Summary of the QTVR Manual
(See http://www.letmedoit.com/qtvr/qtvr_online/course_index.html for more instructions.)

QuickTime VR Authoring Studio quickly creates panoramas and scenes that can be played back over the Internet if the browser has a QuickTime plug-in; 5 authoring tools:
1). **Panorama Stitcher** – stitches a series of images into a single QTVR panorama
2). **Panorama Maker** – converts single panoramic image into a QTVR panorama
3). **Object Maker** – creates QTVR objects
4). **Scene Maker** – creates virtual reality scenes allowing the user to move through the scene, selecting destinations or manipulating objects (links the panoramas and objects together by creating a map and hot spots)
5). **Project Manager** – to manage complex projects and automate processing tasks

Three QTVR media types:
1). Panoramas – Allows the viewer to see a scene from a variety of angles. A full panorama can be panned horizontally 360 degrees, creating the illusion of standing in the middle of a room and turning around in the middle.
2). Objects – Allows viewer to see a 3-dimensional object from a variety of angles. The object can be rotated around or zoomed in on to see details.
3). Scenes – A collection of panoramas, objects, and other media. Each media element is called a "node." Each "hot spot" indicates an area linked to other media.

Creating Source Material:
-digital camera (or film camera, but converted to digital images; if use zoom lens, make sure same zoom percentage used on every image of that panorama)
-tripod for camera with special notches so that a photo can be taken every 20 degrees (18 total images to stitch together) or 30 degrees (12 total images to stitch together) – camera should be mounted with vertical orientation
-images from video camera
-images created with a rendering program

See a model of the Studio Interface – page 10

PANORAMA STITCHER
1). When creating new file, select **Panorama Stitcher**.
2). When a dialog box appears, type a name for the document and click **Save**.
3). The Panorama Stitcher window will appear.
4). Open the **Lens** pop-up menu and choose the lens you used to photograph your images (probably 35mm, but check camera to be sure).
5). Click **Add Image** and select images to use (any format supported by QT) or drag folder to Stitcher window. Images appear in alphanumeric order (so name them accordingly).
6). If adjacent images do not match in terms of lightness and darkness, open individual

photos in **Photoshop** and adjust using **Levels** (Image -> Adjust -> Levels or Command L).

7). Click checkbox **Images Wrapped** if images give a 360 degree view.

8). Click **Image Alignment**. In **Horizontal Alignment** section, enter number of degrees between each image (using this and lens type, calculates overlap). If images not captured on level plane, estimate vertical offset in **Vertical Alignment** section. Close **Image Alignment**. (Can use **Pair Alignment** to do side-by-side image alignment if necessary).

9). Click a Sort button to change image order (alphanumeric or reverse) or drag image so that images appear in correct order to be stitched together.

10). Rename PICT file if desired. Click the checkbox to make sure it saves. PICT file is an intermediate step in panorama creation where images stitched into one file.

11). Rename the tile movie if desired. Click the checkbox to make sure it saves. The tile movie is an intermediate step in panorama creation involving image compression.
   -Reasons to save the tile movie separately:
      -Save Time – If remake panorama later, no need to repeat compression
      -Play the Panorama from Hard Disk – If panorama movie not flattened, must save the tile movie to view the panorama

12). Rename panorama if desired (space next to Pano button). Click checkbox to make sure it saves.

13). Click **Settings** to open **Stitch Settings** window. Under Image Processing and Image Size tabs (leave defaults usually):
   -**Bend** – Softens sharp edges within image and where images overlap.
   -**Fill** – Fills edge of image not covered by source image pixels with non-black color
   -**Deskew** – Compensates for slight rotation in images occurring at image capture.
   -**Sharpen** – Sharpens blurry images by increasing contrast of adjacent pixels.
   -**Stretch** – Stretches source images as needed to more accurately aligned.
   -**Crop** – Removes stray edge pixels to give clean edge and hide image boundaries.
   -**Auto Size** – Allows stitched image size to be determined by source images' sizes.

14). Click the **Compression** tab in **Settings** window (see table on page 96).

15). Click the **Playback** tab in the **Settings** window:
   -**Panorama Viewing Size** – Enter width & height (pixels) of playback window
   -**Default Pan** – If want panorama to open with a pan angle besides zero, type it in. The pan angle is the horizontal distance (in degrees) from the "starting point" of the panorama.
   -**Pan Range** – Enter scope of panorama (i.e. if covers 360 degrees, put 0 for Start and 360 for End).
   -**Default Tilt** – If want panorama to open with a tilt angle besides zero, type it in. The pan angle is distance (in degrees) above or below panorama's horizon.
   -**Tilt Range** – Click Auto for the Maker to calculate automatically or type in the angles for the top and bottom of the panorama.
   -**Default Zoom** – If want panorama to open with zoomed-in view, type percentage
   -**Zoom Range** – Enter minimum and maximum zoom angle for panorama

16). Click the **Imaging** tab in the **Settings** window:
   -Static quality should be High; Full correction
   -Motion quality should be Normal (so quickly responsive to user); Full correction
17). Click the **File** tab in the **Settings** window:
   -**Flattening** – Must be flat to play without tile movie. Select Flatten to Data Fork.
18). Click **OK** to close the **Settings** window.
19). Click **Stitch Pano** button. Wait a few minutes. When done, playback window opens.
20). Adjust the playback settings if desired. Click **Set Playback Settings** to remake panorama with new settings. **DONE.**

PANORAMA MAKER
1). When creating a new file, select **Panorama Maker**.
2). When a dialog box appears, type a name for the document and click **Save**.
3). The Panorama Maker window will appear.
4). Click **Add Image** button and select the images to use (any format supported by QT).
5). Check that image has landscape, not portrait orientation (use rotate buttons to fix).
6). Rename the tile movie if desired. Click the checkbox to make sure it saves.
7). Rename panorama if desired. Click checkbox to make sure it saves.
8). Click **Settings** button. Have Tiles set on **Auto** (will calculate optimal # of tiles to divide panorama into). For compression, see table page 96 again. Click **OK** to close Compression Settings window.
9). Click the **Playback** tab in the **Settings** window (same as Panorama Stitcher).
10). Click the **Imaging** tab in the **Settings** window (same as Panorama Stitcher).
11). Click the **File** tab in the **Settings** window (same as Panorama Stitcher).
12). Click **OK** to close the **Settings** window.
13). Click **Make Pano** button. Wait a few minutes. When done, playback window opens.
14). Adjust the playback settings if desired. Click **Set Playback Settings** to remake panorama with new settings. **DONE**.

SCENE MAKER
1). When creating new file, select **Scene Maker**.
2). When a dialog box appears, type a name for the document and click **Save**.
3). The Scene Maker window will appear.
4). Click **Add Map** button. (A map is backdrop to help layout nodes and links in the scene - optional.) Select a map file for scene and it appears in Scene Maker window.
5). Rename Hot Spots if desired. Click the checkbox to make sure it saves. Hot Spots are locations in the scene to interact with and they are saved to this file.
6). Rename Scene file if desired. Click the checkbox to make sure it saves.
7). Create scene components by adding nodes into a scene:
   a). Creating a panorama within Scene Maker:
      1. Click **Panorama Stitcher** button and the cursor changes to a circle.

2. Move circle to map and click. Icon representing panorama node appears. Type name for node (name after panorama going to include).
3. Place pointer over node, then press and hold mouse button until pop-up menu appears:
    -**Edit Hot Spots** – Opens Hot Spot Editor window (to create links between panoramas)
    -**Open** – Opens tool for node (Panorama Stitcher here)
    -**Make** – Processes node (would stitch panorama here)
    Choose **Open**.
4. Create the panorama and close the Panorama Stitcher afterwards

b). Adding previously created QTVR media:
1. Drag panorama file into Scene Maker window so node appears.
2. Drag object file into window so node appears

c). Creating links:
1. Click **Set Dual Links** (two arrows going opposite directions) button. Dual links allow user to move back and forth between nodes. One way links only allow forward movement.
2. Place pointer over node. Press and hold mouse button, dragging the pointer to another node. A dual link appears between the nodes.

d). Defining hot spots and setting destinations:
1. Place the pointer over one of linked nodes in scene, then press and hold mouse button until pop-up menu appears. Choose **Edit Hot Spots**.
2. Two windows open—the Hot Spot Editor and image of node linking from. Click a destination to link to by clicking one of nodes listed in Hot Spots Editor window.
3. Define hot spot in the node you're linking from by clicking one of buttons labeled with a geometric shape. Then press mouse button and drag over area in panorama window that want to define as hot spot. Each hot spot that goes to a different panorama will be a different color. There can be multiple hot spots linking to the same panorama.
4. Click **Set Destination** in Hot Spot Editor window.
5. Window with destination node image appears. Move around image until desired view shows, then click **Set Destination**.
6. Close windows until dialog box appears. Click **Save**. Hot Spot Editor window closes automatically.
7. Place pointer over node just set as destination and set the link up in the opposite direction to make it dual.

8). Click **Settings** button. Adjust settings like in Panorama Maker and Stitcher Settings.
9). Define start node for scene. Click node in Scene Maker window that will be users' start point. Choose **Set Start Node** from Scene menu.
10). Click **Make Scene** button. Wait a few minutes. When done, playback window opens.
11). Adjust playback settings if desired. Click **Set Playback Settings** to remake panorama with new settings. Check links. **DONE**.
12). Open up your scene and test it--go to all of the locations and make sure that the user does not get stuck in one part of the movie (no "dead ends"). There is a button with

an arrow with a question mark inside of it. If you click on this, all of the hot spots become visible, making navigation easier for testing.

Creating Links to Blobs and URLs:
Blob – term for link to anything besides panoramas or objects created in QTVR
     -i.e Can import Scene with a blob link into Director; inside Director, define action to take when user clicks blob link
1). Click the Blob or URL button in Scene Maker window.
2). Create one-way link from panorama to blob or URL.
3). Place pointer over node linked to blob/URL. Press and hold mouse button until pop-up menu appears.
4). Choose Edit Hot Spots. Follow steps from above for defining hot spot.
5). If creating link to blob, write down its ID number. ID number appears in HS Editor window (corresponds to hot spot color). Need later.