

# 2D Imaging Applications for Visualization

Imaging formats fall into two main categories, **raster** and **vector** graphics.

## Raster

- Composed of pixels
- Wide color gamut
- Highly detailed
- Complex images (photos, scans)

## Vector

- Composed of procedural shapes
- Easy to color separate for print
- Scalable
- Crisp images (illustrations, charts)

The leading applications for producing raster and vector images are Adobe Products; Photoshop for raster graphics, and Illustrator for vector graphics. Though the applications serve different purposes, their files can be used interchangeably between applications and combined into a final image composed of both raster and vector graphics. As a student, you are entitled to discounted pricing on Adobes software suite.

[www.adobe.com/creativecloud/buy/students.html](http://www.adobe.com/creativecloud/buy/students.html)

## Interface



Adobe applications and most other 2D imaging applications follow similar user interface conventions. The center panel contains the main document window, the tool bar sits on the left of the pane, options for the current tool sit above the pane, and info palettes sit to the right of the pane. The interface can be reconfigured to suit your needs. Use the Window menu to open additional information windows and arrange them to your needs.

## Document Setup

It is important to understand the target for your image to set up and save your documents correctly. Both Photoshop and Illustrator offer a many options for customizing documents, however in general you will be either creating graphics for display on a screen or for a document that may be printed.

## For Screen



Color: RGB  
Unit: pixels  
DPI: 72-600

## For Print



Color: CMYK  
Unit: in,cm,mm  
DPI: 300-2880

## Working with Images

We will quickly create a vector image in Adobe Illustrator, transfer it to Photoshop, apply some effects, and save it as a raster image.

### 1: Create a new vector image in Illustrator

- In Illustrator, select **File->New**.
- In the New Document window, set Width to **1920** and height to **1080**.
- Click **Create**.

### 2: Add text to the image in Illustrator

- Select the **Type Tool** from the tool palette (the 'T' button).
- Click in the document window to place text.
- In the tool bar above your document, select a font, set its style to **Bold** if available.
- Set point size to **72**.
- Click the **Fill Color** in the tool bar and set it to **None** (the box with a red slash).
- Click the **Stroke Color** next to the fill color and set it to **Black**.
- Click the **Stroke Size** next to Stroke Color and set it to **8 pt**.
- Hold shift and type anything you like, perhaps your name.

### 3: Modify the text object in Illustrator

- Click the dark arrow icon in the very top corner of the toolbox to enable the **Selection** tool.
- Click on the text to select it.
- Press **Ctrl+x** to cut the text.
- Press **Ctrl+v** to paste the text. The text should now be centered in the document window.
- From the **Type** menu, select **Create Outlines**, or press **Ctrl+Shift+O**. This will convert the text into an outline shape.
- From the **Object** menu, select **Transform->Scale**.
- In the dialogue box that appears, type **500%** into the uniform scale box.
- Click **OK**.

### 4: Create a new raster image in Photoshop

- In Photoshop, select **File->New**.
- In the New Document window, set Width to **1920** and height to **1080**.
- Click **Create**.

### 5: Using filters and adjustments in Photoshop

- Set the **Background** and **Foreground** colors at the bottom of the tool palette to two bright colors of your choice.

- From the **Filter** menu, select **Render->Difference Clouds**. The document should have a brightly colored cloud pattern.
- From the **Image** menu select **Adjustments->Vibrance**
- Adjust the **Vibrance** slider to the right.
- Adjust the **Saturation** slider to the right to brighten and saturate the cloud colors.
- Click **OK**.

## 6: Moving elements between Illustrator and Photoshop

- Back in **Illustrator**, select the text shape by pressing **Ctrl+Shift+O** to enable the selection tool and clicking the shape
- Press **Ctrl+c** to copy the shape.
- In **Photoshop**, press **Ctrl+v** to paste the text shape over the clouds.
- In the paste dialogue that appears, select **Pixels** and press **OK**.
- Press **Enter** to finalize placement. The text has been converted from a vector shape in Illustrator to a raster layer in Photoshop.

## 7: Working with Layers

- The new layer containing the text shape should be selected in the **Layers Panel**.
- Double click the layer name (Layer 1) in the **Layers Panel** and rename the layer to **Text**.
- From the **Image Menu** select **Adjustments->Invert**. The text outline should turn white.
- Right click the Layer named **Text** in the **Layers Panel**.
- Select **Duplicate Layer**.
- Type **Glow** into the name field of the duplicate layer dialogue.
- Click **OK**.
- Select the **Background** layer.
- Click the **New Layer** icon at the bottom of the **Layers Panel** (square icon with upturned corner).
- Double click the name of the new layer in the **Layers Panel**.
- Change the name of the layer to **Mask**.
- You should now have four layers; **Background**, **Mask**, **Text** and **Glow**

## 8: Selections and Editing Layers

- Select the **Glow** layer
- From the **Filter** menu, select **Blur->Gaussian Blur**.
- Set the **Radius** value in the Gaussian Blur dialogue to **4.0**
- Click **OK**.
- Select the **Text** layer in the **Layers Panel**.
- Press **w** to enable the **Magic Wand** selection tool.
- Click outside of your text in the document window to select the empty space around your text. If some letters have an enclosure such as the middle of the letter 'O' you will need to **Shift+click** in those areas to add them to the selection.
- From the **Select** menu select **Modify->Expand**.
- In the **Expand Selection** dialogue that appears, set amount to **3**.
- Click **OK**.
- In the **Layers Panel**, select the **Mask** layer.
- Set the **Foreground** color to black or any complimentary color of your choice.

- From the **Image** menu, select **Fill**, to fill the selected area of the **Mask** layer with the foreground color.
- Click **OK** in the **Fill** dialogue box.

## **Raster Graphics (Photoshop) Alternatives**

### **Free**

- Gnu Image Manipulation Program (GIMP) - [gimp.org](http://gimp.org)
- Krita – [krita.org](http://krita.org)

### **Commercial**

- Corel PaintShop Pro – [paintshoppro.com](http://paintshoppro.com)
- ArtRage – [artrage.com](http://artrage.com)

## **Vector Graphics (Illustrator) Alternatives**

### **Free**

- Inkscape – [inkscape.org](http://inkscape.org)
- Krita – [krita.org](http://krita.org)

### **Commercial**

- Corel Draw – [corel.com](http://corel.com)