

PFClean 2.1 Tutorial

Grain Tools



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Introduction

In this tutorial, we'll show how to sample grain from an image and use the preset management tools to add and remove grain from a clip. We will also show how masks can be created to limit the influence of different effects.

Download Footage

This tutorial requires you to download and uncompress the following footage to an easily accessible storage location: <http://www.thepixelfarm.co.uk/Footage/GrainTutorialFootage.zip>

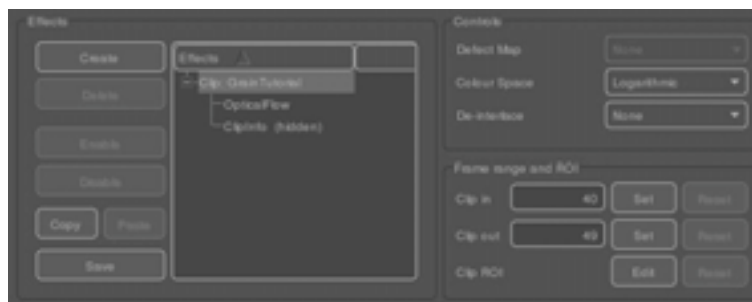
Setting up footage

Load the "####.dpx" clip by dragging the folder into the media bins from the file browser.

Loading a clip into the 'Edit' tool

Drag the clip into the media bins, highlight the clip by clicking on it with the left mouse button and press the "Select" button to select the clip for editing (or shift-double-click on the clip in the media bins with the left button).

This clip is also in log space, so whilst in the clip panel, change the "Colour Space" option to "Logarithmic". This will help PFClean to improve the accuracy of operations applied to the clip.



Sample grain from the image

In this tutorial, we are going to reduce the amount of grain in the background of this shot, and increase the grain in the foreground.

Before we do this, we'll use the grain management tools to take a sample of the current grain in the image so it can be removed accurately. Click the "Grain" button to switch to the grain management toolset.



To sample grain, click the "Sample" button in the Analysis box and draw a rectangle in the image by clicking and dragging with the left mouse button. Try to place the rectangle somewhere that is relatively flat with constant colour, as shown in the image below.



When you release the left mouse button, you will see that the red, green and blue parameters in the "Analysis" box have changed to reflect the size and standard deviation of the grain in that part of the image. You can sample from multiple parts of the image at the same time by holding the shift key down when drawing a sample rectangle. Once you are done, press the "Sample" button again to switch it off.

To see the effect of these parameters, click the "Preview" button at the bottom-right of the toolset to switch on the preview window. This window is split horizontally into two sections: the left is the original colour, and the right shows the result of removing grain with the "Current Degrain" parameters followed by adding new grain with the "Current Regrain" parameters. You can move the blue split line left and right by clicking and dragging with the left mouse button.



You can preview grain over part of the image by pressing the "Grab" button. Move the mouse over the image and click with the left mouse button to grab part of the image. After you have picked an area, switch the "Grab" button off by clicking it again.



Now, dragging the blue split line in the preview window will show before/after the current degrain and regrain has been applied. Notice that the current degrain and regrain parameters are still at their default values - we haven't copied them from the "Analysis" boxes yet. To do this, press the "Set Degrain" and "Set Regrain" buttons. You will see the parameters change, as well as the image in the preview window.

As well as previewing the result of the current degrain and regrain together, you can also see a preview of the degrain on its own. To do this, click and drag the blue split line left with the Shift key held. You will see the line separate into red and green lines. Now, the effect of the current degrain parameters on their own are shown in the middle. You can move the preview window again if you wish by pressing "Grab" and clicking in the viewer window. Dragging the red and green lines back together will switch back to the original blue split line.



The grain preview window should be used to verify that the current degrain and regrain parameters can accurately reproduce both a grain-free clip (in the middle of the preview), and then re-apply grain correctly, so the final result (on the right) looks the same as the original (on the left).

You can change the current degrain and regrain parameters by hand by editing the values in the boxes. In this case, we will increase the grain that we add back into the clip, so click and drag with the left mouse button in one of the "Std Dev" values in the "Current Regrain" box and change increase them to 10.

Once you are happy with the result, click the "Store" button in the Presets box to store these grain parameters as a new preset called "Untitled". Grain presets will be available each time you start the application, and are stored as XML files in the "presets" folder that is in the same place as the user preferences (see the PFClean reference documentation).

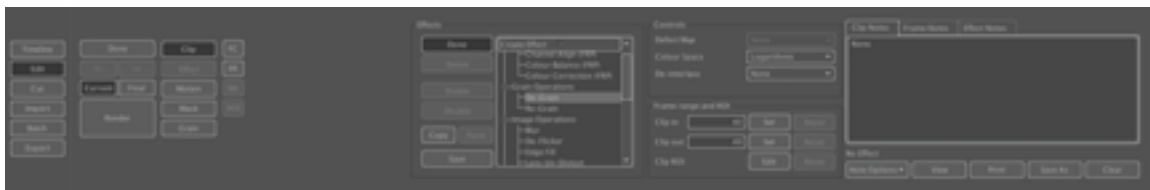
To name the preset something sensible, click on it in the preset list to select it, then click again to rename (we've renamed it to "GrainTutorial" in the image below)



Removing grain from the clip

We'll now use a "Degrain" effect to remove grain from the clip using the preset we've just built.

Go back to the clip panel by clicking "Clip", then click "Create" to display the list of available effects. Scroll down to find "Degrain" and click it with the left button to create a degrain effect. The "Create" button has changed labels to "Done", so click "Done" to stop effect creation and switch to the degrain toolset.



Click on the "Preset" menu box to select the grain preset we've just created, and you will see the red, green and blue parameters update accordingly. The viewer window change to show the de-grained clip.

To improve the quality of the degrain, we can switch "Temporal" processing on. This will analyse motion in the clip and use this temporal information to help remove grain. Press the "Temporal" button to start the analysis, and after a few seconds it will finish.



You can also use the A/B split to examine the image before and after grain removal. To do this, press the "A/B" button underneath the viewer. With the Shift key held, click and drag the split line with the middle mouse button. Click the button again to switch the A/B split off when you are finished.

To speed up the processing for the rest of this tutorial, let's render the clip after grain removal. Click the "Render" button on the left and wait for it to finish. When you scrub through the clip now, you should see the grainless clip.



Adding grain to the foreground

To add grain back into the clip, we will create a "Regrain" effect. In a similar manner to the degrain effect above, go back to the Clip panel and repeat the steps to create a new effect, but this time click "Regrain". Notice that the regrain effect is being applied after the degrain, as you can see by looking at the information at the bottom-left of the viewer window.



Click on the "Preset" menu box to select the grain preset we've just created, and you will see the red, green and blue parameters update accordingly. The viewer window change to show the new grain applied back to the clip.

Use the A/B split to examine the image again before and after regrain. Press the "A/B" button underneath the viewer, but this time, press the Up cursor arrow on the keyboard to move the "B" view to the Degrain effect. Click the button again to switch the A/B split off when you are finished.

Adding a mask

In this tutorial, we are going to ignore the defect map and detect dirt pixels directly from the RGB image data, Next, we will create a mask to limit the Regrain effect to the foreground. Click on the "Mask" button to switch to the mask tools. We will draw a roto spline around the bottles on the right of the image, so click the "Roto" button to switch into roto mode.

Each time you click in the viewer window with the left mouse button, a new point will be added to the roto spline. If you hold the mouse button down after clicking, you can drag out Bezier spline control handles to further refine the mask shape. To finish the mask, close the curve by clicking again on the start point.



After the mask is created, you will see it highlighted in the viewer window. When you create a mask, it is automatically activated in the current effect, so you will also notice that the Regrain effect has been restricted to inside the mask.

In this case, we'd like a nice soft mask edge so the boundary isn't so sharp. Click in the "Thickness" box, type "20" and press return. This will place an outer mask boundary 20 pixels away from the inner boundary, and the area inbetween will vary smoothly between fully masked and full un-masked.



You can adjust the mask vertices by dragging their controls points with the left mouse button. When the "Edit Inner" button is on, you can adjust the inner mask boundary. When the "Edit Outer" button is on, you can also adjust the outer mask boundary.

Masks influence the current effect by writing themselves into the clip's alpha channel. To see this, press the Alpha button in the viewer RGBA controls. You can activate or deactivate a mask in any effect by clicking the "Deactivate" and "Activate" buttons.



To switch off the mask overlay, Click "Show Masks" to turn the button off, then switch back to the Regrain tools by pressing the "Effect" button again. To see the final result of the regrain, hit the "Render" button again to render the Regrain effect, or press the Play button and wait for the cache to fill up.