Final Project

In your project you will implement a 3D snake game based on the previous assignments.

Requirements (65%):

• **Snake** constructed from scaled snake3.obj (or snake2.obj if snake3 is too heavy) and 16 joints (16 links). You may add head or tail and more joints.

• **Cameras**: The user can switch between two points of view:

   1. From top view. Static camera as we are used to.

   2. From the snake head point of view (first person). See Demo SceneWithCamera.cpp.

• **Menu** at the beginning of game and between levels (show the score after each level).

• Prices: Moving object that when is reached gives extra points or special abilities to the snake. Each object has different initial velocity (vector in 3D).

• **Skinning** (use libigl tutorial): Implement Dual Quaternion Skinning, Linear Blend Skinning will give you less score. You will have to calculate weights for each vertex. Weights for the skinning sum to 1 for each vertex. Each point on the snake will be influenced at list from the 2 closest joints. Use may use the function of tutorial 404 of Libigl. See project section files for more information.

• You must use **Collision detection** to detect whether the snake touch an object. You may choose to use multiple cylinder covering the snake for this purpose (the cylinders will not be visible)

- After certain amount of time past or certain number of objects were collected announce about end of level (you may use command line). Ask the user if he wants to play again of continue to the next level.

- **Scoring mechanism** (you may use command line to show the score)

- **Basic locomotion, choose one of the following:**

  - The Snake must move in space (do not use IK)

  - Use first loop of the FABRIK algorithm to move the snake in space.

  - Use bezier or other spline type to calculate the joints location while moving

- **Readme file -** Describe what you did and your difficulties

Additional Points (Up to 35%)

Choose couple of topics from the following list (grade will be given according to the difficulty of the task you implemented and the quality of the result):

- Special snaky locomotion

- Fog

- Texture (see tutorials 301 and 501-3 to find the best texture coordinates)

- Moving the objects or the snake according to Bezier curve (show the curve using layout edges)

- Sound

- Splitting objects (use libigl tutorial)

- Interactive User Interface using ImGui (including show the score on the screen during the level)

- Gravity and bouncing objects.

- Preventing self-collision of the snake

- Your ideas

Submission in pairs to Moodle. As in the last submissions add readme file (of what you did and difficulties and link to your git repository.

Submission date 22/02/23