

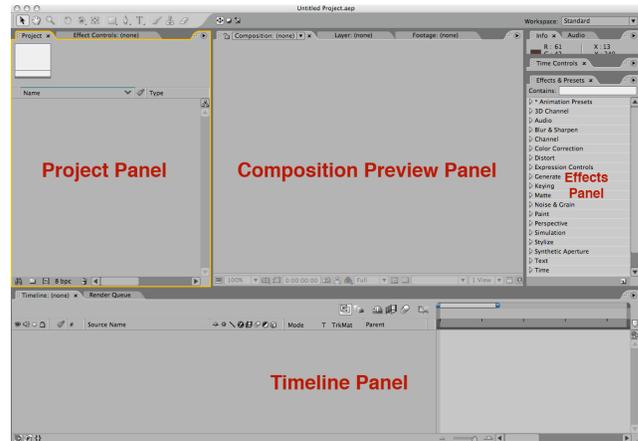
## After Effects Compositing Basics

This tutorial is a continuation of the “Villus Capillary” tutorial where you went through the basics of creating a Maya scene from A-to-Z. You’re now ready to stitch together a final movie from the individual sequences of images that were rendered in Maya. In addition to simply ‘stitching’ the sequences together, we will explore a few different compositing tasks as well. For example, there are benefits to rendering a single image/shot into multiple ‘render passes’ where different elements of the scene are separated out onto different layers and rendered independently with an alpha channel (i.e. transparency information). These passes need to be overlaid and blended together in ‘post’ (i.e. in a compositing package like After Effects). With this extra step you gain additional control over processes that would otherwise take longer to render ‘in camera’ (i.e. in your 3D package). We will composite together one of the sequences from your movie in order to add fake depth-of-field effects (i.e. blurring), a process that can be tricky and processor-intensive at render time in Maya.

Begin by opening the After Effects program – the standard layout for this application (v7Pro) contains a number of preset panels:

- the “**Project**” panel in the upper left: this is where you can import and organize the raw materials for your final composite
- the horizontal “**Timeline**” panel at the very bottom: it show layers on the left and the actual timeline (and any keyframes you will place on it) on the right.
- the “**Composition**” panel to the right of the “Project” panel is where you can preview the visuals you are working on.
- the “**Info**” “**Time Controls**” & “**Effects**” panels on the right. While the first 2 are somewhat intuitive, it will be easiest to find things in the “**Effects**” panel by using the text search box at the top of the panel (‘Contains: ...’).

Note that many of these panels may also be ‘tabbed’ - i.e. the **Info** panel also has an **Audio** panel tab, the **Project** panel sometimes has an **Effect Controls** tab as well – keep track of



these as they are usually where you will find things you thought were lost!

To avoid confusion, a word about nomenclature before we begin: an After Effects (AE) “**project**” can contain several compositions (or “**comps**”), and a comp is basically the unit of work in AE. “**Footage**” refers to any piece of raw starting material (could be a single image, a sequence of images, or an already assembled movie – 3D or live action). The basic workflow is as follows: you import footage elements that you need into your AE project and create comps that manipulate and edit these pieces of footage individually or in groups. Typically, you then create a “master comp” for your project that is made up of all the smaller individual comps... all this will become clearer as we start to composite and edit our footage elements.

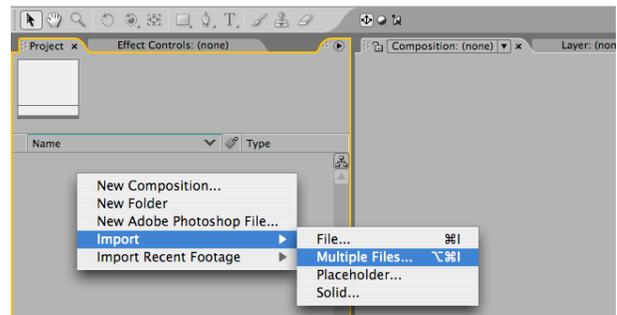
Let’s begin by importing all of our footage elements – in this case, they will mostly be Quicktime movies, but also 2 sets of IFF image sequences (with alpha channels). **Right-click in the empty Project panel** and select **Import > Multiple Files**. In the “footage” folder, select:

- hemo\_prot.mov
- hemo\_site.mov
- insideCap\_away.mov
- insideCap\_towards.mov
- outsideCap.mov
- outsideVillus\_bkgd.mov

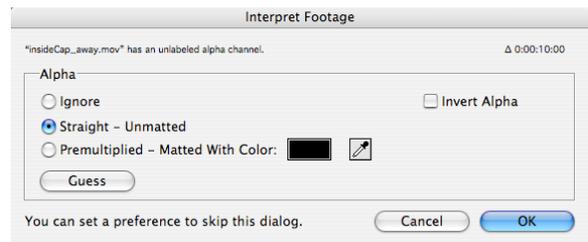
When you click Open, AE should ask you how to ‘interpret footage’ – select **Straight – Unmatted**.

*\*Note that in the original tutorial, some of these shots were kept as a sequence of IFFs - however, the size of the files was prohibitive for posting this tutorial online. Instead, for this tutorial we’ll importing a limited number of TGAs - select the first file in the sequence **outsideVillus\_main.170.TGA** and in the lower left corner of the import window, you’ll notice that it still says “Import As: Footage” but now it will also have “**TGA Sequence**” checked – this is good. Click Open (select Straight – Unmatted).*

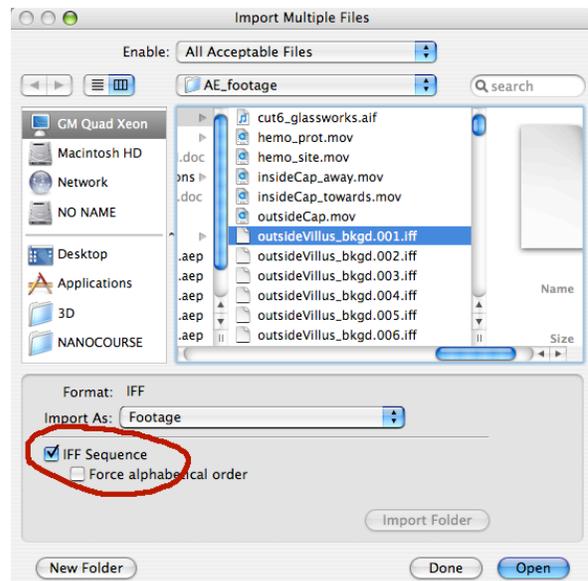
You can now click “Done” instead of “Open” in the Import window. Your Project panel is now populated with 6 Quicktime movies and one TGA sequence. Take a minute to become familiar with these pieces of footage – double-click any of the Quicktime movies to preview



Right-clicking inside the Project panel to import footage



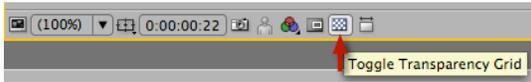
Interpret Footage options for Alpha channel/transparency



Import File dialog window detects an IFF sequence from Maya

them in a pop-up floating window. To preview the TGA sequence, double-clicking it - a "Footage" tab is created in the Composition panel to the right. Press the **spacebar** to start and stop **playback**.

You can view the alpha channel of TGA (or IFF) sequences by clicking the following small icon at the bottom of the panel:

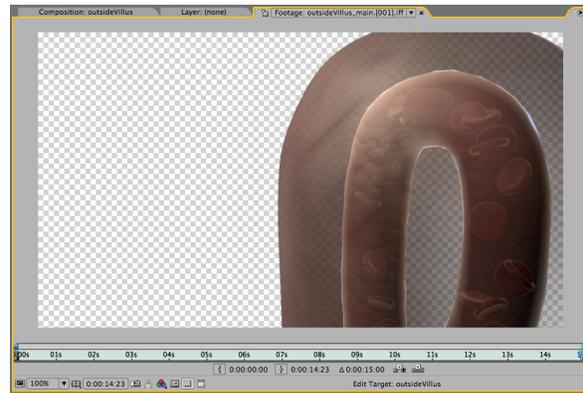


Also notice that when you select any piece of imported footage, the area at the top of the Project panel displays information about this file (i.e. pixel dimensions, time, frames per second, color depth...). If some of this information is not correct or you want to change it, you can "reinterpret footage" – let's do this on a piece of footage as an example. Notice that all imported footage files are 24fps except **hemo\_prot.mov** (which is **30fps**). Right-click on this file and select "**Interpret Footage -> Main.**" Change 30fps to 24fps and click OK. Make sure the TGA sequence is also at 24fps.

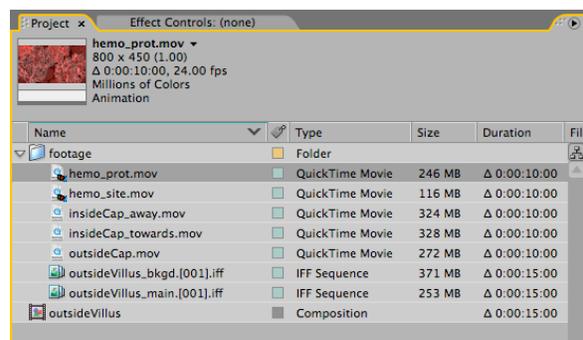
Right-click in your Project panel and select "**New Folder**" – call it '**footage.**' Drag all of the imported materials to it and save your project as '**tutorial1.**'

## Compositing Together Two Render Passes

We'll start with the first sequence (or shot) in your movie: it is a composite of the **outsideVillus\_bkgd.mov** and **outsideVillus\_main.170.TGA** sequences that show the outside of the villus to which we'll add a simple title. Since this first sequence is in fact a mini assembly of several footage elements and effects, it clearly deserves to be its own separate comp. To create a comp with dimensions that match that of your footage, **click-and-drag outsideVillus\_main.170.TGA** onto the **left side of the timeline panel** – notice that this automatically creates a comp in your project panel (the new icon has a little filmstrip). To rename a comp, select the layer and press the **Return** key – rename this comp "**outsideVillus.**" The timeline panel tab has also been renamed with your comp name. Now **click-and-drag** the **outsideVillus\_bkgd** movie from your Project panel down to the timeline – make sure it sits below the **outsideVillus\_main**



Inspecting the alpha channel (transparency information) of a footage element



Your populated Project panel – notice detailed information displayed at the top when you select a footage item

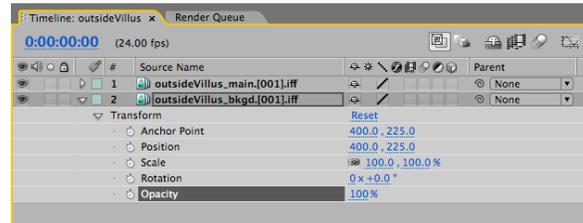
layer. Notice how the 2 image layers overlay in the composition preview window – the magic of transparency! Since these two image sequences were rendered from the very same camera in Maya, they will match perfectly when overlaid in AE.

## ‘Keying’ Layer Attributes

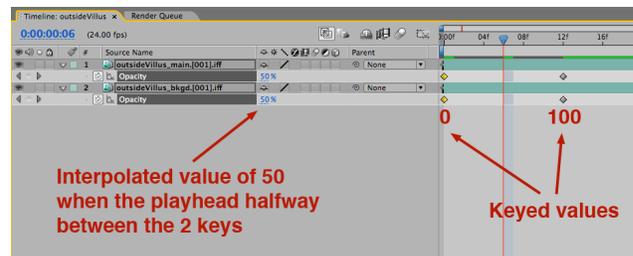
Even without applying any effects to a footage layer, there are several attributes that you can change over time (or ‘key’). To view these, expand the layer by clicking on the small right-pointing arrow in front of the layer number. Clicking on the stopwatch icon in front of any attribute in AE turns on keying – we will see how this works by first keying the opacity attribute of both the foreground and background layers in this comp. As a shortcut for expanding only the **opacity attribute**, **select both layers** and simply press ‘t’ on your keyboard (see the “AE Shortcuts” handout for other essential ones).

Make sure the playhead is all the way to the left (i.e. frame 0), and click on one of the opacity stopwatches (since both layers should still be selected, this will activate the stopwatch for both layers). A small diamond has appeared at the very left of the timeline – this is a KEY. Now **reduce the opacity value to 0%**. Go to a frame of your choice in the timeline, and **increase the opacity to 100%** - notice how changing the value *automatically* created a keyframe where the playhead was...

This is a major difference between Maya and AE: in AE, once you turn on keying/click the stopwatch, any move you make in the timeline followed by a change in the attribute’s value will *automatically* key that value on that frame (it’s basically “auto-keying”). In Maya, when you go to a particular frame in the timeline, you must change your attribute’s value, and *then* right-click on the attribute and select “Key Selected.” This difference will take a little getting used to! The one thing that is not different between the 2 programs, is that the attribute’s values will be interpolated between any 2 keys you have set. In other words, if you have a value of 0 on frame 0 and a value of 100 on frame 30, the program automatically generates all intermediate values (i.e. you’ll get a value of 50 at frame 15). Observe the opacity values change as you scrub the playhead in the timeline.



Expanding a layer in your comp reveals keyable attributes



Keying the opacity attribute on the timeline

## Adding Effects to Layers

Next we will add a blur to the background layer – this was, after all, the whole purpose of breaking this shot into foreground & background render passes in Maya.

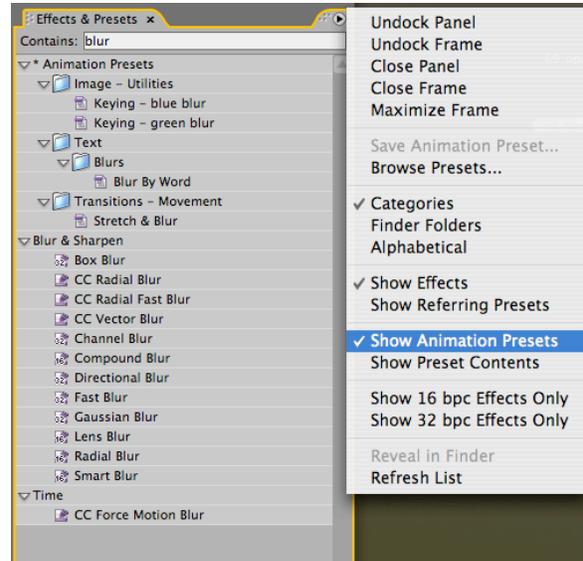
Go to the Effects Panel and type the word **'blur'** in the text box. If the list that appears is too busy, you can always click on the little arrow at the very top right, and toggle off 'Show Animation Presets.'

**Click-and-drag** the **Gaussian Blur** effect (under "Blur & Sharpen") and **drop it** onto the **outsideVillus\_bkgd** layer in your timeline.

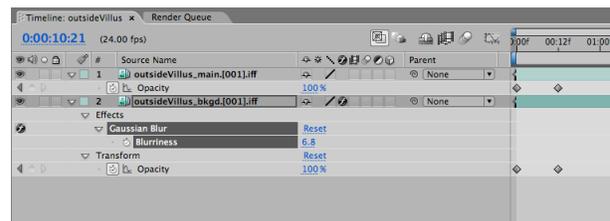
This will automatically switch the tab of the upper left panel from **Projects** to **Effect Controls**. This is where you can gain fine control over the behavior of any effects you apply (as with anything in AE, any 'keyable' attribute has a stopwatch in front of it). Also notice that if you now expand **outsideVillus\_bkgd** in your timeline, there is an additional Effects layer (in addition to the existing Transform layer). You can key attributes from there or the Effect Control panel – same thing.

For this shot, we might want to increase blur on the background layer when the camera reaches the tip of the villi (and there is a nice perspective). As before, put the playhead at **time/frame 0** and click the **'Blurriness'** stopwatch – you can keep the value to **0** on this frame. Now scrub ahead and **increase the value** to your liking. Two new diamonds should have appeared in the timeline – scrub to preview your blur effect.

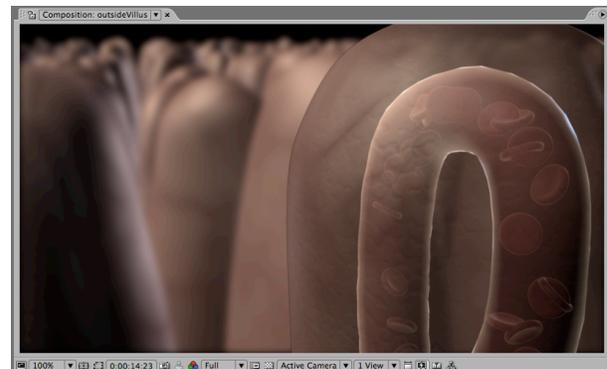
Finally, we will add some text to this comp. In the upper left of the AE interface, notice the **Toolbar** – select the **Text** icon, click on the **Composition Preview** window, and **type your title**. In order to change the appearance of text, we will change the Workspace presets (i.e. the layout of panels in the AE interface). Use the **Workspace drop-down** in the upper right of the interface – select **Text**. This now brings a **'Character'** panel to the right with all necessary settings. A new (text) layer has also been created in your timeline (it's orange instead of green for footage) – expand it, and explore its keyable attributes (for this tutorial, let's just key opacity).



The Effects panel with its 'view options' expanded



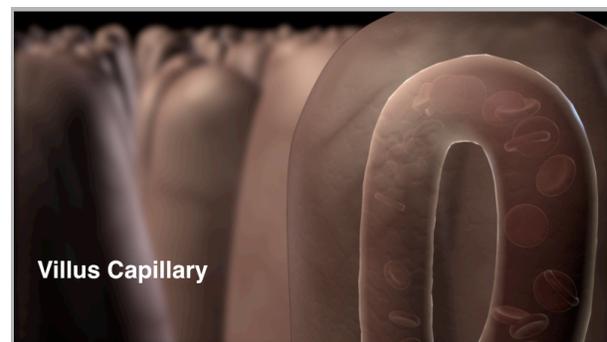
In addition to the Transform attributes, an Effects/Gaussian Blur subfolder now appears when the layer is expanded



A Gaussian Blur applied to the background layer



AE toolbar



## Creating Your Master Comp

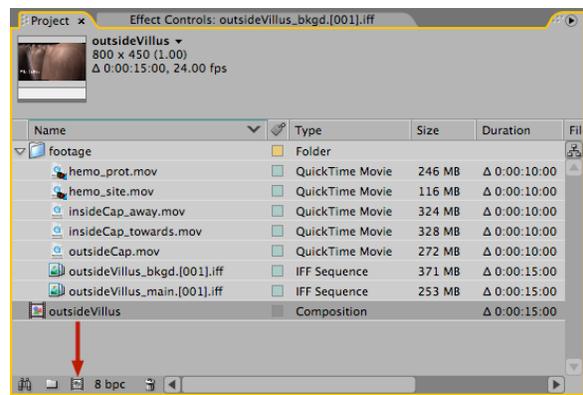
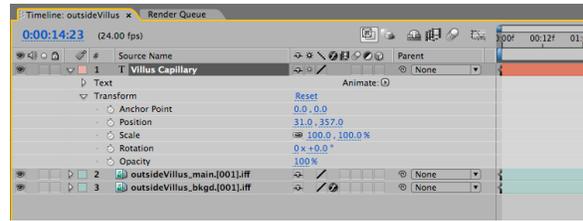
Having completed the first 'shot' (which we created as a 'sub-comp' entitled 'outsideVillus') we can now create the master comp that will hold all shots for the final movie. To create a new comp with matching settings to an existing one, simply **drag** the **outsideVillus** comp from your Project panel, to the small **filmstrip icon** at the bottom of that panel.

The new comp appears in the Project panel – **select** it, hit **Return**, and **rename** it '**MASTER\_COMP**.' Notice the timeline is now loaded with this new comp, and has your other comp 'outsideVillus' as a layer in it – it is now a "nested" comp. This new MASTER\_COMP not only inherited the dimensions and frame rate of your other comp, but also its total playing time. Since we'll be adding a lot of other footage, we'll lengthen the comp time by going to the **Composition -> Composition Settings** drop-down menu. At the very bottom of the window that appears, enter a total time of **~1 minute**. Click OK. To view the complete range of time in your comp, go to the bottom of the timeline panel and drag the zoom indicator all the way to the left – you'll notice that your **outsideVillus** layer now only occupies a small part of the total timeline.

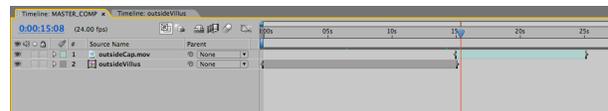
We'll now drag all the remaining footage elements into the master comp (they're all Quicktime movies). Let's think about how our layers need to be ordered in the stack (i.e. one typically places the next shot above the previous one), as well as the chronological ordering of the shots in the final movie... Start with the next shot called **outsideCap** – drag it directly to the right side of the timeline panel and drop it just about where the **outsideVillus** comp ends (and above it). When you release, the footage now inhabits a new layer on the left and its playback "IN point" is roughly at the "OUT point" of the comp below it. You can adjust its position by click-dragging the horizontal bar representing that layer in the timeline.

Repeat this process with all remaining footage - in the end, you should have the stacked and chronological order of layers as seen in the figure to the right.

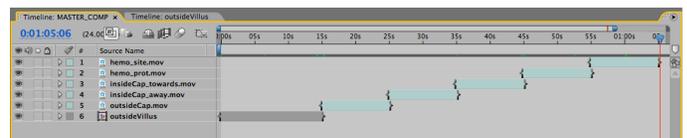
Now we'll add a transition between shots just to go over the process (it's the same as adding any other effect). Let's add a fade between



You can create a new comp with identical settings by dragging the existing comp onto the comp icon at the bottom



Adding a piece of footage to your MASTER\_COMP and placing it correctly in the timeline



All footage items dropped into your MASTER\_COMP

insideCap\_away and insideCap\_towards: in the Effects panel, **type 'fade'** and select **Fade In Over Layer Below** under **Behaviors** (make sure that your view options are back to **"Show Animation Presets"** for that panel or you will not see it)! Drag this effect onto the insideCap\_towards layer – you'll need to **overlap the two layers** a bit in order to see the effect (as a result you'll also need to move left your last two footage elements to avoid any gaps in playback).

## Adding Audio

You can import audio just like any other piece of footage: **right-click -> Import -> File** (or just **double-click!**) in the **Project panel** and find your audio (.aif) file. Drag this into your footage folder, and then drag it to the bottom of your MASTER\_COMP layer stack in the Timeline panel. You can actually view the waveform for the file if you expand the layer in the timeline. We'll now fade in the music at the beginning of the movie and fade it out at the end. We will **key** the **Audio Levels** attribute – levels should be:

**-48 dB at time 0**

**0 dB** (i.e. "unadjusted") **at ~3 seconds**

**0 dB at ~ 50 seconds** (for this one, click the greyed-out diamond at the very very left of the layer!)

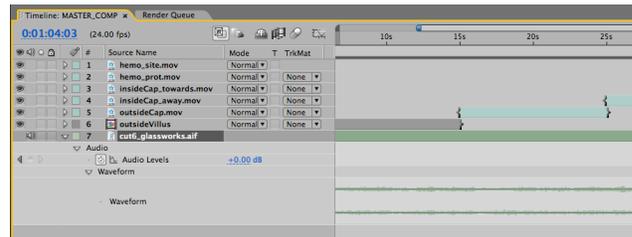
**-48 dB at the last frame**

(the exact times will depend on how you overlaid your shots in the timeline).

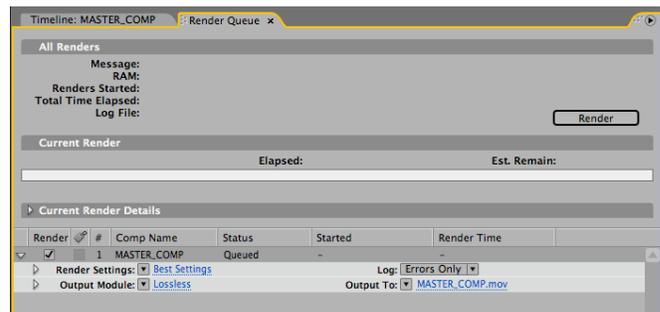
## Queuing and Rendering

When you have finished making adjustments to your MASTER\_COMP (and any nested comps), simply select the comp in the Project panel, and go to the **Composition -> Add to Render Queue** drop-down menu. This will open the Render Queue panel tab (overlays the Timeline panel) – clicking on the blue lettering to open various export settings windows (turn on the audio export option!) as well as a choice to name your file (under "Output To").

In the upper right of the Render Queue panel, click on **'Render'** – you're done 😊



Expanding the audio layer in your master comp displays the audio waveform in the timeline – keying the Audio Levels attribute is reflected in the amplitude of the waveform



Render Queue