

Prerequisite:

Your system should have glut and glew libraries to properly run the codes.

On Linux using command line:

sudo apt-get install freeglut3-dev

sudo apt-get install libglew-dev

CmakeLists.txt command are same as Homework:

mkdir build

cd build/

cmake ..

make

Overall implementation:

Basically we need to simulate the cloth using a mass-spring-damper system with euler methods. To make the cloth falling down or interacting with the other objects more realistic, the aerospace force interacting with cloths should be included. And I tried to find the resources about collision when cloth self collides or collides with balls or floors, but the time is limited and paper about cloth simulation is not very vivid.

main(): we can choose different commands to run our project like -m to select masses and -s to select steps_per_frames.

CGL library has limited documentation online and I do not know how to render in 3D world space, so I give up Viewer but implement glut animation and set up the model-view-projection.

application.h:

Set up the environment and constants like stiffness coefficient and damping coefficient, step_per_frame, gravity etc. Applications mainly do the job to render.

Cloth.h:

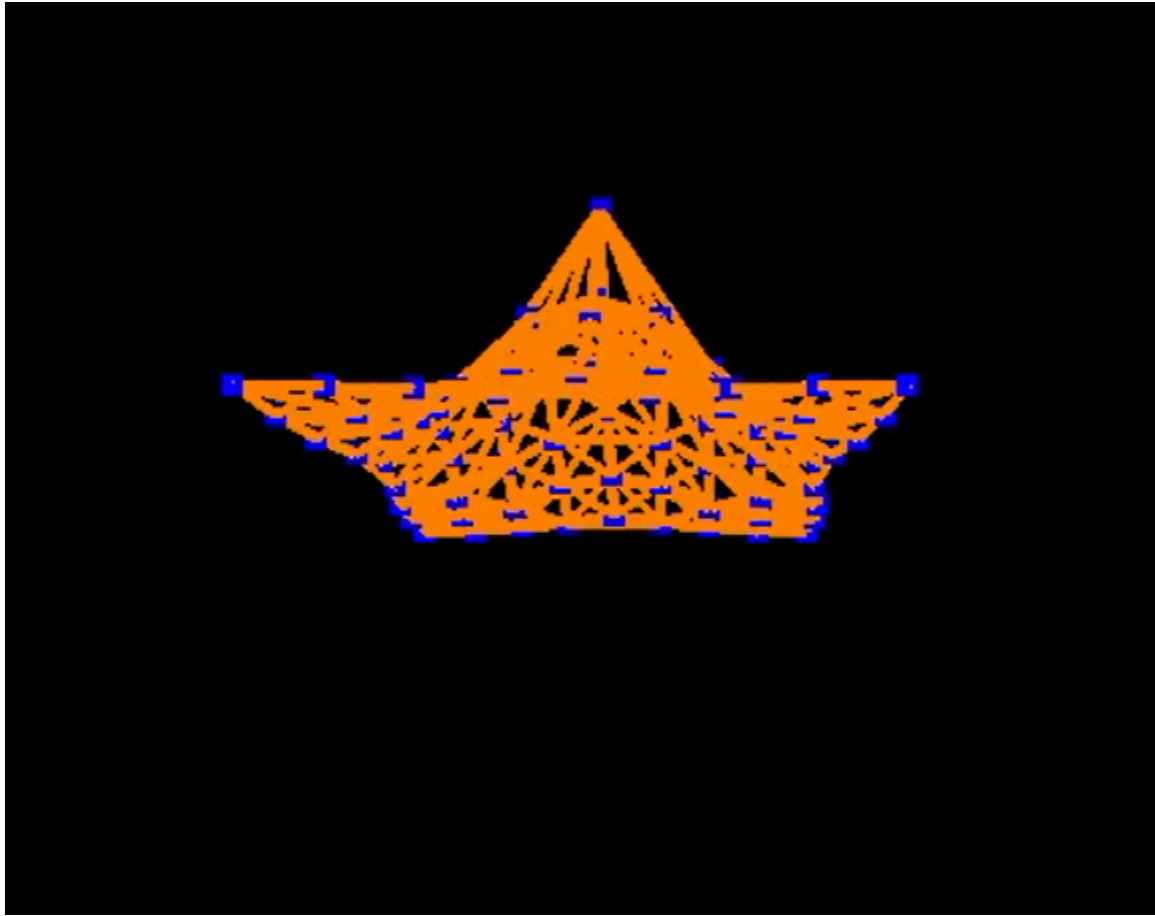
The object cloth will initialize particle mass objects in 2D arrays and structural, shear and bending springs to connect these masses. Then we call a function simulateEuler() to simulate euler methods and airforce resistance.

mass.h:

containing variables mass, velocity, position and force.

spring.h:

containing rest_length and two mass objects.



Citation:

template code

https://www3.ntu.edu.sg/home/ehchua/programming/opengl/CG_Examples.html

project layout:

<https://github.com/sam007961/FastMassSpring>

methods:

http://www.cs.cmu.edu/afs/cs/academic/class/15462-s13/www/lec_slides/Cloth_Simulation_and_Manipulation.pdf

https://cseweb.ucsd.edu/classes/wi18/cse169-a/slides/CSE169_11.pdf

<https://www.ics.uci.edu/~shz/courses/cs114/docs/proj3/index.html>

