Nanyang Technological University

Assignment 2 Report Novel Interface for 3D Mesh Viewer

DM6121 Human Computer Interface

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1. **Device**

   I choose to use Leap Motion to interact with 3D mesh viewer.

   Leap motion controller supports hand and finger motions as input, analogous to a mouse, but requiring no hand contact or touching. The LEDs generate a 3D pattern of dots of IR light and the cameras captures almost 300 frames per second of reflected data. Then the host computer analyzes the captured images to synthesize 3D position data.

2. **Interaction Style**

   Right hand to control translation and left hand control rotation. Parallel movement in each direction correspond to x, y and z axis.

   Two hands together to zoom in and out.

3. **Why do you design the interface in this way?**

   Since users can use movement of hand to feel like they control the mesh in the real world. Translation is basic and most people are right-handed. So I choose to use right hand for translating. In real life, when people want to see some thing more clearly, they will choose to use both hands to get the thing closer. As a result, two hand swift in opposite direction is for zooming in and out in this interface.

4. **What are the advantages of your proposed interaction style compared with the traditional mouse-based interaction?**

   (1) It is easy to understand and control.
   (2) Faster operation speed.
   (3) More suitable for 3 dimensional control than traditional mouse which can only move in 2 dimensional surface.
   (4) Increase interaction between computer and human in real world.

5. **Are there any limitations/drawbacks of your chose device and your developed interface? Any way to improve it?**

   (1) Sensor may not detect hands and gestures precisely and sometimes makes mistakes.
   (2) Sensor can only detect hands in comparatively small space. Any movement outside the detection space range may make controller to lose focus.
   (3) Hand may get tired fast.

   Improvement:

   (1) Since sensor may not detect two hands together as precisely as detecting one hand, interaction style can be changed to use only one hand for control.
   (2) Hardware can be improved to increase accuracy so that even micro translation can be implemented precisely.