CS312:Fall 2016

Assignment 4: 3D Flocking in Shaders

Due Thursday Oct 20, in groups of 1 or 2.

Overview: Convert your hw3 (boids) to shader-based OpenGL. All requirements remain the same as before. What didn't work in hw3, if any, should be fixed by now. I highly recommend that you complete the steps specified in Lab 4 before starting this conversion.

Program Requirements:

- All requirements of hw3.
- Implement your own vector/matrix library supporting the following minimal functionalities. You are welcome to add more, of course. For this assignment, you are not allowed to use glm or any other matrix libraries. I want you to implement from scratch once. This brings much deeper understandings of how the matrices work, as well as allowing for easier debugging since every line of code is yours. Note that legacy OpenGL required a matrix stack for both ModelView and Projection matrices. You are not required to implement either. It's your choice.
 - 1. Basic vector/matrix operations
 - vec2, vec3, vec4, mat2, mat3, mat4
 - zero, identity, addition, multiplication
 - dot product, cross product
 - transpose, inverse, trace, determinant
 - 2. Transformations
 - translate
 - rotate
 - scale
 - 3. View and Projection
 - gluLookat
 - gluPerspective/glFrustum
- Please create and submit a short video capture to demo your boids. The video length should not exceed 5 minutes, but can be much shorter if you wish. Try to show off all features of your boids the best you can, along with any extra credit features if you successfully implemented them.