Photo to 3D Rotatable Object

In this lesson, we will explore the new "Rotate Object" feature in Adobe Photoshop, which allows you to convert 2D photos into 3D objects that can be rotated and manipulated in three-dimensional space.

Key Concepts Covered in This Lesson:

- **Rotate Object Feature (01:27):** Understand how to use this new Photoshop tool to transform a 2D image into a rotatable 3D object.
- **Select Subject (01:02):** Learn how the tool uses AI to automatically select the main subject of your image, which is crucial for the Rotate Object function.
- **3D Layer (01:39):** Recognize that Rotate Object creates a special layer that allows for 3D manipulation, distinct from standard Photoshop layers.
- **Low-Resolution Preview (02:10):** Be aware that during the rotation process, the image will be displayed in low resolution for faster manipulation.
- **Contextual Taskbar (03:41):** Utilize the contextual taskbar for quick access to rotation controls and to finalize the transformation.
- **Properties Panel (04:01):** Discover the additional rotation controls available in the Properties panel for more precise adjustments.
- **Free-Form Transformation (04:17):** Learn how to perform more fluid, unconstrained transformations by using right-click or Control-click.
- **High-Resolution Rendering (05:14):** Understand that once you finalize the rotation, Photoshop renders a high-resolution version of the object.
- **Generative Credits (05:53):** Be mindful that this feature consumes generative credits, with a certain number of free trials available.
- **Edit Rotation (06:17):** Know that you can re-edit the rotation of an object without incurring additional credit costs after the initial conversion.
- **3D Gaussian Splatting (44:32):** Gain insight into the underlying technology that enables the 2D to 3D transformation.
- **Defringe (43:13):** Learn how to use this feature to eliminate halos or fringing artifacts that can appear on the edges of transformed objects.

Getting Started with Rotate Object

The Rotate Object feature transforms a 2D photograph into a 3D object that can be rotated in any direction. This is particularly useful for compositing, allowing you to place an object from one photo into another at a different angle.

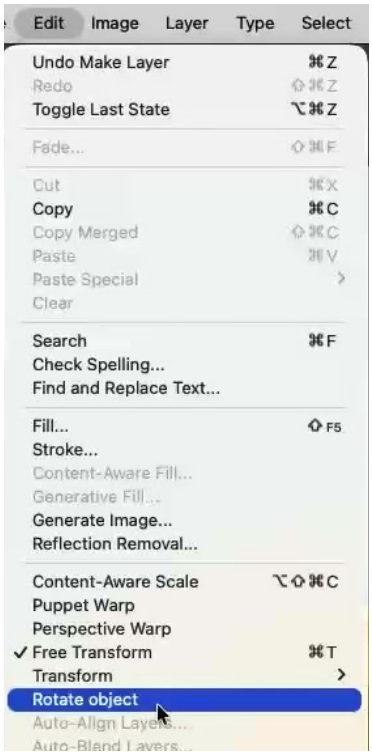
Preparing Your Image

Before you can use the Rotate Object feature, you need to ensure your layer is ready for transformation by doing one of the following:

1. **Unlock the Background Layer:** If you are working on a background layer, it will be locked. To enable transformations, you need to unlock it. This is typically done by double-clicking the layer or clicking a lock icon for the layer in the Layers panel.
2. **Make a Selection and Isolate to a New Layer:** The ideal workflow is to make a selection of the object you want to transform and place it on its own layer by choosing Layer>New>Layer Via Copy. This ensures that Photoshop knows exactly what you want to work with. If you don't make a selection, Photoshop will attempt to use its "Select Subject" feature to identify the object.

Initiating the Rotate Object Transformation

Once your image is prepared, you can begin the 3D transformation process.



1. **Access Rotate Object:** Navigate to the `Edit` menu and select `Rotate Object`. If the option is grayed out, ensure you are working not working on a layer called Background.
2. **Wait for Transformation:** Photoshop will process the image and convert it into a special 3D layer. This process might take some time, especially for complex images. During this stage, the image will appear in low resolution.

   Note: It's advisable to duplicate your layer before applying this transformation if you wish to preserve the original.

Manipulating the 3D Object

After the object has been converted to 3D, you can begin to manipulate its orientation and perspective.

Rotation Controls

The interface provides several controls for rotating your 3D object.

- **Blue Icons on the Canvas:** You'll notice blue icons on the image canvas that allow for manipulation.
  - **Horizontal Rotation:** The bottom icon allows you to rotate the object horizontally.
  - **Vertical Rotation:** The icon on the left enables vertical rotation.
  - **Perspective/Lens Distortion:** The icon on the right allows you to change the perspective, similar to adjusting a camera lens's zoom or controlling lens distortion. This affects how the front of the object appears in relation to its distance.

Contextual Taskbar Controls

The contextual taskbar offers quick access to these same rotation functions and more.

- **Rotate, Tilt, and Reset:** You can find controls for rotating, tilting, and returning the settings to their original position within the taskbar.

Properties Panel Controls

For more granular control, the Properties panel offers an additional rotation dimension.

- **Spin Around Center:** In addition to horizontal and vertical rotation, the Properties panel provides a control to spin the object around its center point. This is useful for fine-tuning after the main rotation is set.

Free-Form Transformation

For more dynamic manipulation, you can engage a free-form transformation mode.

- **Right-Click or Control-Click:** Instead of left-clicking, right-click (or Control-click on a Mac) on the object to enable free-form movement. This allows you to drag and reposition the object freely. For many trackpad users, a two-finger click often serves as the equivalent of a right-click.
- **Corner Handles:** Standard transformation handles are available at the corners, allowing you to resize and reposition the object more precisely.

Finalizing the Transformation

Once you are satisfied with the rotation and positioning, you can render the final high-resolution image. Click the "Done" button on the contextual taskbar, or press `Return` or `Enter` on your keyboard. Photoshop will then process the object to produce a high-resolution version based on your adjustments. This rendering process can take some time.

Credit Consumption

The Rotate Object feature uses generative credits.

- **Initial Conversion:** 20 credits are consumed only when the 2D image is initially converted into the special 3D layer.
- **Free Trials:** The first three uses of the feature do not deduct credits, allowing you to experiment freely.
- **Subsequent Edits:** Editing the rotation of an already converted 3D layer does not use additional credits.

Special 3D Layers

The feature creates a unique layer type that has specific characteristics.

- **3D Layer Icon:** These special layers are indicated by an icon in the lower-right corner of the layer thumbnail in the Layers panel.
- **Non-Destructive Editing:** You can re-edit the rotation of these layers by going to `Edit > Edit Rotation` or through the Properties panel without additional credit cost.

Creating Variations with Incremental Rotation

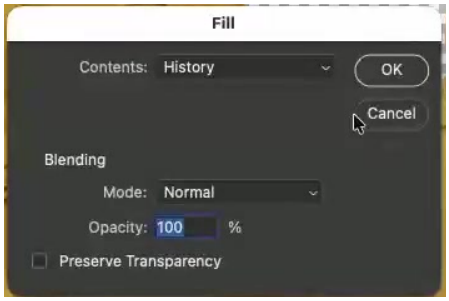
You can generate multiple versions of an object by applying incremental rotations.

1. **Apply Rotation:** Use the numerical controls in the Properties panel for precise rotation and enter 45 into the horizontal rotation field.
2. **Duplicate Layer:** Duplicate the 3D layer by typing Command-J (CTR-J on PC).
3. **Add Incremental Rotation:** With the duplicate layer active, click on the horizontal rotation field in the Properties panel and type +45 to the right of the value that is already in the field and press `Enter` twice.
4. **Repeat:** Continue duplicating and adding incremental rotations to create a series of variations.

Distortion and Artifacts
The AI's interpretation of 3D space can sometimes lead to unexpected distortions or artifacts, especially when rotating in multiple dimensions.

- **"Hallucinations":** The AI might add details or alter existing structures in ways that were not present in the original 2D image, especially when trying to reconstruct unseen parts.
- **Low-Resolution vs. High-Resolution Discrepancies:** Sometimes, the object looks correct in the low-resolution preview but develops artifacts when rendered at high resolution. This suggests that the AI might be "guessing" details during the high-resolution render.

Recovering the Original Layer
If you forget to duplicate your layer before converting it to 3D, there's a method to recover the original.



1. **Create a New Empty Layer:** Add a new, empty layer above your original image.
2. **Fill with History:** Go to `Edit > Fill`. Choose "History" as the fill option. This will fill the new layer with the state of your document when it was initially opened.

Example: Old Movie Projector
The AI successfully interpreted the round lens and the dual-sided reels of a movie projector. It also managed to recreate the feet of the projector, even though only one was clearly visible.

Example: Chair Rotation and Integration
To place a rotated chair into a new room, the process involved selecting the chair, rotating it, and then using layer masks to conceal parts of the chair that overlapped with existing elements in the new scene. The `Harmonize` feature was then used to adjust lighting and shadows to better match the new environment.

Example: Airplane Rotation
Rotating an airplane showed how the AI interprets unseen parts. In one instance, it seemed to add a third propeller blade and stabilization wires between the wings, indicating it's inferring details based on its training data.

Improving Selection Accuracy
The accuracy of the initial selection directly impacts the quality of the 3D object.

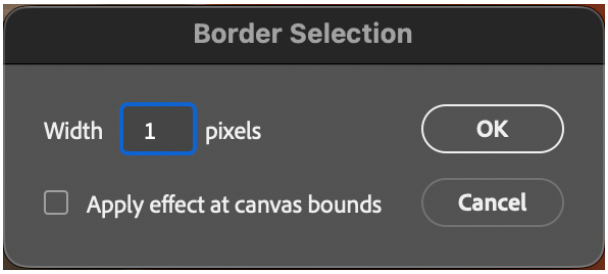
- **Object Selection Tool:** Use the Object Selection Tool to select your subject. Be aware that the preview may not be perfectly accurate, but the final selection often is.
- **Refining Selections:** If the results are not satisfactory, go back and refine your selection. Exclude areas that might confuse the AI, such as unwanted elements or hidden parts that the AI might misinterpret.

Masking for Integration
Layer masks are essential for seamlessly integrating the rotated object into a new scene.

- **Hiding Overlapping Areas:** Use layer masks to hide parts of the rotated object that should be behind other elements in the background scene.
- **Option/Alt Key for Masking:** To mask out selected areas, hold down the `Option` (Mac) or `Alt` (Windows) key while clicking the layer mask icon to invert the mask.

Dealing with Fringing Artifacts
Fringing, or halos, can appear on the edges of 3D layers when composited.

1. **Rasterize the Layer:** Before applying the defringe effect, convert the 3D layer into a regular pixel layer. Right-click on the layer in the Layers panel and choose `Rasterize Layer`. This removes the 3D functionality.
2. **Apply Defringe:** Go to `Layer > Matting > Defringe`. A dialog box will appear asking for the width of the fringe to remove. The default of one pixel is often sufficient.



Technical Requirements
For the Rotate Object feature to function, several conditions must be met:

- **8-Bit Documents:** The feature only works on 8-bit documents. If you have a 16-bit image, you'll need to convert it to 8-bit via `Image > Mode > 8-bit`.
- **Internet Connection:** This feature requires an active internet connection to function.
- **RGB Mode:** The document must be in RGB color mode. It will not work in CMYK or grayscale modes.
- **Pixel Layers:** The layer you are working on must contain pixels. Text layers or shape layers will not work directly. Converting them to smart objects might enable the feature.

Reasons for Feature Being Grayed Out
If the "Rotate Object" option is grayed out, consider these possibilities:

- **Layer Visibility or Opacity:** Ensure the layer you're working on is visible and has an opacity of 50% or higher.
- **Educational Accounts:** On some educational accounts, particularly K-12, this feature may be blocked. Higher education administrators can also choose to disable it.

Underlying Technology: 3D Gaussian Splatting
The core technology enabling this 2D to 3D transformation is known as 3D Gaussian Splatting. This method essentially breaks down a 2D image into numerous points in 3D space. These points can then be rotated and re-rendered, allowing for dynamic manipulation. The process is fast at low resolution but can be time-consuming for high-resolution renders.

The Rotate Object feature is a powerful new tool in Photoshop that significantly enhances creative possibilities for compositing and 3D manipulation. By understanding its functionalities, controls, and potential limitations, users can effectively transform 2D images into dynamic 3D objects. The ability to rotate, adjust perspective, and integrate these objects into new scenes, coupled with techniques for refining selections and resolving artifacts, makes this feature a valuable asset for digital artists and designers. While some challenges remain, particularly with complex geometries and AI interpretation, the ongoing development of such AI-driven tools promises even more sophisticated capabilities in the future.