

# Computer Graphics and Design

## Lecture 7

### Advanced Photo Manipulation Techniques

Lecturer: Baya, Trevor.

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#### Lecture Learning outcomes

- **Understand and apply adjustment layers:**

Learners will be able to use non-destructive adjustment layers (such as brightness/contrast, levels, curves, etc.) to correct and enhance images in Photoshop.

- **Create complex cutouts:**

Learners will demonstrate proficiency in isolating subjects from their backgrounds using various Photoshop tools, including the Pen Tool, Quick Selection Tool, Magic Wand, and Select Subject.

- **Add realistic shadows and reflections:**

Learners will be able to enhance their image composites by creating and refining realistic shadows and reflections, improving the overall integration of their cutouts with new backgrounds.

- **Export projects using appropriate file formats:**

Learners will export their Photoshop projects using suitable file formats for different purposes, such as web display (JPEG, PNG), high-quality printing (TIFF), and further editing (PSD).

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#### Creating Cutouts in Adobe Photoshop

## Definition of cutout

A **cutout** refers to an image or shape that has been isolated from its original background, creating a distinct object with a transparent or contrasting background. In visual arts, design, and photography, cutouts are often used to separate a subject (such as a person, object, or figure) from its background, making it easier to integrate the isolated image into different compositions or designs.

In digital editing (e.g., Photoshop), a cutout involves removing or masking parts of an image to highlight the subject, giving the appearance that it has been "cut out" from its original background.

## Creating Cutouts in Adobe Photoshop

Creating cutouts in Photoshop involves isolating a subject from its background, allowing you to place it on a different background or use it in a composite. Here are the common methods for creating cutouts:

### 1. Using the Quick Selection Tool

- **Step 1:** Select the **Quick Selection Tool** from the toolbar. It's usually grouped with the Magic Wand Tool.
- **Step 2:** Click and drag over the area you want to select. Photoshop will try to detect the edges automatically.
- **Step 3:** Refine the selection if needed by adding or subtracting areas using the **Add to Selection** or **Subtract from Selection** options.
- **Step 4:** Click **Select and Mask** in the options bar to refine the selection edges. Use the **Refine Edge Brush Tool** to improve the selection around hair or other complex edges.
- **Step 5:** Choose **Output to: Layer Mask** in the **Select and Mask** properties panel, then click **OK**.

### 2. Using the Pen Tool

- **Step 1:** Select the **Pen Tool** from the toolbar.
- **Step 2:** Carefully trace around the object by clicking to create anchor points and adjusting the curves.

- **Step 3:** Once you've completed the path, right-click inside the path and choose **Make Selection**.
- **Step 4:** Feather the selection by 1-2 pixels to soften the edges, then click **OK**.
- **Step 5:** Apply the selection as a layer mask by clicking the **Add Layer Mask** icon at the bottom of the layers panel.

### 3. Using the Magic Wand Tool

- **Step 1:** Select the **Magic Wand Tool** from the toolbar.
- **Step 2:** Click on the background or the area you want to remove. Adjust the **Tolerance** setting to capture more or fewer pixels.
- **Step 3:** If needed, use **Shift + Click** to add to the selection or **Alt + Click** to subtract from the selection.
- **Step 4:** Once the background is selected, you can **invert the selection** (Select > Inverse) to isolate the subject.
- **Step 5:** Click the **Add Layer Mask** icon to apply the mask.

### 4. Using Select Subject

- **Step 1:** Go to **Select > Subject**. Photoshop uses AI to detect the main subject in the image and creates a selection around it.
- **Step 2:** To refine the selection, click **Select and Mask** in the options bar.
- **Step 3:** Use tools like the **Refine Edge Brush Tool** to improve complex areas like hair.
- **Step 4:** Output the selection as a layer mask.

### 5. Using Channels for Complex Cutouts

- **Step 1:** Go to the **Channels** panel (Window > Channels).
- **Step 2:** Find the channel (Red, Green, or Blue) with the highest contrast between the subject and the background.
- **Step 3:** Duplicate the channel by dragging it to the **New Channel** icon.
- **Step 4:** Use **Levels** (Ctrl + L or Cmd + L) to increase the contrast even more.
- **Step 5:** Paint with black or white to refine the selection.

- **Step 6:** Load the channel as a selection by pressing **Ctrl + Click** (or **Cmd + Click** on Mac) on the channel thumbnail.
- **Step 7:** Return to the **Layers** panel and apply a layer mask.

## 6. Using the Lasso Tool

- **Step 1:** Select the **Lasso Tool** or **Polygonal Lasso Tool** from the toolbar.
- **Step 2:** Manually trace around the object to create a selection.
- **Step 3:** Once the selection is complete, apply a layer mask.

## 7. Refining the Cutout

- After creating the initial cutout, refining the edges is crucial. You can use:
  - **Select and Mask** to adjust the smoothness, feather, and contrast of the selection.
  - **Refine Edge Brush Tool** to enhance hair or fur.
  - **Layer Mask Properties** like **Feather** and **Density** to adjust the mask.

## 8. Adding a New Background

- After creating the cutout, you can add a new background by dragging a different image into the document.
- Position the new background layer below the cutout layer.

Cutouts can be used for various creative projects, like photo manipulations, compositing, or product photography.

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## Adding shadows and reflections to your cutout.

Adding shadows and reflections to a cutout in Photoshop can enhance realism and make your composite image look more convincing. Here's a step-by-step guide on how to achieve both effects:

### 1. Adding Shadows

There are different types of shadows you can create: **drop shadows** (for softer shadows that appear close to the subject) or **cast shadows** (for longer, directional shadows). Here's how to create them:

#### Method A: Drop Shadow (Layer Style)

1. **Step 1:** Select the layer with your cutout.
2. **Step 2:** Go to **Layer > Layer Style > Drop Shadow**.
3. **Step 3:** In the **Layer Style** dialog box, adjust the following settings:
  - **Angle:** Set the light source direction.
  - **Distance:** Controls how far the shadow is from the cutout.
  - **Spread:** Adjusts the size of the shadow edges.
  - **Size:** Controls the softness of the shadow edges.
  - **Opacity:** Controls the darkness of the shadow.
4. **Step 4:** Fine-tune these settings to achieve the desired shadow effect.

### **Method B: Cast Shadow (Manual)**

1. **Step 1:** Create a new layer below the cutout.
2. **Step 2:** Use the **Brush Tool (B)** with a soft round brush to paint a black or dark gray shadow under the cutout.
3. **Step 3:** Lower the **Opacity** of the shadow layer to make it more realistic.
4. **Step 4:** Use the **Gaussian Blur filter** (Filter > Blur > Gaussian Blur) to soften the edges of the shadow.
5. **Step 5:** For directional shadows, use the **Transform Tool (Ctrl + T or Cmd + T)** to skew, distort, or warp the shadow into place, mimicking how a real shadow would fall on the ground.

## **2. Adding Reflections**

Reflections are commonly used for objects on shiny or glossy surfaces. Here's how to create a reflection:

1. **Step 1: Duplicate the cutout layer** by right-clicking the layer and choosing **Duplicate Layer**.
2. **Step 2: Flip the duplicated layer vertically** (Edit > Transform > Flip Vertical).
3. **Step 3:** Move the flipped layer down so it appears like a reflection below the original cutout.
4. **Step 4:** Lower the **Opacity** of the reflection layer to make it look realistic (around 30-50% opacity).
5. **Step 5:** Apply a **layer mask** to the reflection layer and use a **black-to-white gradient** to gradually fade the reflection away from the original cutout.

6. **Step 6:** Optionally, add some **Gaussian Blur** to the reflection to simulate the look of a reflective surface.

### 3. Refining Shadows and Reflections

- **Blend Modes:** For shadows, try setting the **blend mode** of the shadow layer to **Multiply** for a more realistic look.
- **Layer Masks:** Use **layer masks** on both shadows and reflections to blend them better with the background, especially if the surface isn't perfectly flat.
- **Distort/Transform:** Adjust the shape of the shadows or reflections using **Transform** (Ctrl + T or Cmd + T) to better match the light source and perspective.

### 4. Adding a Grounding Shadow (Ambient Shadow)

To make the cutout look grounded, you can add an **ambient shadow** where the object touches the surface:

1. **Step 1:** Create a new layer below the cutout.
2. **Step 2:** Use a **soft brush** with low opacity to paint a dark gray or black shadow directly below the object.
3. **Step 3:** Apply **Gaussian Blur** to soften the shadow edges and lower the **opacity** to make it subtle.

Adding shadows and reflections can significantly enhance the realism of your cutout, making it blend seamlessly with the new background or scene.

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## Exporting and File Formats in Photoshop

When working with Photoshop, understanding how to export your work and choosing the appropriate file format is essential for maintaining quality and compatibility across different platforms. Here's a summary of exporting options and common file formats:

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### Exporting in Photoshop

1. **Export As...**
  - **Location:** File > Export > Export As...
  - Allows you to export your work into different file formats with control over the size, resolution, and metadata.
  - You can preview the exported image and adjust settings like:

- **File format:** JPEG, PNG, GIF, or SVG.
- **Image size:** Resize the output dimensions.
- **Color space:** Convert to sRGB for web display.

## 2. Save for Web (Legacy)

- **Location:** File > Export > Save for Web (Legacy)...
- Used for web-optimized images with control over compression settings, color profiles, and file size.
- Supports JPEG, PNG-8, PNG-24, GIF, and WBMP formats.

## 3. Save As...

- **Location:** File > Save As...
- Saves the current project in the desired format. It's ideal for archival purposes or changing the file format (e.g., from PSD to PNG).

## 4. Export Layers to Files

- **Location:** File > Export > Layers to Files...
- Exports each Photoshop layer as a separate file. Useful when dealing with animations, sprite sheets, or multiple image assets.

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## Common File Formats in Photoshop

### 1. PSD (Photoshop Document)

- **Use:** Native file format for Photoshop. Supports layers, masks, adjustment layers, and effects.
- **Best For:** Editing files within Photoshop. Keep a PSD copy to maintain layers for future edits.

### 2. JPEG (Joint Photographic Experts Group)

- **Use:** Compressed format ideal for photographs and web use.
- **Best For:** Sharing images online or printing with small file sizes.
- **Limitations:** Lossy compression reduces quality with each save.

### 3. PNG (Portable Network Graphics)

- **Use:** Lossless format that supports transparency.
- **Best For:** Web graphics, logos, and icons that need transparent backgrounds.

- **Limitations:** Larger file size than JPEG.
4. **GIF (Graphics Interchange Format)**
    - **Use:** Supports animation and transparency but limited to 256 colors.
    - **Best For:** Simple web animations or low-color images.
    - **Limitations:** Limited color depth.
  5. **TIFF (Tagged Image File Format)**
    - **Use:** High-quality, lossless format often used in print production.
    - **Best For:** Large prints or archival purposes.
    - **Limitations:** Large file sizes.
  6. **PDF (Portable Document Format)**
    - **Use:** Encapsulates images and text for distribution and printing.
    - **Best For:** Printable documents or image portfolios.
    - **Limitations:** May flatten layers depending on export settings.
  7. **SVG (Scalable Vector Graphics)**
    - **Use:** Vector format commonly used for web graphics and logos.
    - **Best For:** Icons and scalable images on the web.
    - **Limitations:** Not suitable for complex raster images.
  8. **RAW**
    - **Use:** Unprocessed image data from a camera.
    - **Best For:** Photographers who want full control over post-processing.
    - **Limitations:** Requires special software (like Photoshop or Lightroom) to open and edit.

### Choosing the Right Format Based on Use Case

Use Case	Recommended Format
Editing and Future Use	PSD
Web Use (Photos and Graphics)	JPEG, PNG
Web Animation	GIF
High-Quality Printing	TIFF
Print and Share Documents	PDF

Use Case	Recommended Format
Camera Image Processing	RAW
Scalable Web Graphics	SVG

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## Conclusion

The correct exporting process and file format depend on the specific purpose of the project, whether it's for web display, print, or future editing. Using the appropriate format ensures you retain the necessary quality and compatibility. Always keep a **PSD** version for edits and export in other formats as needed for sharing or publishing.

In this lecture on advanced photo manipulation techniques, you've gained essential skills for enhancing, correcting, and creatively transforming images using Photoshop. Through the use of adjustment layers, you can make non-destructive edits, allowing for flexibility in image editing. You've also learned various methods for creating precise cutouts, an invaluable skill for compositing. Furthermore, the addition of realistic shadows and reflections elevates your work, adding depth and making your images more convincing. Finally, understanding the appropriate file formats for exporting ensures that your projects are optimized for both web and print applications while preserving quality. These techniques provide a solid foundation for more sophisticated graphic design and photo manipulation tasks in your future projects.

## References:

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