Advanced Computer Graphics
Friday 27th November, 2020

Assignment 2 (Loop subdivision++)

In this lab session we will take a look at Loop's subdivision scheme. Download the skeleton code from Nestor (*Lab Sessions*), unzip/extract the files and open `LoopSdv.pro` in QtCreator. The provided skeleton code already implements Loop's subdivision scheme for triangle meshes.

Main assignment

Extend the implementation of Loop subdivision with boundary rules. This entails the support for subdivision of meshes containing one or more boundaries and implementing the special boundary rules to compute the positions of the new vertices of the subdivided boundary such that it is smooth. Before starting on this part, make sure you're familiar with the HalfEdge data structure (see this week's practical slides). A special mesh `models/OpenCube.obj` is included for you to easily test your code on.

In addition, implement reflection lines or isophotes. Add some widgets to the GUI to e.g. control the frequency of white/black stripes (or two other colours of your choice). The user should be able to switch between smooth shading and reflection times through the GUI.

Additional feature

Implement vertex selection. Some hints are available in this week's practical slides (but there are various methods of implementing it).

Bonus

In addition to reflection lines or isophotes, implement a visualisation of Gaussian curvature (e.g. colour-based). An alternative bonus is to implement edge selection.

Deadline

See Nestor (*Time Schedule*). Details on how to submit your work can also be found on Nestor (*Lab Sessions*).

Assessment

See Nestor (*Assessment* → `CodeForm.pdf`).