Simplified Minecraft

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Libraries

irrKlang, FreeImage, freeglut, glew

Approach

Total points : **240**

1. Physics based motion (**20 pts**)
   We have gravity in this game.

2. Other animation and motion events can be triggered by user input (**15 pts**)
   Players could use left mouse button to dig and right mouse button to put cubes. The animation of hand is displayed.

3. Other procedural animation in vertex shader (**10pts**)
   The animation of hand is calculated in vertex shader.

4. Texture mapping: 5 or more different textures on objects in your scene (**15 pts**)
   We have different textures to the cube to create different components such as terrain, wood, leaf, brick and water.

5. Alpha blending (**10pts**)
   The water is translucent, we use alpha blend and sort the faces from near to far.

6. Procedural texture computed in shader (**10 pts**)
   For the water, we apply simple dynamic texture such as moving uv-coordinate.

7. Planar reflections or shadows (**15 pts**)
   We will apply real-time shadow to the scene, which is an improvement of the original game.

8. Skycube (**10 pts**)
   We apply skybox that will change from daytime to night by using texture mix.

9. Background music + 5 or more sound effects (**15 pts**)
   We use background music and sound effects such as water flowing, bird singing, digging, putting cubes.

10. Camera can be controlled by user input (**15 pts**)
    We use a first-person view in which player use WASD keys to move and use mouse to control the view.

11. Many lights: 10 or more light sources (point lights and spot lights) (**25 pts**)
    We add environment light, directional sun light and 10 spot torchlights in the game.

12. Many shaders (**20 pts**)
    We have 5 different shaders to render the cube, the bedrock, the skybox, the shadowMap and the UI.

13. Collision Detection and Reaction(**30 pts**)

14. Frame buffer object (**30 pts**)
    We use FBO when rendering shadowMap to store it into an off-screen texture.

Related work Cite previous literature

Original Minecraft

Team member roles

Yucong Pan: player motion, camera control, collision detection, game logics and etc. Will also help with the rendering. Because Yucong is familiar with game development, and have written many scripts about character controlling or collision detection.

Yuanpei Zhao: model loading, skybox, texturing, lights, shadows, occlusion query and music and other rendering issues. Because Yuanpei is learning CS535 now and have learnt some rendering skills.

Schedule

Week	date	Todo (Yucong / Yuanpei)
1	10.28 – 11.03	Basic game logic and storyboard / Load basic cubes and textures
2	11.04 – 11.10	Player control and collision detection / Procedural texture and skybox
3	11.11 – 11.17	Basic UI / Lights and shadows
4	11.18 – 11.24	Animation and motion / Occlusion query and music
5	11.25 – 12.01	Debug

On Nov 19 we can demonstrate this project in which players could walk/jump and look around, scene will contain terrain, trees, rocks, water, skybox in a small scale of space. Players could also dig the cubes and create new stuff using crafting table.