

Getting Started With PFTTrack 3.5

The aim of this tutorial is to give you a basic understanding of the automatic tracking process used to produce match move data. It should be read in conjunction with the Quick Start guide that is installed with the software.

Tutorial Overview

In this tutorial you will learn how to set up a basic project, load in footage, track and calibrate that footage and export the results to a 3D system.

Tutorial for:

PFTTrack 3.5

Menu Hot Keys used:

Track and Solve – Ctrl F6 or Apple F6

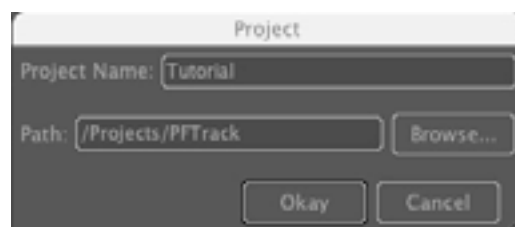
Footage Required:

The 'Lift_View' footage

Step 1 – Starting a new Project

Once PFTTrack has started up, you'll be faced with a blank, grey canvas, with the menu toolbar along the top (most of these icons are currently greyed out), and a panel down the left-hand side, containing the Project Overview at the top, and the Shot Overview underneath. If you haven't run PFTTrack before, these will both be empty.

Start a new project by selecting File>New Project. Name it 'Tutorial' and choose a suitable location to save the project then click 'Okay'.



The Project Overview is now called 'Tutorial' and contains a single 'Untitled Shot'.



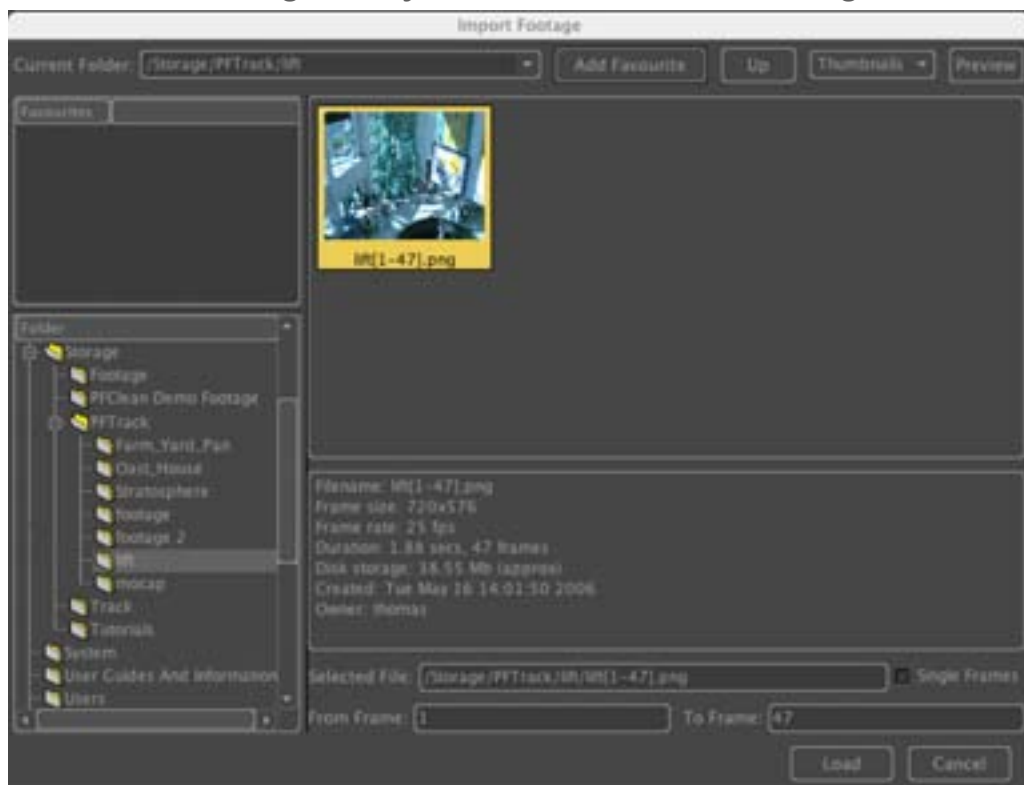
In PFTrack each project can contain several shots at once, but you'll just be using one. Right click on the 'Untitled Shot' label and select 'Rename' to change its name to Auto Lift.



Step 2 – Loading and modifying footage

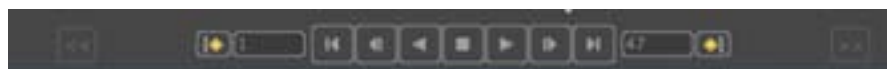


You now need to import some footage to track. Click on the 'Import Footage' icon (icons display their function when you roll the cursor over them). Navigate to the Lift footage folder you downloaded, select the footage and click 'Load'.



The footage is then checked and the first frame is displayed. The sequence also appears beneath the Footage icon in the Shot Overview panel.

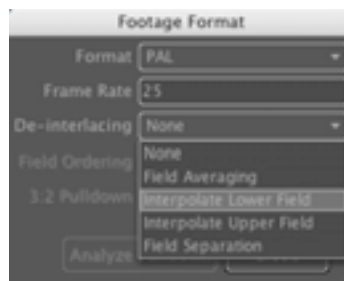
You can play and shuttle through the footage using the transport controls at the bottom of the screen.



Depending on the type and quality of the footage you're using, you might want to change the interlace options. To do this, right-click on the footage name in the Shot Overview panel and select 'Edit Format', then click on the De-Interlace options. Select



'Interpolate Lower Field' for the Auto Lift footage. Leave the other options as they are



and click on 'Close'. When you play the footage back you can now see that the interlacing has been removed.

Note: Setting a Cache in the Performance Tab of the Application Preferences will also greatly improve playback speed.

Step 3 – Auto Tracking and Calibration

To start the tracking calculations, select Tracking>Track and Solve, or hit Ctrl F6 (or Apple F6 on a Mac). PFTrack will automatically detect and track a number of points, and then use this information to calibrate the lens on the camera. Depending on the speed of your machine, you can either go make a coffee or just sit and watch the graphs glide past – don't worry about these for the time being, they are explained in the manual.



Note: If you have a multi-processor machine, make sure the number of threads is set accordingly in the Application Preferences.

Once the calculations are complete, the screen reverts back to the first frame. It is covered in green, red, and white dots, and a coordinate axis. The green dots show where the 3D features match their feature track well, while the red ones show where they don't. White dots show where a feature wasn't tracked into that frame.



Step 4 – Viewing your track in the 3D Viewer



To see how well your scene has been tracked and calibrated open the 3D Viewer by clicking on the 'New Viewer' icon. Your screen should be split in two windows, with the 3D Viewer on the right.

Note: You can switch from vertical split to horizontal split and vice versa by clicking the 'Tile Window Layout' button.



You can rotate, zoom and pan around using the left, middle and right mouse buttons respectively.

Note: If you don't have a three-button mouse, you can emulate the Left, Middle and Right mouse buttons using the keyboard modifiers A, S and D – or configure your own in the Application Preferences.

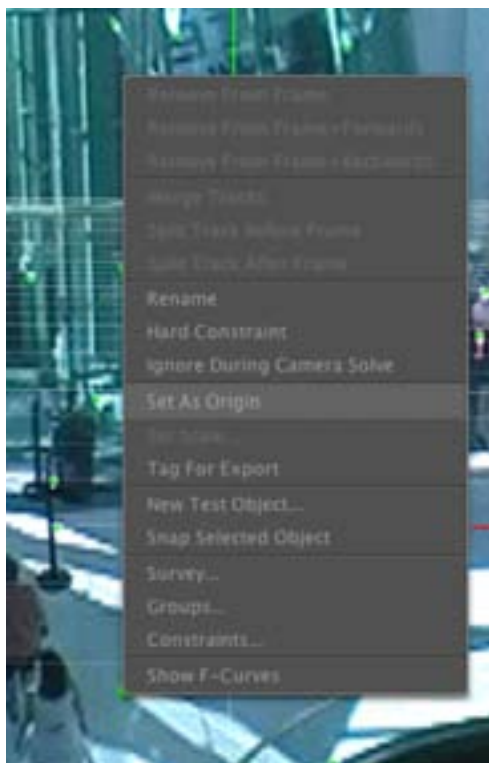
You'll notice that a ground (X, Z) plane runs through the scene, locating the camera more or less at ground level. We need to choose a centre of origin to place this where it will be of most use as a reference when we export the data to a 3D package.

Step 5 – Setting a point as the origin

In order for exported data to relate to real world coordinates we need to set up a ground plane that corresponds to a relative one in the footage. When exporting to a 3D system, for example, it is good to know which way is up. To do this, you need to find a suitable location for the origin of the shot. This can be anywhere in the scene, but for this shot it makes sense to put it on the floor of the building. Go to the first frame and locate the green point in the middle of the floor.



When you hold the cursor over the dot it will expand slightly to show it is highlighted – now right click and select 'Set as Origin'. The ground plane immediately snaps to this



point, but is still incorrectly oriented. The cursor will have automatically switched to 'Scene Orientation Mode' – now when you click and drag, you can rotate the ground plane around to position it. Over in the 3D Viewer, the ground plane remains static, but the camera and track points move accordingly.

Lining up the grid this way can be quite tricky, so you can constrain its axis of movement. By holding the X key in conjunction with the left mouse button, you constrain movement in the X axis. Likewise, you can use the Y key for the Y axis, and the Z key for the Z axis.

While in Scene Orientation Mode, the right mouse button is used to move the ground plane, while the middle mouse button is used to scale it. PFTrack doesn't use any specific scale, but you can use the squares on the grid to represent a scale that is convenient for your workflow.

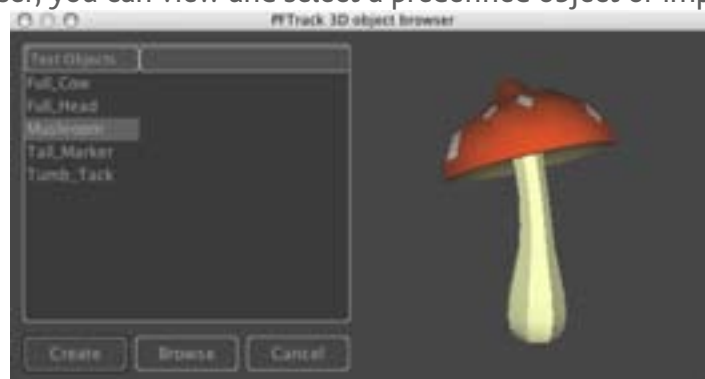
Note: If the mouse doesn't react the way you expect it to, check if you are in the right cursor mode. In 'Navigation Mode' you use the mouse to zoom, scroll and rotate the view, whereas in 'Scene Orientation Mode' you rotate, scale and move the coordinate system of the scene. You can switch modes by clicking the respective icons.

Hint: A good way to set the ground plane in this example is to ensure that grid lines are parallel to the wall on the left.

Step 6 – Using a test object

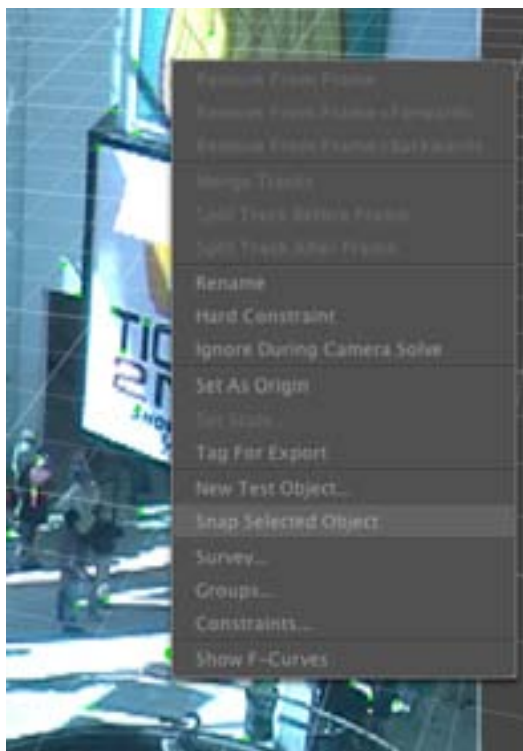


To check how well the footage was tracked and the ground plane was set, you can import a test object and place it into the scene. To import the object, click on the 'New Test Object' icon to open the 'PFTrack 3D object browser'. In the object browser, you can view and select a predefined object or import your own



Wavefront .obj files. Select an object you like and click 'Create' to place the object into the scene. The new object will be listed in the 'Test Objects' section of the Shot Overview Panel and shown in the scene. When it is selected, you can translate, rotate and scale the object by clicking the 'T', 'R', and 'S' buttons at the bottom of the viewport respectively.





It is a good idea to attach the object to one of the green dots you can find on the floor of the building. To do this, move the mouse over a dot of your choice. When the dot is highlighted, right-click and select "Snap Selected Object". When you play back the footage, the object should fit naturally in the scene.

Step 7 – Exporting camera data

This last step is to export the data we created. You can export the 2D tracking data, the 3D camera data, or you can export data for The Pixel Farm plug-ins. Today we want to export the 3D data. You can find the exports in the lower half of the Shot Overview Panel. Right-click on the entry that says 'Camera Exports' and select 'New'. The export directory dialogue



provides a pull-down list of supported applications. Leave the features set to 'All', set a destination for the file, and click 'Okay'. You have just exported your first camera data from PFTrack.



Now would be a good time to save the project. Since it has already been created and named, all you have to do is click on the 'Save Project' icon.

Load the scene file into your 3D app to see how well PFTrack has done!