Deep Exploration 5.0 Tutorial
Creating a Customized 'views.xml' File

Welcome to the world of 3D with Right Hemisphere!

The aim of this tutorial is to learn how to use Deep Exploration to:

- Matching custom views.
- Extracting rotation values.

Assumptions

Certain assumptions have been made regarding this tutorial:

- You should be familiar with 3D concepts.
- You should be familiar in the use of Deep Exploration.
- You should be familiar with your existing CAD application.
- Note that the display of the model on your computer during this tutorial may be different depending on the graphics card installed on your computer, the screen geometry, and the colors and placement of objects that you choose.

Features Covered

- Understanding the Views menu.
- Matching custom views.

Requirements

The following software and files are required for this tutorial are:

- Deep Exploration CAD Edition version 5.0.x.
- A 3D file accessible to your computer.
- A 2D file displaying the required image of the model accessible to your computer.

Completion Time

This tutorial should take approximately 30 minutes to complete. Note that it may take longer depending on how easy it is for you to match the 3D model with the 2D image.

Before You Begin

- Ensure you have a 3D file and the 2D image of that file accessible to your computer.

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Understanding the Views Menu

Many of the views that are displayed in the right-click Views menu are controlled by the views.xml file that is delivered with Deep Exploration CAD Edition. The file's structure defines the views and folders that are visible within the View menu. That is, the file is used to display a set of nested folders containing views from which you can select to display the models.

The views.xml file is located in Deep Exploration's installation folder. For example, C:\Program Files\Right Hemisphere\Deep Exploration 5\views.xml.

The following example shows the code of the default views.xml file:

```
<?xml version="1.0" encoding="UTF-8" ?>
<!--Deep Exploration 5.0 Views -->
<Views>

<View name="views example">
      <View name="LTF 1" X="46.1"    Y="23.9"     Z="0"      perspective="0" />
      <View name="RTF 2" X="46.1"    Y="-157.1"   Z="180"    perspective="0" />
      <View name="nested">
            <View name="LTF 3" X="46.1"    Y="22.9"     Z="0"      perspective="1" />
      </View>
</View>

</Views>
```

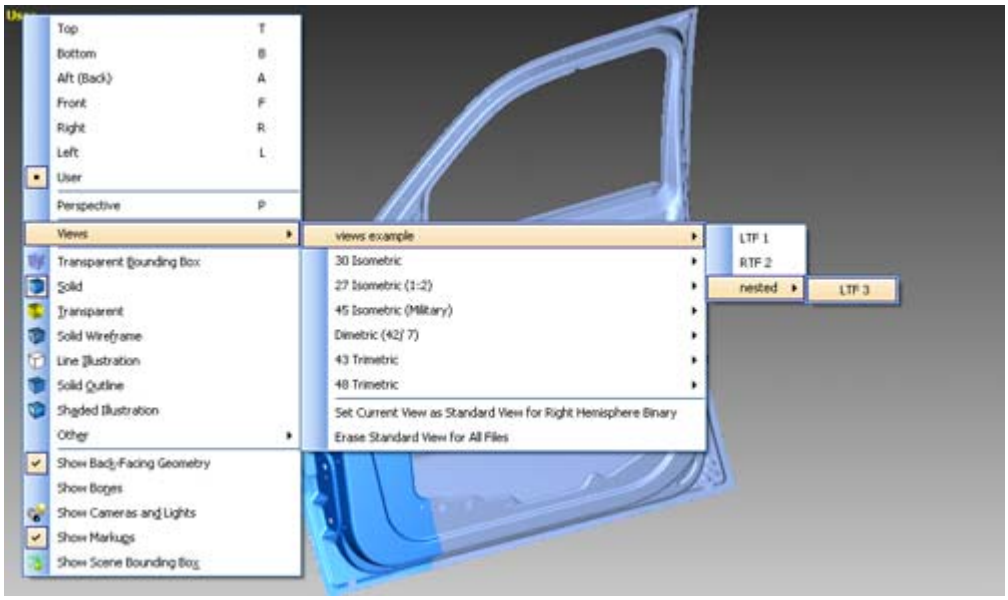
The file's structure is as follows:

1. View name.
2. X, Y, and Z rotation values.
3. Perspective view value (Boolean).

Note: If the perspective value is set to 1, the scene is displayed in perspective. If perspective is set to 0, the scene is displayed in an orthographic view.

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The following example shows the views that are displayed in Deep Exploration with the default views.xml file:



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Matching Custom Views

If you have a set of existing rotation values for your standard views, it is quite likely that they are not in a form that Deep Exploration can use. This is due to the multitude of rotation orders and axis coordinate systems that are in general use in various industries.

This procedure takes an image made from a specific model in your existing CAD system and lines it up with the same model in Deep Exploration.

Procedure: Matching Custom Views

1 Choose a model to use in both your existing CAD system and Deep Exploration, with which to perform the alignment.

Tip: To make matching easier, use a model that is thin along one axis and has well defined corners. Here, we have chosen the door of a car. It has well defined corners and, although it is not flat, it is sufficient.

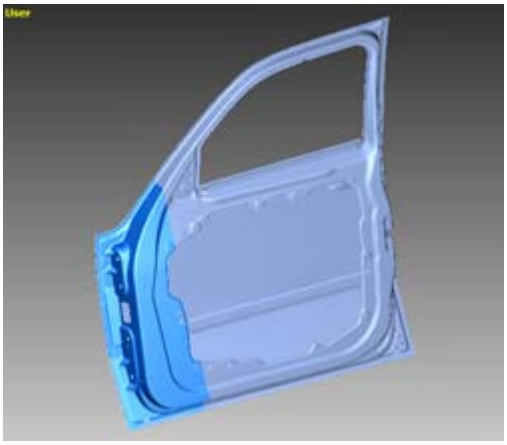
4 Open the model on your existing CAD system, and set the camera to the view that you want to duplicate, ensuring that it is an orthographic view.

Note: Perspective views can also be duplicated but are slightly more difficult to match.

5 Save an image of the model that is slightly smaller than the Deep Exploration viewport, and ensure that the model is centered in the image. For example, you could take a screen shot of the view.

Note: If using a perspective view, the model must be centered in the screen (aimed at the CAD system camera). The image must also be exactly the same size as the Deep Exploration viewport.

6 Open the model in Deep Exploration.



7 Right-click over the viewport and click **Open Background**.

8 Navigate to and select the image you want, and then click **Open**.

9 Right-click over the viewport and choose **Background Image > Center** to center the image in the viewport.

Note: All scaling is removed from the image when you center the image.

10 Resize the viewport so that it is the same size, or larger than the image. This ensures you can see edges of the image.

Note: It is important to use the perspective view if the image to which you are matching is also in perspective.

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11 Move you cursor over the viewport label until a ‘text’ icon is displayed.

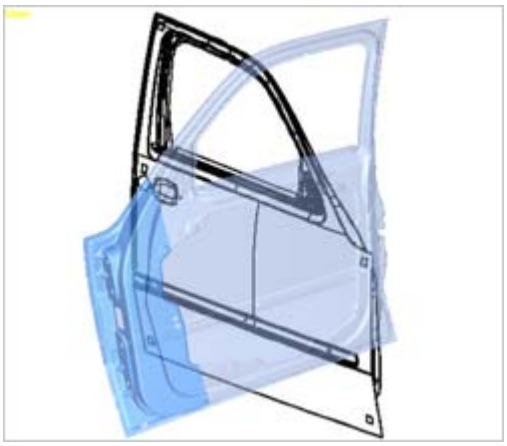


12 Right-click the viewport label and click **Transparent** so we can see the image through the model. This aids us in aligning the model with the image.

13 Ensure perspective is turned ‘off’ (no tick next to the ‘Perspective’ command) by doing one of the following:

- Right-click the viewport label and click **Perspective**.
- Press P on your keyboard.

Note: You may have to resize the model again to match the image.



We now rotate the model to align with the image.

14 Pan and zoom the model until it is centered on and is the same size as the image.

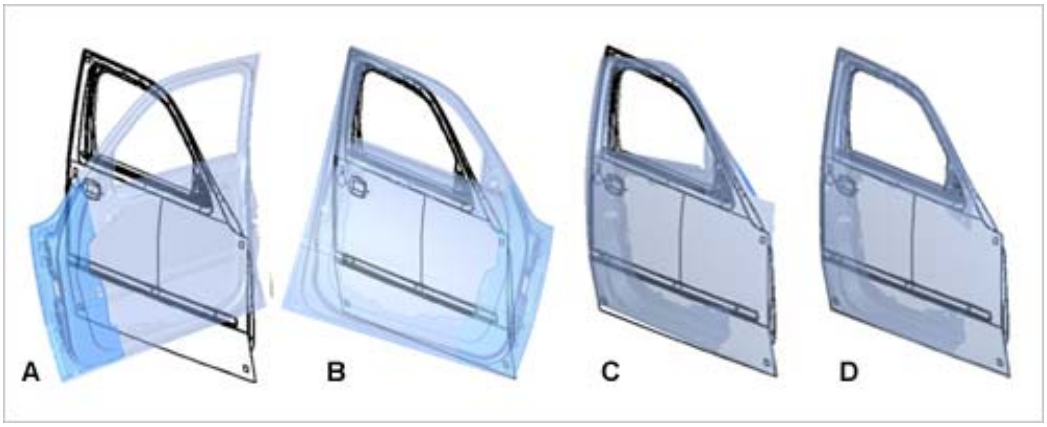
Tip: Use the 3D Navigation shortcut keys to pan, zoom, and rotate the model.

15 Rotate the camera until the furthest diagonal points of the image line up with the corresponding points on the model.

16 When the corners are exactly aligned, rotate, pan, and scale the model until it is aligned exactly with the image.

Note: Aligning the model with the image may take some time.

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A: Initial view of model and image
B: Rotated and aligned diagonals
C: Model almost aligned with image
D: Model and image aligned

17 Choose **Create > Camera** on the menu bar. This creates a camera using the current view's camera position.

Procedure: Extracting Rotation Values

We now extract the rotation values and add them to the views.xml file.

1 Do one of the following to display the camera's Information tab:

- Right-click the camera in the Scene tree, click **Object Properties**, and then click the Information tab.
- Double-click the camera in the Scene tree and click the Information tab.

2 The required rotation values are the View X, Y, and Z values.

```
View X="45.544"  Y="-157.116"  Z="179.941"
```

3 Copy and paste these values into the views.xml document. Note that clicking the 'Copy to Clipboard' button  copies all the information in this tab.

4 Add a name for the view and edit the XML as required.

Note: Editing the xml file is described at the beginning of the tutorial.

5 Save the file.

Congratulations! The next time Deep Exploration is opened; the custom view is displayed on the Views menu.

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