Video Editing

- Introduction to After Effects
- Video Editing Terminology
- Exporting Compositions

After Effects

Welcome to one of the most difficult softwares to master. Before any major film hits the big screen, it stops by After Effects at some point during its lifetime. As the name implies, After Effects handles **post-processing effects**, but we will be using it for much more.

After Effects is a massive software. With hundreds of plugins and even more third-party apps and effects, After Effects boasts **the largest visual effects library**.

After Effects links together resources from all other Adobe Software, and with direct access to **Media Encoder**, can render footage in **tens of different formats.**

Composition Setup

Compositions manage all the layers in your video, including **video footage, audio, imported graphics, images, vectors, shape layers, solid objects, adjustment layers**, and more.

Width/Height specifies the size in pixels of the composition.

Aspect Ratio is Width:Height

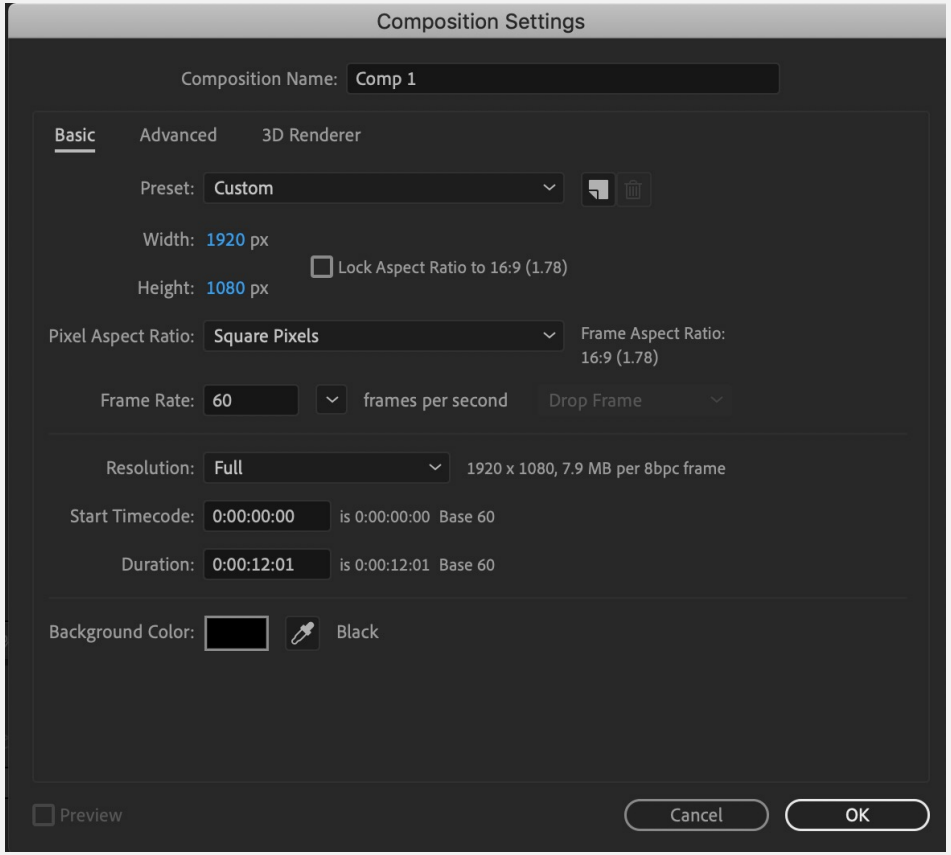
Frame Rate specifies the frames per second.

Resolution specifies the viewing quality in the program (independent from export quality).

Start Timecode and **Duration** specifies the start time index and temporal length of the composition.

Units of Hours:Minutes:Seconds:Frames

Background Color is the background color of the composition.



After Effects Composition Creation

Layer Generation

Layers can be imported as footage, external media, or generated as graphics.

Text is a 2D text field with user-defined font parameters and typography stylings.

Solid is a 2D solid color layer.

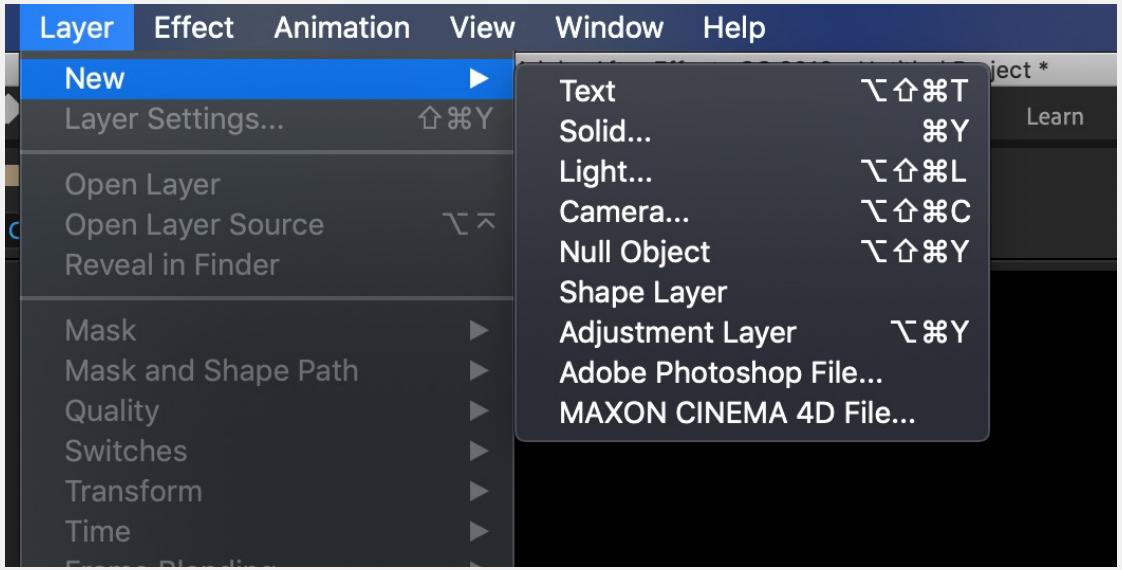
Light is a 3D light source that interacts with other layers in the system. Only works in 3D settings.

Camera is a 3D viewing frame that interacts only with 3D layers.

Null Object is a 2D anchor point shared by other layers.

Shape Layer is a 2D solid in the form of a shape.

Adjustment Layer is a clear 2D layer that translates any effects applied to it down to the layers beneath it.



After Effects Layers

Timeline Editing

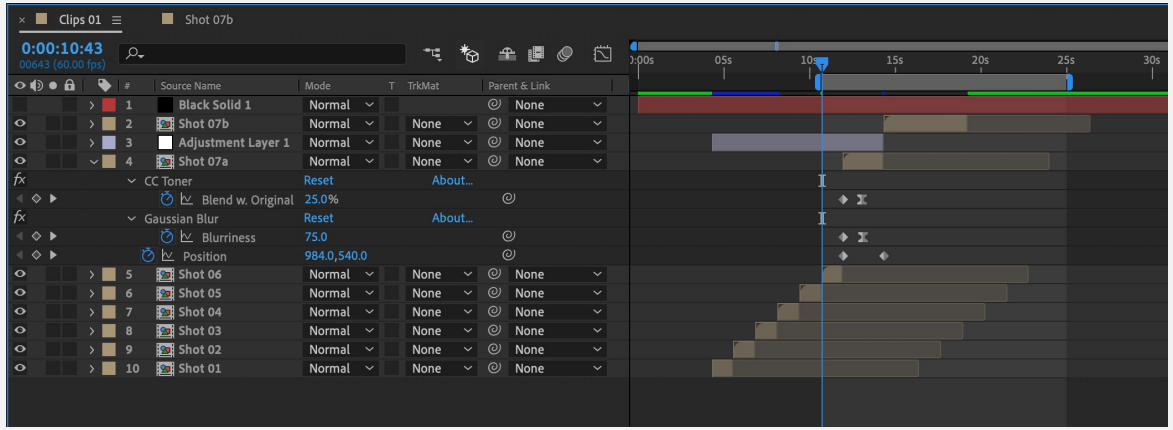
The **Timeline** is where all the layer timing, display, and transformation properties are managed.

Keyframes can be applied to each layer and any one of its properties. Specific interpolation properties can be modified using the **Motion Editor**.

Motion Blur can be toggled for any layers with motion involved (keyframes on rotation, scaling, or position).

Layers can be **parented** to other layers. Any **transformations** applied to the parent layer are **carried down** to the child layers. Each layer can only have **one parent**.

More on this when we talk about terminology.



After Effects Timeline

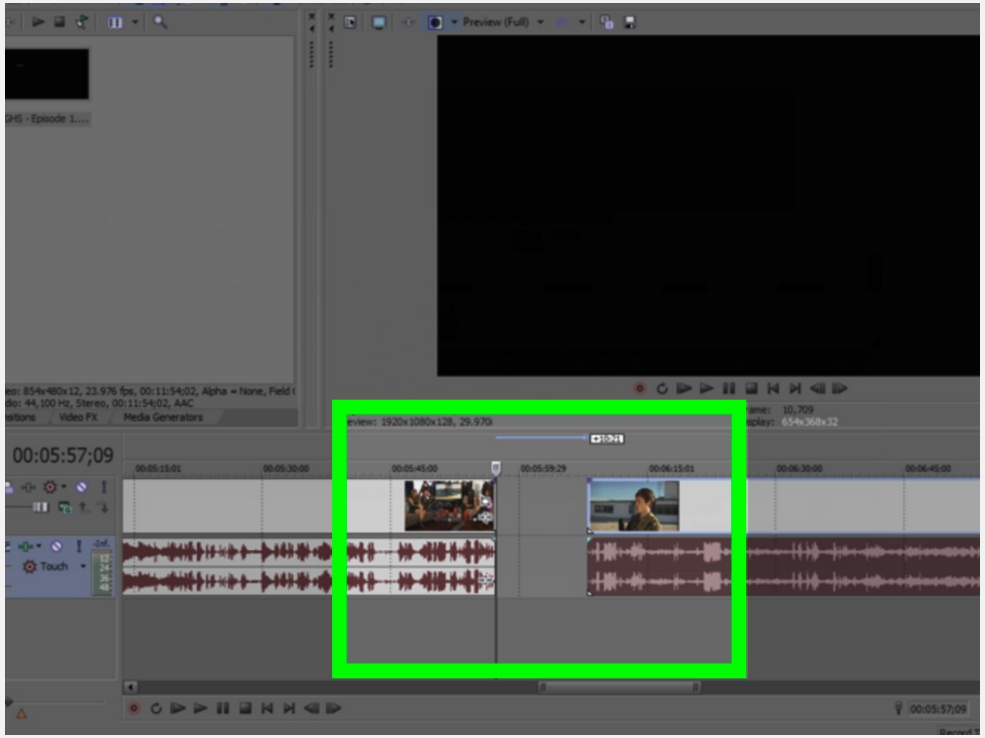
- ~~Introduction to After Effects~~
- Video Editing Terminology
- Exporting Compositions

Clip Splicing

Clip Splicing is the act of **separating** a clip into a two separate clips at a specific point in the clip's time.

More generally, clip splicing is starting from multiple pieces of footage and splicing them to only include the **relevant** parts in your video.

Clip Splicing can go a long way to tell a story, even **without fancy transitions or effects**. It puts more emphasis on the clips used rather than any assisting or guiding effects.



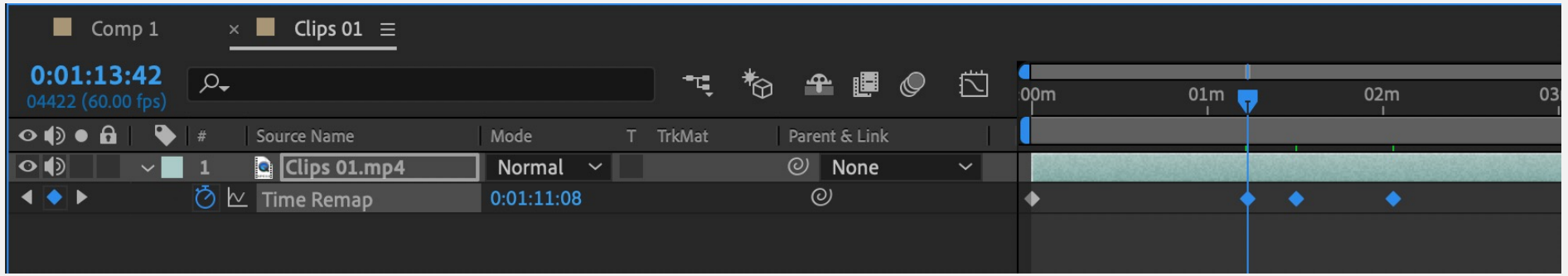
Sony Vegas

Time Remapping

Time Remapping is the act of changing the playback speed of clips.

Playback speed is specified in **frames per second**. Slowing down a clip plays less frames per second but does nothing to produce additional in-between frames. Footage playback will appear **choppier**.

After Effects allows time remapping to be keyframed, where the frame rate changes **dynamically** over time.



After Effects Timeline

Transformations

Transformations are keyframe-able properties that change the presentation of layers on screen.

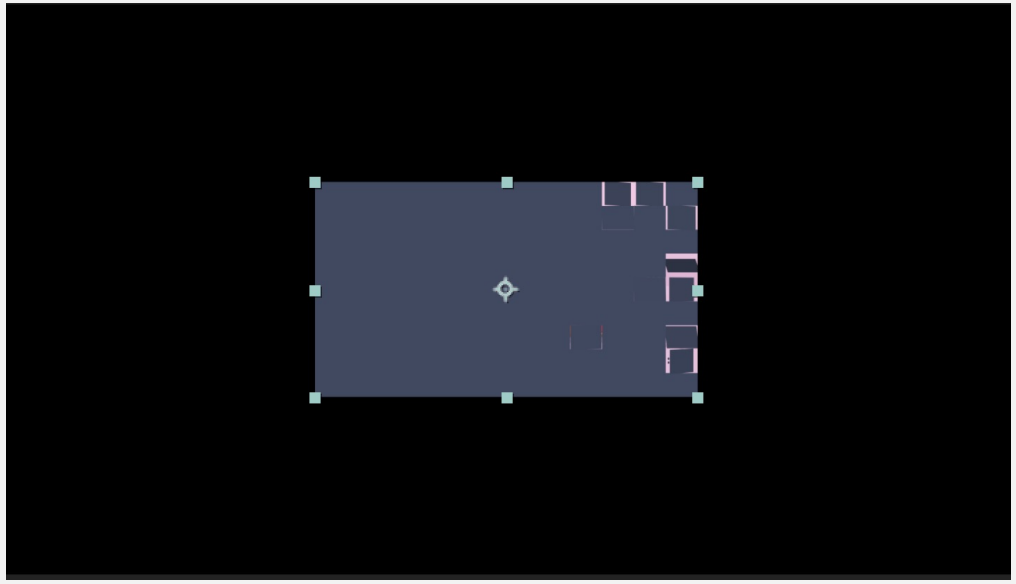
Anchor Point is the center point of the object. Think of it as the pin holding up the layer on a pin-board

Position is the location of a layer in 2D space relative to the Anchor Point.

Rotation is the orientation of an object in 2D space relative to the Anchor Point.

Scale is the size of an object in 2D space relative to the Anchor Point.

Opacity is the transparency of an object.



After Effects Display

3D Transformations

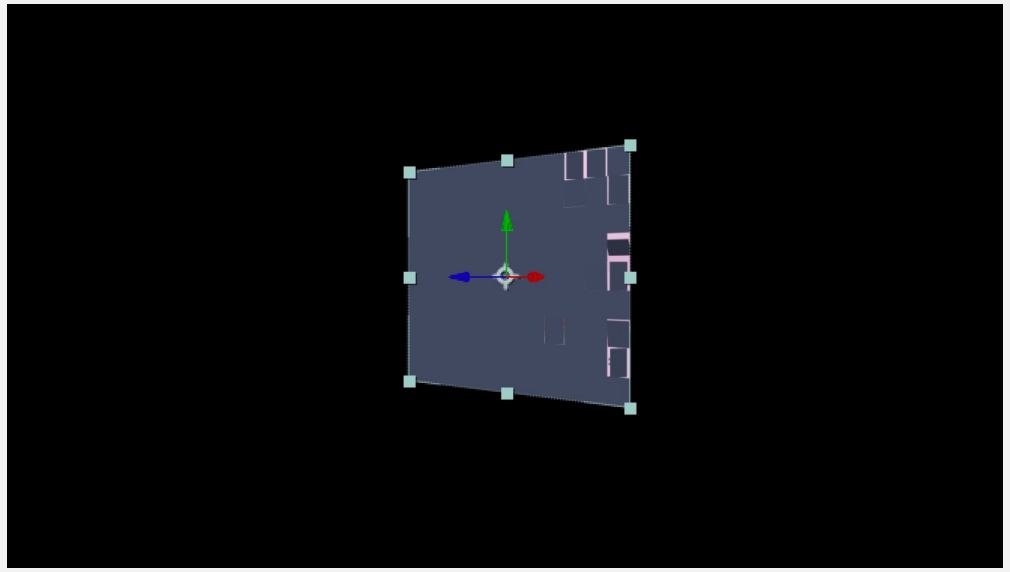
3D Transformations are keyframe-able properties that can be modified in 3D space.

Anchor Point is the 3D center point of the object.

Position is the location of a layer in 3D space relative to the Anchor Point.

Rotation is the orientation of an object in 3D space relative to the Anchor Point.

Scale is the size of an object in 3D space relative to the Anchor Point.



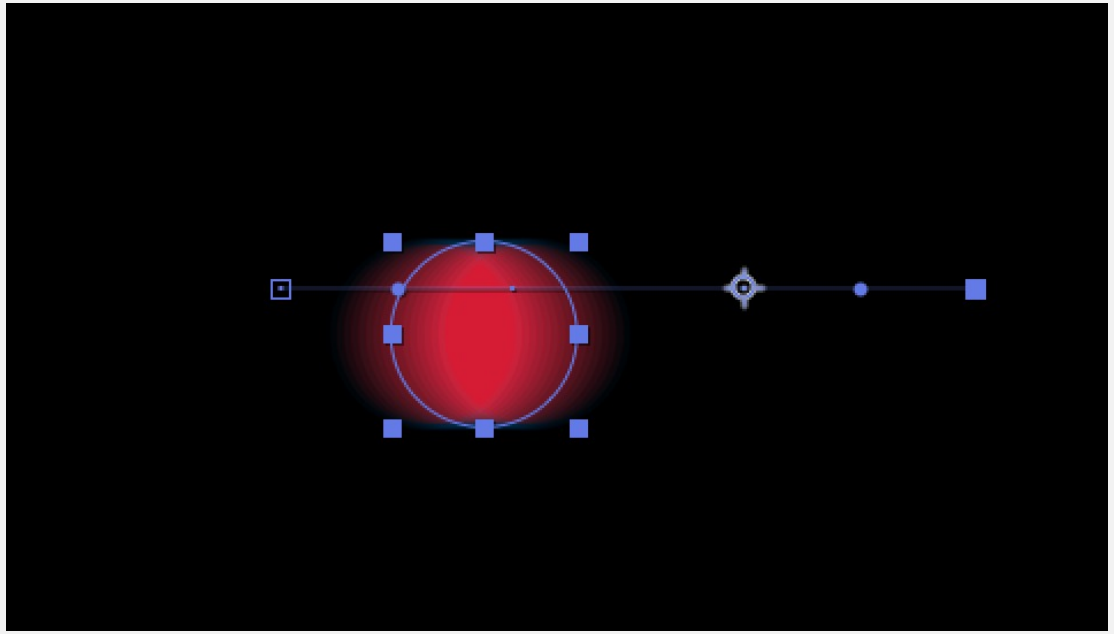
After Effects Display

Motion Blur

Motion Blur is the **directional blur** caused by moving objects.

Software's will **automatically** calculate motion blur based on **speed** and **direction**.

Motion Blur is configured to work on standard transformations such as **position**, **rotation**, & **scale**, as well as their **3D equivalent**.



After Effects Motion Blur

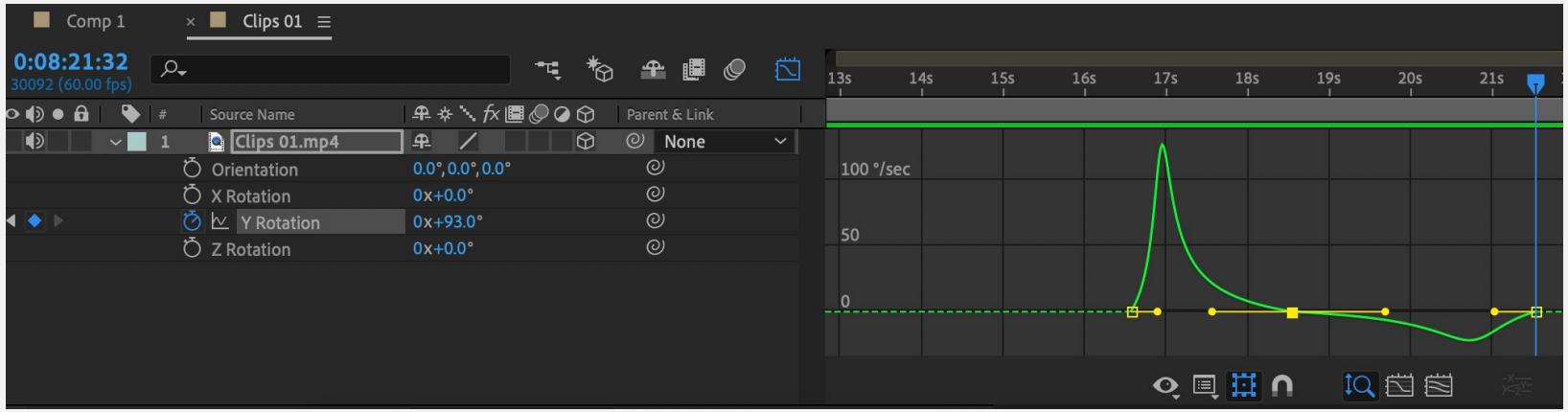
Motion Editing

Motion Editing is a visualization of the motion graphs associated with the speed and accelerations of a keyframed motion.

Motion graphs are a sequence of **cubic polynomials** with tangents at each keyframe.

Can view a **speed-based** graph or **value-based** graph.

Tangents of value-based graphs represent speed. Tangents of speed-based graphs represent acceleration.



After Effects Motion Editor

Masking

Masking allows you to show/hide parts of your layer, giving you the flexibility to **pick what is visible**.

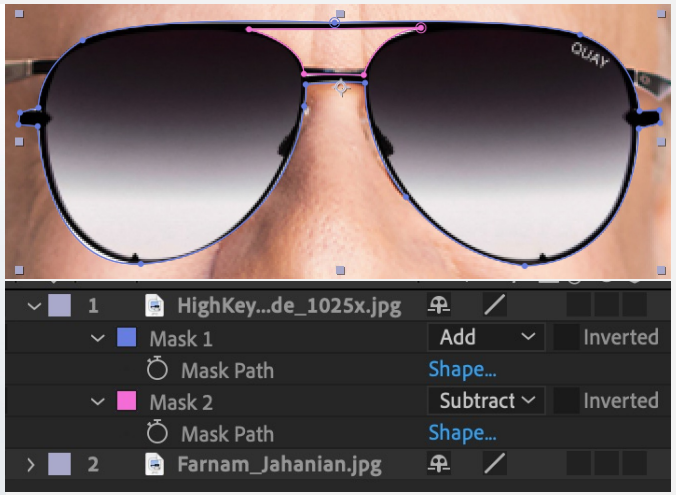
Multiple masks can be **applied** to one layer.

Masks can be **additive** or **subtractive**.

Masks are also comprised of **cubic polynomials** with **tangents** at every key-point. Very similar interface to **vectoring**.

Can **feather** a mask to create a soft edge.

Keyframe-able, but some complex motions like head-turns can't be keyframe-tracked. Can we do better? (Hint: yes)



Multiple masks to a single layer

Matte

Mattes use another image to help set the **opacity** at every pixel. Mattes are **stronger** than Masks.

A **Mask** is a **Matte**, a **Matte** is not a **Mask**.
(Example: everything inside a mask has an opacity of 1, everything outside has an opacity of 0).

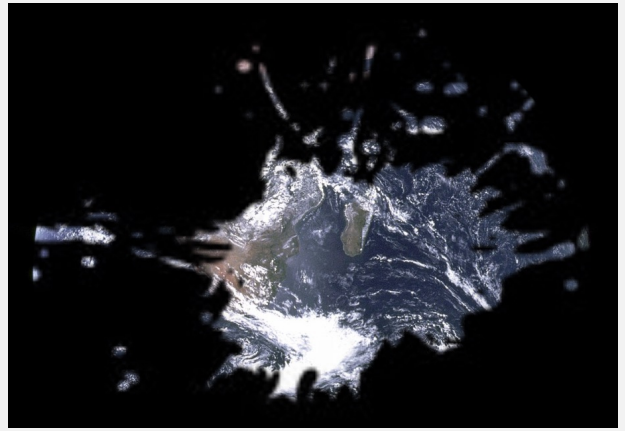
4 types of Mattes:

Alpha Matte: src opacity = matte opacity.

Alpha Inv Matte: src opacity = 1 - matte opacity.

Luminance Matte: src opacity = matte lum.

Luminance Inv Matte: src opacity = 1 - matte lum.



What kind of matte is this?

Rotoscoping

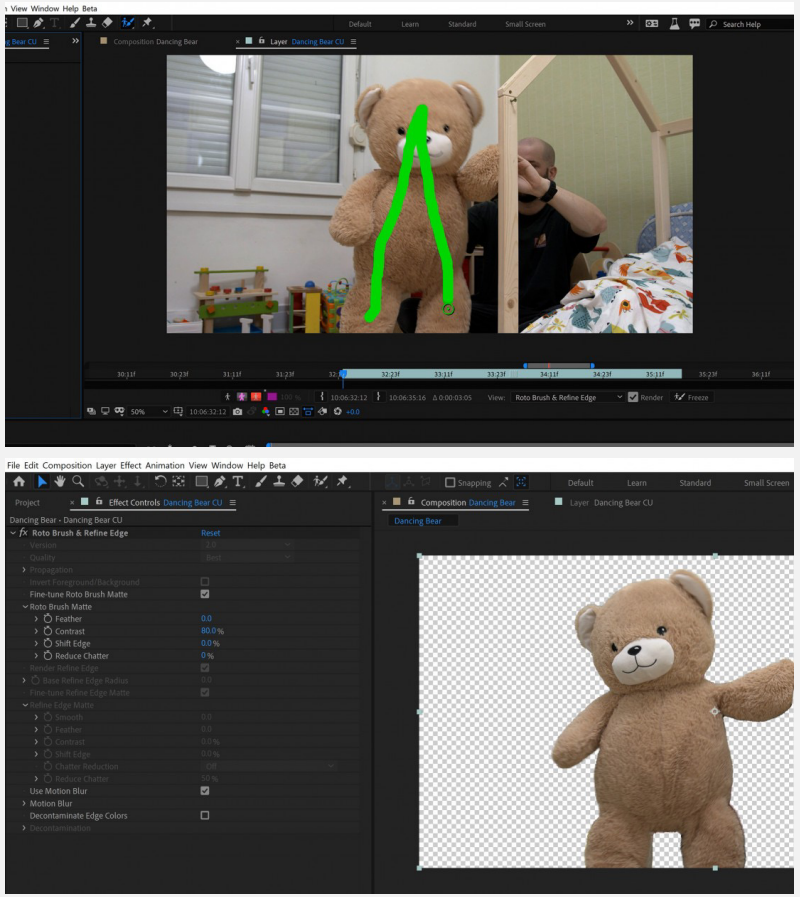
Recall **rotoscoping** is the process of creating animating by **tracing** over footage frame by frame.

AE uses the same idea of drawing over frames to create a mask. This tool is known as the **rotobrush**.

Can draw both **additive** and **subtractive** regions of the frame.

Rotobrush uses **scene-understanding** and **contrast detection** to estimate the rotoscoped region of future frames. Draw one frame, and correct future frames.

Rotobrush 2.0 (2020) uses **AI** for better scene-understanding, but legacy projects still support the old rotobrush.



Rotobrush in AE

Motion Tracking

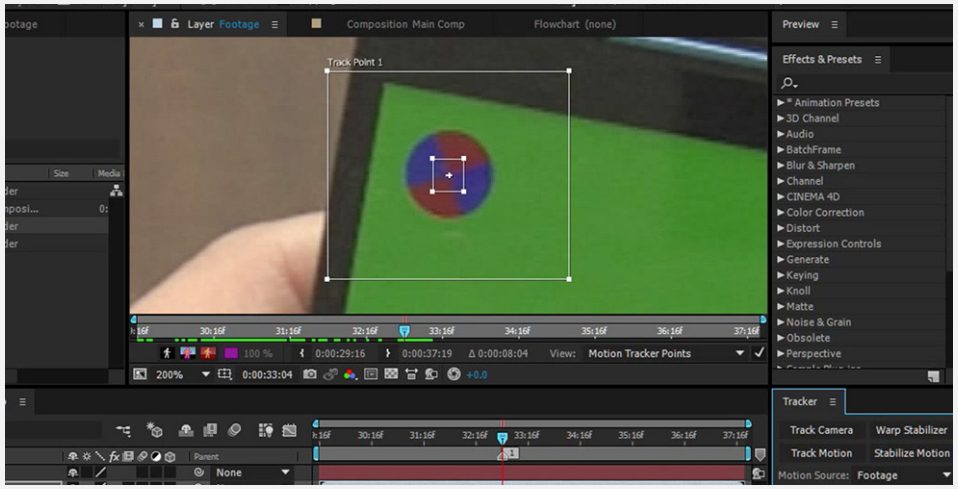
Motion Tracking allows you to get keyframe data on an object of interest in an exported video.

Dedicated window in AE.

Specify on the initial frame what you want to track, and watch AE slowly track the object in consecutive frames. Pause and correct if the tracking loses the object of interest.

Tracking specified by an **inner** and **outer box**. Inner box should be the **size of the object** the tracker should look for, outer box is the **search space**.

Underlying architecture is **Lucas-Kanade** (for CV nerds)



Tracking UI in AE

Puppet Tool

The **Puppet Tool** allows you to animate any 2D layer by **distorting** localized regions of the shape

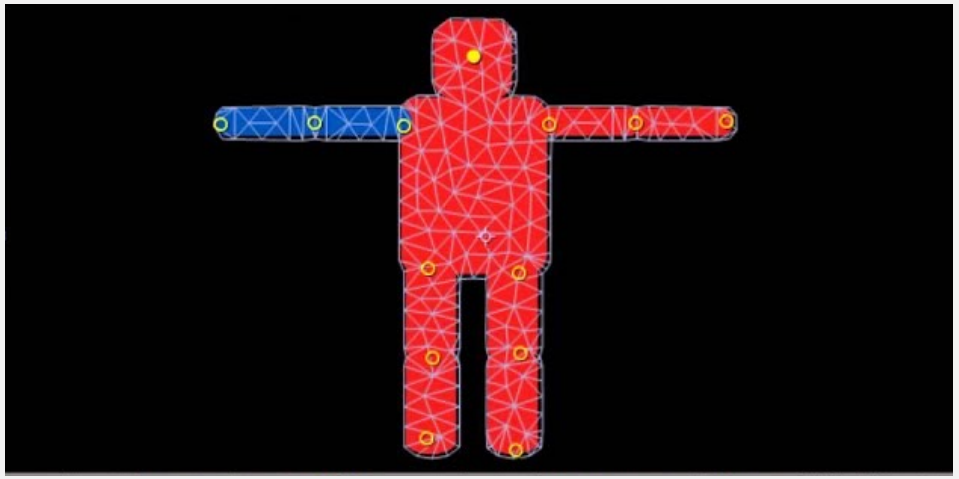
3D blend skinning but for **2D layers**.

The layer is **automatically triangulated** by minimizing variance of vertex angles & triangle areas.

User places **pins** onto the mesh, which is loosely referred to as the **rigging** stage.

When a pin is moved, all triangles nearby to that pin move with it.

Pins are **keyframe-able**, allowing you to create animations.



Puppeting a layer in AE

& Much More

Optical Flow
- Warp Stabilization
- Video Interpolation

Keying
- Key-light
- Linear Color Key
- Chokers

Distort
- Displacement Maps
- Random Noise
- Directional Blur
- Optics Compensation
- Wiggle

Color Correction
- Toners
- Color to Color
- Glows

Generative
- Particle Systems
- Audio Waveforms
- Strokes

Visual Overlays
- Lens Flares
- Drop Shadows
- Vignettes

Transitions
- Gradient Wipe
- Block Dissolve
- Linear/Radial Wipe

3D
- Cinema 4D Integration

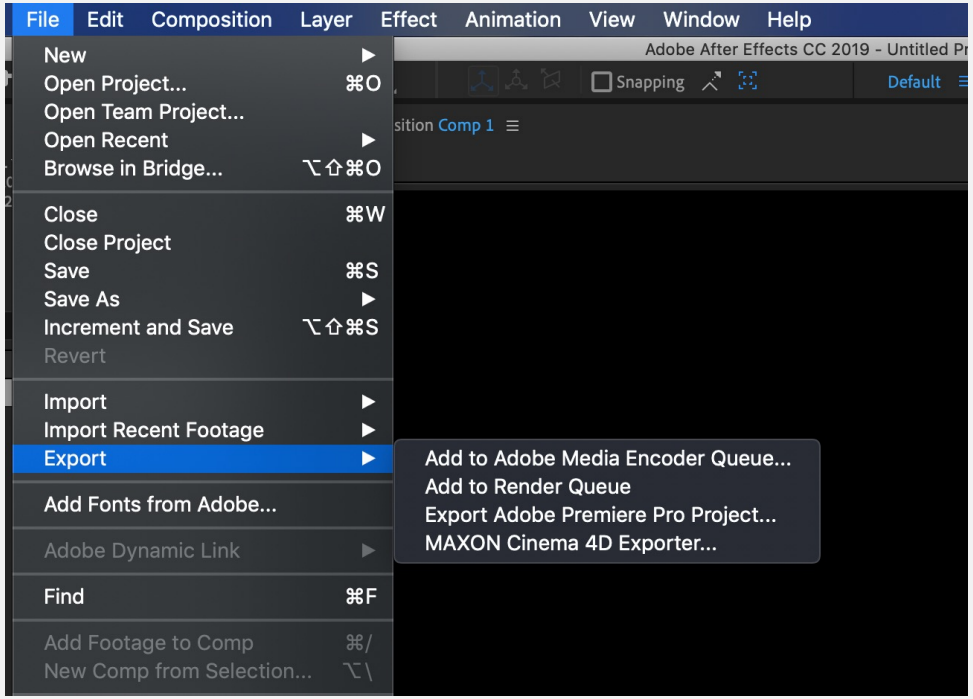
- ~~Introduction to After Effects~~
- ~~Video Editing Terminology~~
- Exporting Compositions

Exporting Options

After Effects comes with a few different exporting options for rendering footage into a video media sharing format or to work on in another program.

Adobe Render Queue is the built-in rendering platform that used to be the default until Creative Cloud's release in 2014. Since then, many export formats have been deprecated, and is now mainly used for image sequence and audio exporting.

Adobe Media Encoder Queue is the new external application that supports nearly all audio and video formats. It is a stand-alone app, allowing editors to render as they continue to work on their compositions.



After Effects Exporting

Media Encoder

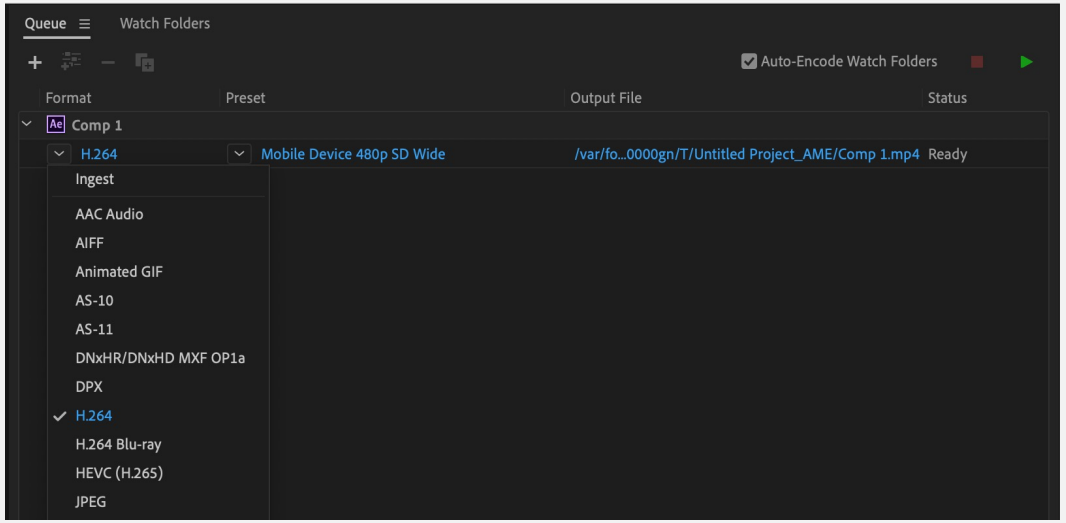
Adobe Media Encoder was introduced with After Effects since the Creative Cloud update, and downloads automatically with After Effects.

When exporting a clip, you can select the **render format**, **quality**, and **directory** to save to.

For this course, make sure to use **H.264** (.mp4) format with **high quality**.

The exporter is structured like a **queue**: add multiple compositions and watch them render in the order they were added.

You can render a composition and still work on it. Be advised that the composition will be rendered in the state it was in when it was added to the queue.



Media Encoder

Homework

- ❑ With found footage, use clip splicing to extract key components and stitch together a new story.
- ❑ Build custom transitions into your timeline from transformation properties.
- ❑ Experiment with keyframing and the motion editor.
- ❑ Render the composition to H.264 with specs specified on the syllabus.
- ❑ Upload the resulting .mp4 to the course Drive.

Questions?

Live Demo