them
"Isotropic" and "Anisotropic" Voronoi Diagram
"Isotropic" and "Anisotropic" Voronoi Diagram
Particle driven Voronoi Diagram shatter effects
implementation framework

Maya

- FBX SDK write to FBX file
- CGAL based voronoi cell creation
- FBX SDK read scene
Deal with boundary with voronoi cell

case 1: unbounded face
  begin with the first unbounded edge
  subcase 1: unbounded edge didn't intersect with boundary
  subcase 2: unbounded edge intersects with boundary

case 2: bounded face
  subcase 1: all vertex within boundary quad
  subcase 2: have vertex out of boundary quad

Some implementation details
Demo

code host at:
http://code.google.com/p/proceduralshatter/
Thanks for your time!