

H3D Instructions

AAUW Tech Savvy

The following examples are included on the “asl-3” lab computer, Colin Lea’s computer, and the ARMLab laptop. You can contact Colin by email at colincls@gmail.com.

The following procedure is for running H3D demos using the Novint Falcon or Phantom Omni.

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To Run

Run the “**H3D Load Settings**” Program from H3D API in the start menu (or located on the desktop).

Apply the following settings:

Falcon:

- Haptics Device-> Falcon Device
- Default Stylus -> Sphere

Omni:

- Haptics Device -> Any PHANToM Device
- Default Stylus -> Sphere

Movements

Using the mouse or keyboard arrow keys you can move/rotate the system.

Press F to enter **Fly Mode**. Using the arrow keys will translate you in space.

Press E to enter **Examine Mode**. Using the arrow keys changes the angle of the camera.

Demo Suggestion

I suggest running #10 (Block Game), #A1 (Tower), #1 (Planar Constraint cube), #2 (Axial Constraint: Pipe), and/or #8 (Maze).

Problem/Solutions

1) Problem: The stylus becomes really small or really big.

Solution: Re-initialize (restart H3D)

2) Problem: There is a red light on the Falcon.

Solution: Pull the end effector out and then push it in to recalibrate the device.

Examples

Demos are located in the folder *C:\H3D\hapticdemos* or *C:\H3D\CLEA* on all computers. To run a demo access it through the H3D Viewer in the start menu.

1)/Constrain/ Constrained plane – Cube.x3d

Holding down the main mouse button restricts movement about a vertical plane. The same idea could be used for making an incision for surgery.

- Have the student trace about the y-axis (moving forward/backward and up/down).
- Tell the student to hold down the main button on the end effector.

2)/Constrain/ Constrained plane – Sphere.x3d

Same as the cube example.

Holding down the main mouse button restricts movement about a vertical plane. The same idea could be used for making an incision for surgery.

- Have the student trace about the y-axis (moving forward/backward and up/down).
- Tell the student to hold down the main button on the end effector.

3)/Constrain/ Pipe.x3d

Holding down the main mouse button restricts movement about an axis plane.

- Have the student move the end effector into the pipe.
- Ask them to move through the pipe without hitting the sides
- Tell the student to hold down the main button on the end effector. It should steer them through the pipe without contacting the edges

4)/Deform/Deformable Cube.x3d

Note: Does not work on lab (asl-3) computer! (Compiling issues?)

A deformable cube is shown on the screen. The user can move the end effector to manipulate the geometry.

5)/DICOM/foot-DICOM.x3d

Note: SLOW on lab computer.

Uses medical data to visualize part of a human foot. The haptic **renderer must be changed** to the Ruspini renderer for effective performance. In the H3DViewer select *Rendering>Select Render Mode>Ruspini*.

6)/Body Geometry.x3d

This includes a 3D model of a human body. The body is haptically augmented but there are no additional effects.

7)/Injection/Injection.x3d

Uses the same 3D body as #6 but adds an axial constraint. For greatest effectiveness go to “H3D Load Settings” and change the Device Stylus to “Syringe” if available. The user is guided to inject at the upper end of the arm.

8)/Map/maze.x3d

The user can navigate a two-dimensional maze with 3D+haptic walls. Pull the device all the way out to exit the maze (in case students get stuck)

9)/Map/TwoDimensional.x3d

Using the mouse the user can add spheres to the screen. This design can then be felt by the user.

10)/CLEA/ClockGame/BlockGame.x3d

Traverse back and forth between the sides while avoiding the center blocks. Press the main button to constrain the user’s hand movement to stay between the barriers.

Additional:

A1)C:/H3D/H3DAPI/examples/RigidBodyPhysics/tower.x3d

Many examples are included with H3D. One particularly good one uses a block tower with rigid body

physics. The user can toss the blocks around using physical control. Reset with “r” on the keyboard.

Installation

To install on your own computer you need two things - H3D and haptic device drivers. Both can easily be installed on Windows. H3D can be downloaded at:

H3DAPI Windows Installer

<http://www.h3dapi.org/modules/PDdownloads/viewcat.php?cid=14>

To use the Falcon you must install addition drivers from the Novint website located below:

Novint Falcon Drivers (click the top link - (“Novint Falcon Drivers (V.4.0.xx.xx)”):

<http://home.novint.com/support/download.php>

Omni drivers can be downloaded on the Sensable website. You must fill out a form before getting access to the drivers:

Sensable Phantom (PDD) drivers:

<http://www.sensable.com/support-download-pdd.htm>

To get additional example programs you should copy the folder “C:/H3D/CLEA/” from the ARMLab laptop, or email Colin for the files.