

Literature Review 3

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Primary Article

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@article {springerlink:10.1007/s00371-010-0507-1,  
author = {Nguyen, Kien and Jang, Hanyoung and Han, JungHyun},  
affiliation = {Korea University, Seoul, Korea},  
title = {Layered occlusion map for soft shadow generation},  
journal = {The Visual Computer},  
publisher = {Springer Berlin / Heidelberg},  
issn = {0178-2789},  
keyword = {Computer Science},  
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year = {2010}  
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Secondary Article

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Literature Review

Author Kein, Jang and Han in the article ,“Delaunay Deformable Mesh for the Weathering and Erosion of 3D Terrain” ,from issue 12 of the Visual Computer in 2010 put forth a method to generate “weathered” effects on surfaces of three dimensional objects. The “weathered” effect is vital in conveying mood and setting. It is contingent on upon in video games and animated films. The authors ,thus, present a uncomplicated and swift process that would be beneficial in the creation the described effect.

The algorithm initializes by inputting a triangle mesh surface of a smooth object ,a cloud of points near the mesh surface. This further is fed to run time analysis for triangulation . From there, the algorithm generates vital information such as normal, mean curvature, and geometric importance of the object. The vector perpendicular to the surface is normal. Mean curvature is the average curve of the surface mesh and geometric importance is how much of the original surface should be retained after weathering. These values are run with varied algorithms. The conclusion of their work resulted in the ability to “efficiently create visually plausible terrain features using algorithms which mimic geomorphological processes.”

“Variational Tetrahedral Meshing,” by the author Han, Kein , results in an algorithm that could generate complex surface meshes with a desirable number of vertices. In addition to this the articles provides a means to generate a mesh surface for volumes that could be modified. The algorithm involves taking in a triangle mesh that defines boundaries for the three dimensional object. It then converts the triangle mesh to a tetrahedral mesh, which has more sides and thus more accuracy. Furthermore, conversion algorithm begins with the vertices of the input surface mesh inserted in a triangulation, to create the control mesh. With the control mesh, the algorithm generates and a cell on the surface is selected. Depending on various anomalies, the algorithm expands from the single cell. The cells are accessed via a priority queue depending on the minimum value of their sizing field. When accessed, the cells are popped off the priority queue and modified so that their sizing field matches the desired amount. The algorithm then applies various complex strategies to refine the mesh.

Comparatively, “Variational Tetrahedral Meshing,” provides a better replicating smooth, fluid moving subjects. This led to introduction of “Delaunay Deformable Mesh for the Weathering and Erosion of 3D Terrain” to introduce a faster approach to generating the weathered mesh surface. The articles, further more, show an increase in computer graphics generation efficiency. Algorithms can generate realistic three dimensional surface meshes that can be used in various fields of computer graphics .In other words the smaller the gradation value the smoother the surfaces mesh will be since the tetrahedral will be sized smaller. The articles mark a transition from artists to algorithms generating realistic terrain.