CS520 Assignment 3: Inverse Kinematics with Skinning

Coding Environment: macOS Catalina

<Describe what I have implemented>

1. Implemented skinning successfully. (skinning.cpp)
2. Implemented forward kinematics successfully. (FK.cpp)
3. Implemented inverse kinematics successfully. (IK.cpp)
4. One video, combined screen recording to demonstrate result
5. Screenshots. Due to using screen recording to make the video (one of the three ways which are provided by instructor), I picked a few screenshots in the folder pic.

<Extra>

1. Implemented pseudo-inverse IK method. (IK.cpp)  
   Using variable IKmethod to choose IK method. (Line 18)  
   IKmethod = 0 -- Damped Least Squares  
   IKmethod = 1 -- Pseudo-Inverse
2. Added interesting elements to make the video interesting, such as clipping several hand gestures videos, adding background music, and so on. Having fun and enjoying yourself.

< Damped Least Squares VS. Pseudo-inverse>

Damped Least Squares uses two constrains to avoid singular matrix issue, so it was much more stable than Pseudo-inverse method. When I tested in Pseudo-inverse method and dragging the IK handle for a long distance within a short time, the avatar would shake and twisted. The computation complexity is the advantage for pseudo-inverse method.