



THESIS ASSIGNMENT

Name and Surname: Bc. Michal Piovarči
Study programme: Applied Computer Science (Single degree study, master II. deg., full time form)
Field of Study: 9.2.9. Applied Informatics
Type of Thesis: Diploma Thesis
Language of Thesis: English
Secondary language: Slovak

Title: Base Manifold Meshes from Skeletons

Aim:

- 1) study of relevant literature
- 2) proposal of suitable algorithm
- 3) implementation of an algorithm that generates mesh approximating volume of input skeleton
- 4) extending the algorithm to work on linear and cyclic skeletons
- 5) extending the algorithm to skeletons with ellipsoid nodes
- 6) using tessellation shaders for subdivision of generated base mesh
- 7) testing of proposed algorithm
- 8) writing the thesis

Literature: Alliez et al. 2010 - B-Mesh: A Fast Modeling System for Base Meshes of 3D Articulated Shapes
Bearentzen et al. 2012 - Converting Skeletal Structures to Quad-Dominant Meshes

Annotation: Skeletal structures are used in computer graphics to represent basic topology of a model. We could apply a reverse process to skeleton extraction and recover the base mesh represented by a skeleton. Such base meshes, generated directly from skeletal structures, could be used to ease the modelling of base models of articulated characters. Alternatively this technique can be used to procedurally generate articulated models. The first part of this thesis is to explore current state of the art algorithms. Next, we will implement the most suitable algorithm. Finally, we will extend the algorithm in order to remove as many drawbacks of the original technique as possible. Also we will use tessellation shaders to accelerate the subdivision of generated base mesh.

Keywords: skeleton, convert, base mesh, 2-manifold

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