CS271 Spring 2021 Computer Graphics II

HomeWork 1

Name:

Student ID:

E-mail:

Acknowledgements:

- Deadline: **2020-03-18 18:00:00**
- You can choose C++ or Python, and no restrictions on programming framework. You can freely use frameworks such as openGL.
- The full score of this HW1 is 100 points, and there is a bonus of 10 points.
- The **report** submits as a PDF file, the **programming part** should package all the files include **code**, **input files**, **executable file**, **readme.txt**, and **report**. The package name is your_student_name+student_id.zip.
- You will get Zero if the code not passing the plagiarism check.

Problem 1: 3D convex hull algorithm(55+10 points)

- Implement a 3D convex hull algorithm (not limited to the ones in slides) with visualization.
  You should describe the convex hull algorithm you choose and state the data structure you use to store the convex hull.
  Then prepare some input samples for fast display or you can design interactive input functions, and show some visualization examples, better with obvious differences.(55 points)
- Analyze the time complexity and show the runtime with incremental number of points.(10 points)

Problem 2: Collision Detection for two convex hulls (25+10+10 points)

- Inheritance the **problem 1** algorithm you implement, further implement collision detection for two convex hulls of two 3D point sets, and Show some visualization examples in your report, better with obvious differences. (25 points)
- Analyze the time complexity and show the runtime with incremental number of points.(10 points)
- **(Bonus problem)** State how you accelerate your algorithm if have.(10 points)