



Match Move

Digital Visual Effects, Spring 2014

Winble 2014/05/20

WorkFlow

- Input
 - Video



- CGI Animation



WorkFlow

- Output
 - Composite Video



WorkFlow



Video



Image sequence

Calibration



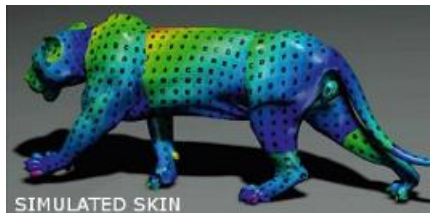
Voodoo



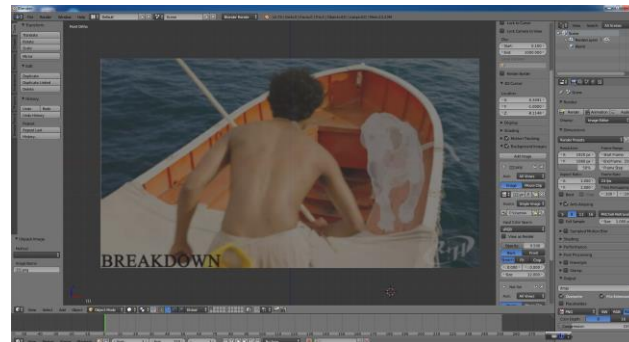
MatchMove Software

Blender

Compositing



3D Model



Output Video

Setting

- **Blender**

- Version: 2.70a
- Operating System
 - Windows XP/Vista/ 7 / 8 32/64 bits, Linux, Mac OS X
- Web Site: <http://www.blender.org/>

- **Voodoo**

- Version: 1.2.0 beta
- Operating System
 - Windows 95/98/NT/2000/Me/XP/Vista/7, Linux
- Web Site: <http://www.digilab.uni-hannover.de/>

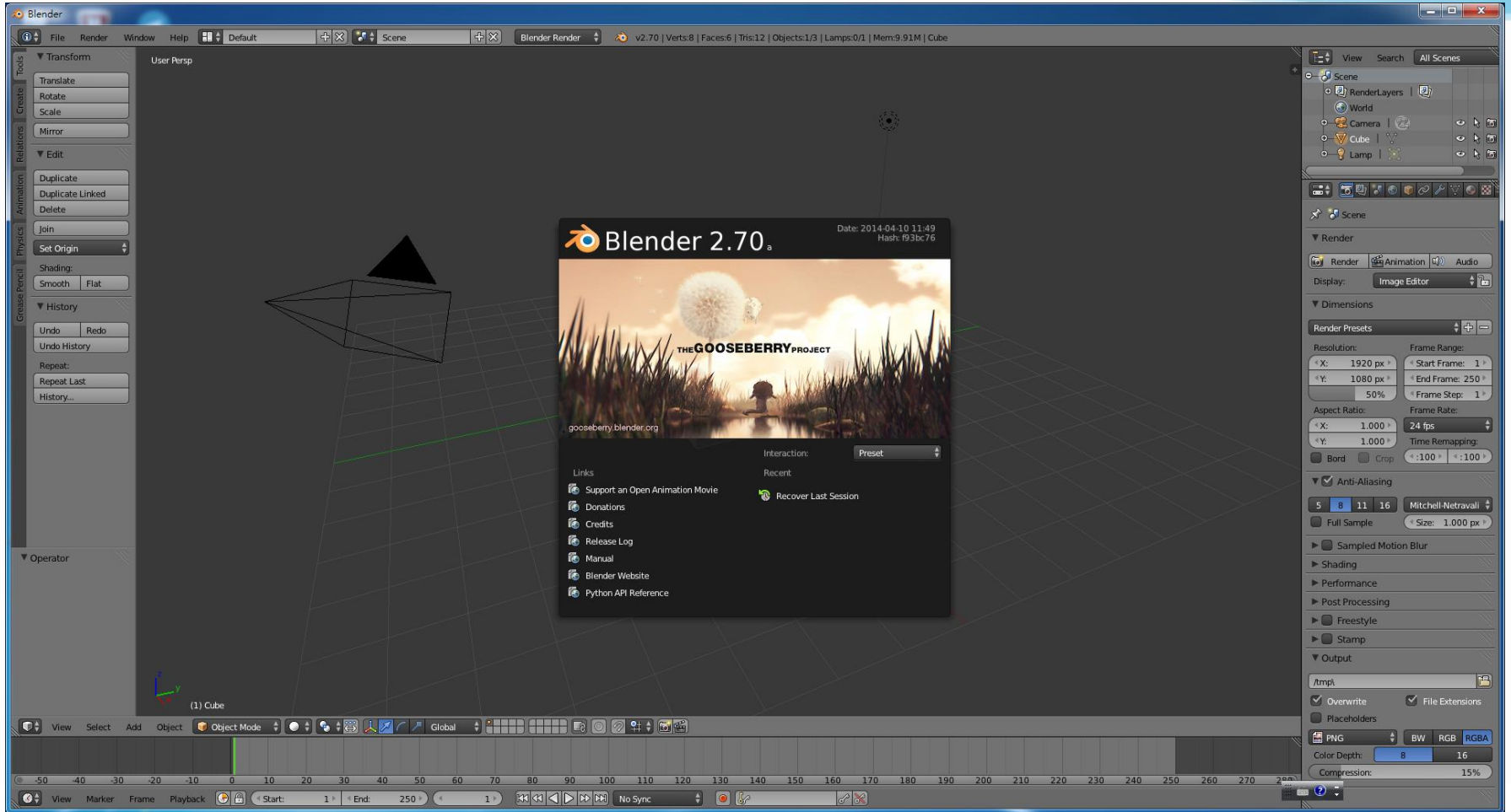
- **Other Options**

- Free: Blender + ICARUS
- Pay: boujou + 3D Max, boujou + Maya, ...

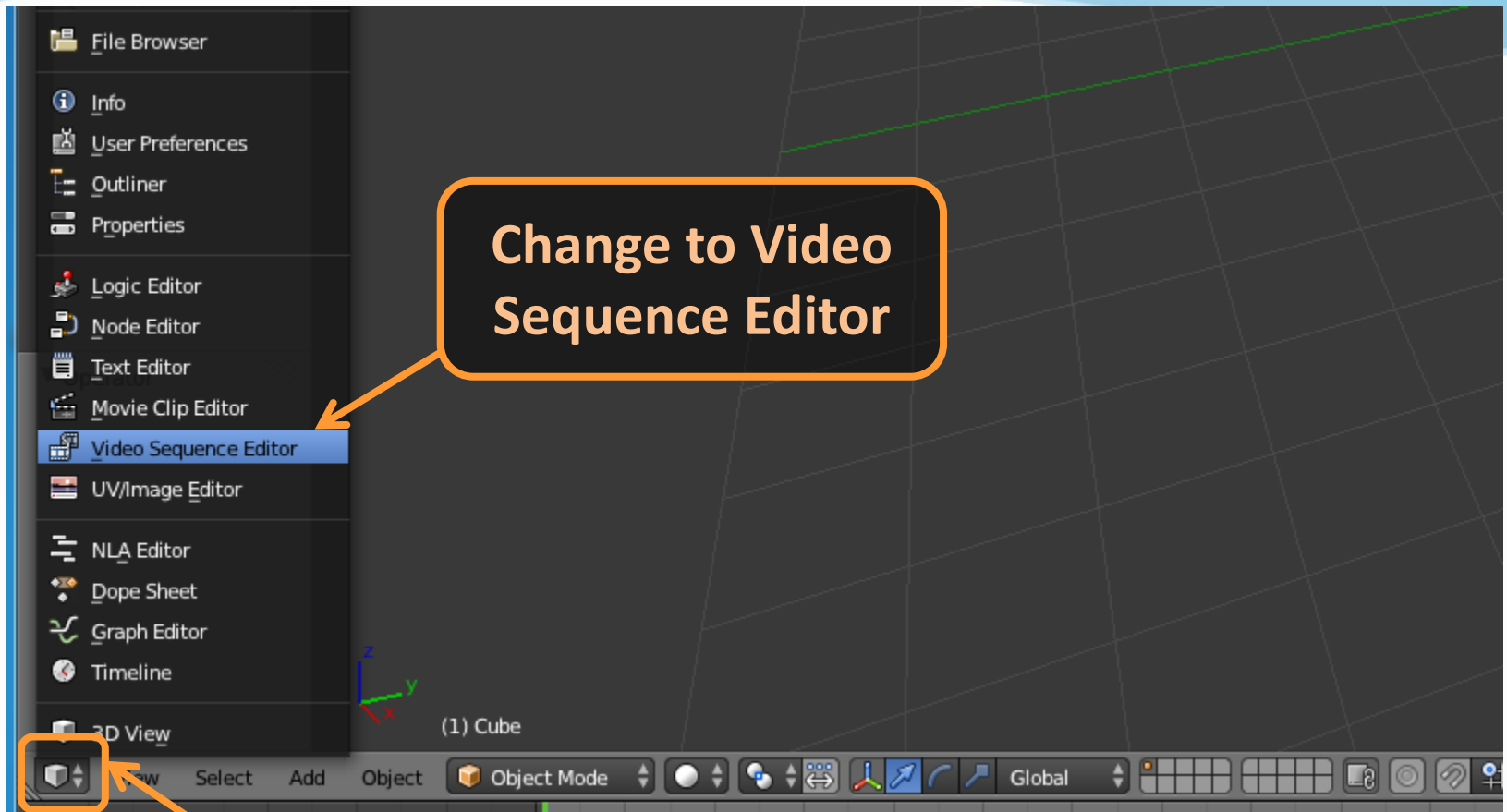
Recipe: Get Image Sequence

0. Open Blender
1. Add Video File
 - Change Window Type to **Video Sequence Editor**
 - Select **Add → Movie**
2. Render Images
 - Choose **Render Mode**
 - Frame
 - Set frame size and resolution
 - Choose output file type (**Targa**)
 - Time interval → Select start and end of the sequence
 - Choose output directory
3. Click **Animation** button

Step 0 : Blender Interface

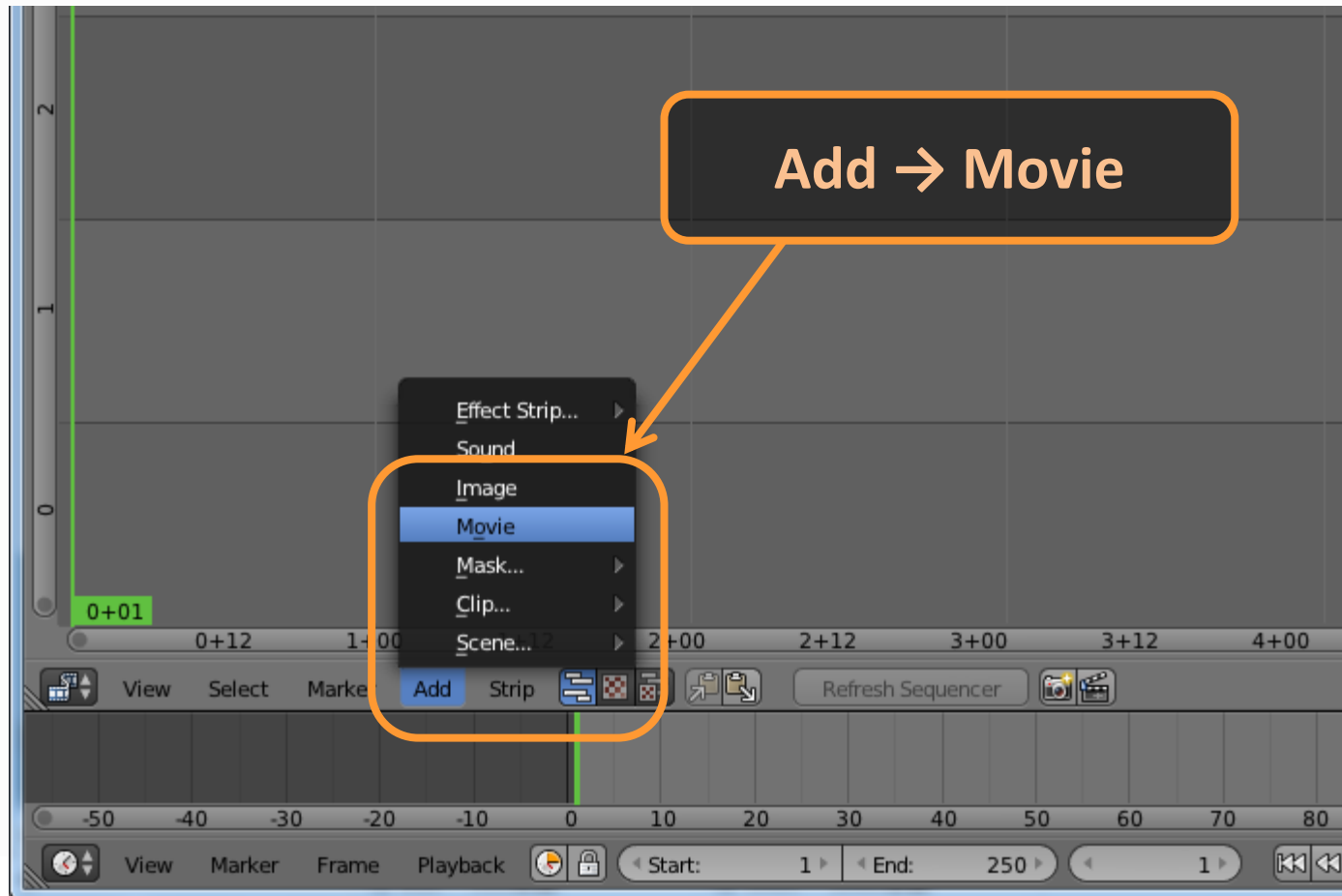


Step 1 : Add Video File

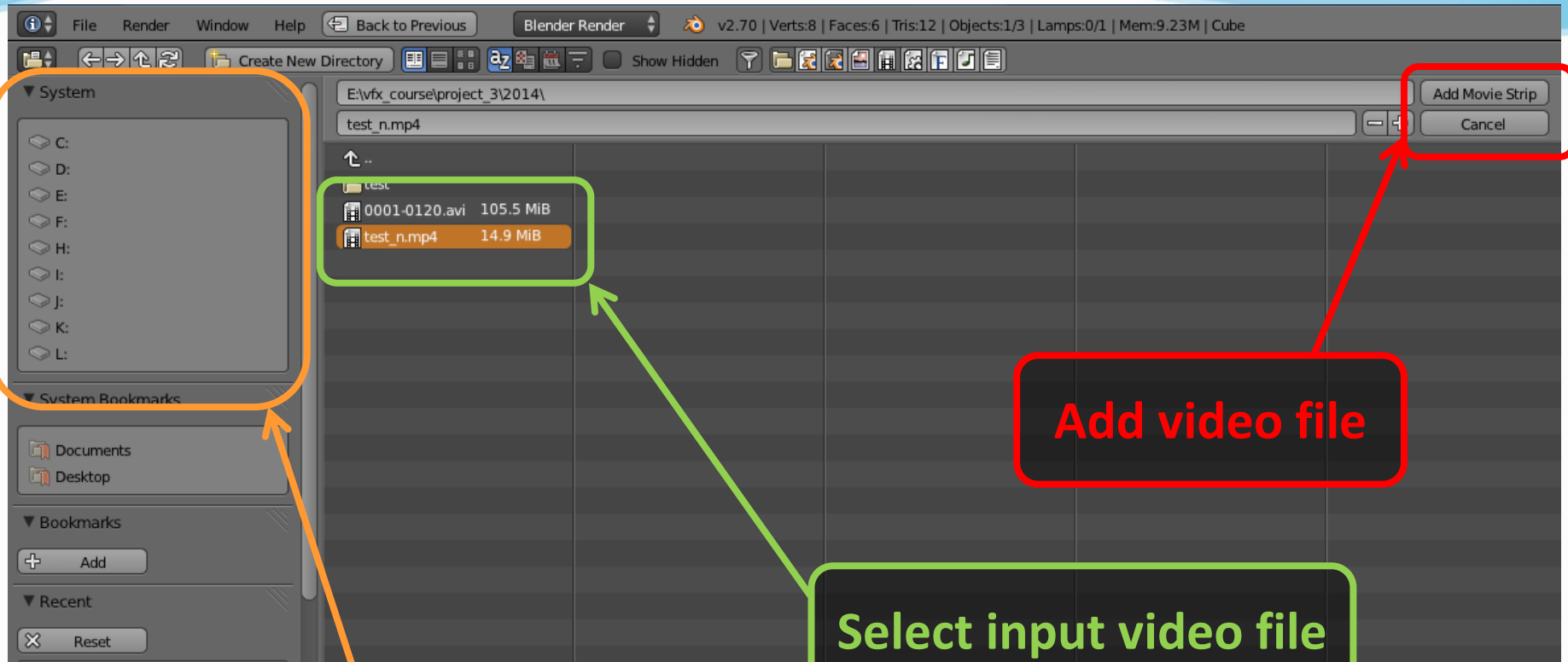


Click here to change window type

Step 2-1 : Add Video File



Step 2-2 : Add Video File



Select file directory

Select input video file

Add video file

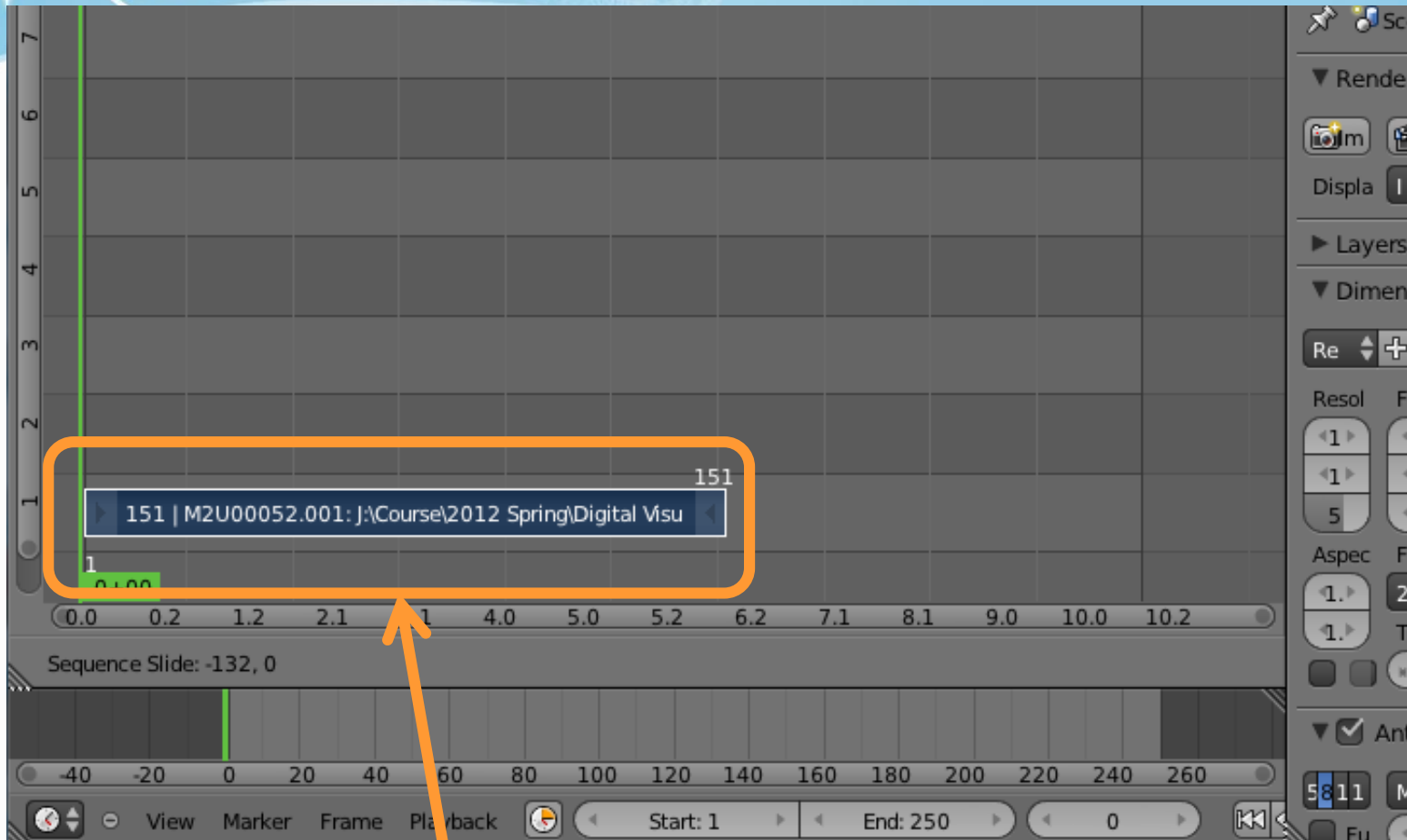
Step 2-3 : Add Video File

The image shows the Blender 2.79 Sequencer Editor interface. A video strip labeled '121 | M2U00052.MPG: J...' is selected. A red box highlights the 'Erase Strips' button in the context menu. A red arrow points from the text 'Click "Delete" button' to this button. A larger orange box contains the text: 'This is the sound track. Since we only need images for feature tracking, you can choose to remove it here, and add it back at the video editing stage!'. The interface includes a timeline at the bottom with markers and a 'Refresh Sequencer' button.

This is the sound track. Since we only need images for feature tracking, you can choose to remove it here, and add it back at the video editing stage!

Click "Delete" button

Step 2-4 : Add video file



Right-click to Drag the strip to the "1st Frame" in Layer 1

Step 2-4 : Add video file

The image shows the Blender 2.70 interface with several annotations. A red box labeled "Produce!" points to the "Animation" button in the Render properties panel. A green box labeled "Set Frame size, Resolution, Frame Range & Frame rate" points to the Resolution and Frame Range settings. A yellow box labeled "Choose output file type 'Targa'" points to the "Targa" option in the File Format menu. A blue box labeled "Set output directory" points to the File Format menu. The timeline shows two tracks: "Input Audio" and "Input video".

Produce!

Set Frame size, Resolution, Frame Range & Frame rate

Choose output file type "Targa"

Set output directory

test_n.mp4: E:\vfx_course\project_3\2014\test_n.mp4 | 1450 **Input Audio**

test_n.001: E:\vfx_course\project_3\2014\test_n.mp4 | 1449 **Input video**

File Format

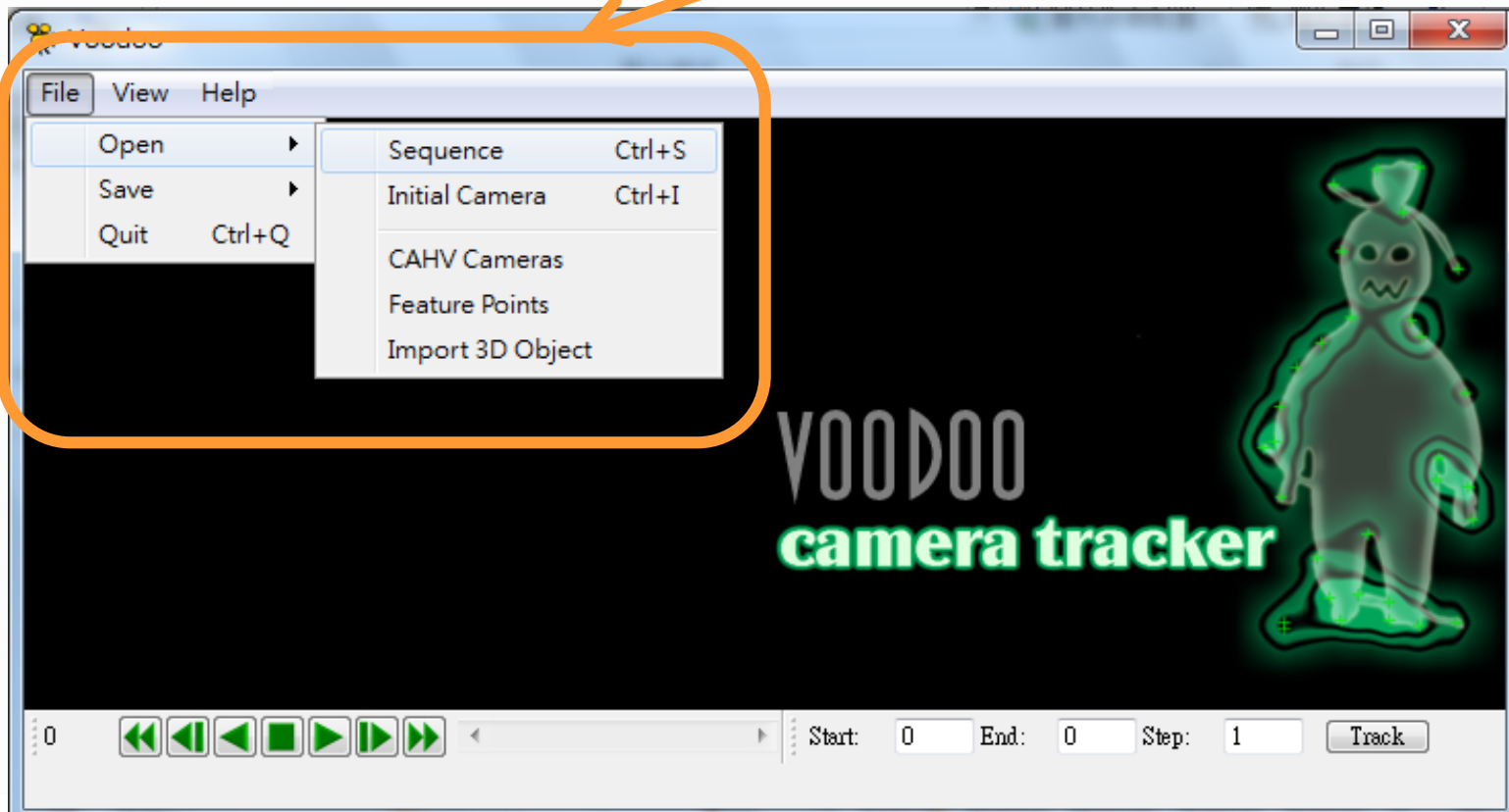
Image	Movie
BMP	Cineon
Iris	DPX
PNG	OpenEXR MultiLayer
JPEG	OpenEXR
JPEG 2000	Radiance HDR
Targa	TIFF
Targa Raw	
	AVI JPEG
	AVI Raw
	Frame Server
	H.264
	MPEG 2
	Ogg Theora
	Xvid

Recipe: Calibration

0. Open Voodoo
1. Open Image Sequence
 - Select **File** → **Open** → **Sequence**
 - Select the first frame
 - Select Move Type “**Free Move**”
2. Track → Click **Track** button
3. Export Python Script
 - Select **File** → **Save** → **Blender Python Script**
 - Save .py file
 - Choose File type “Blender 2.5x and higher (*.py)”

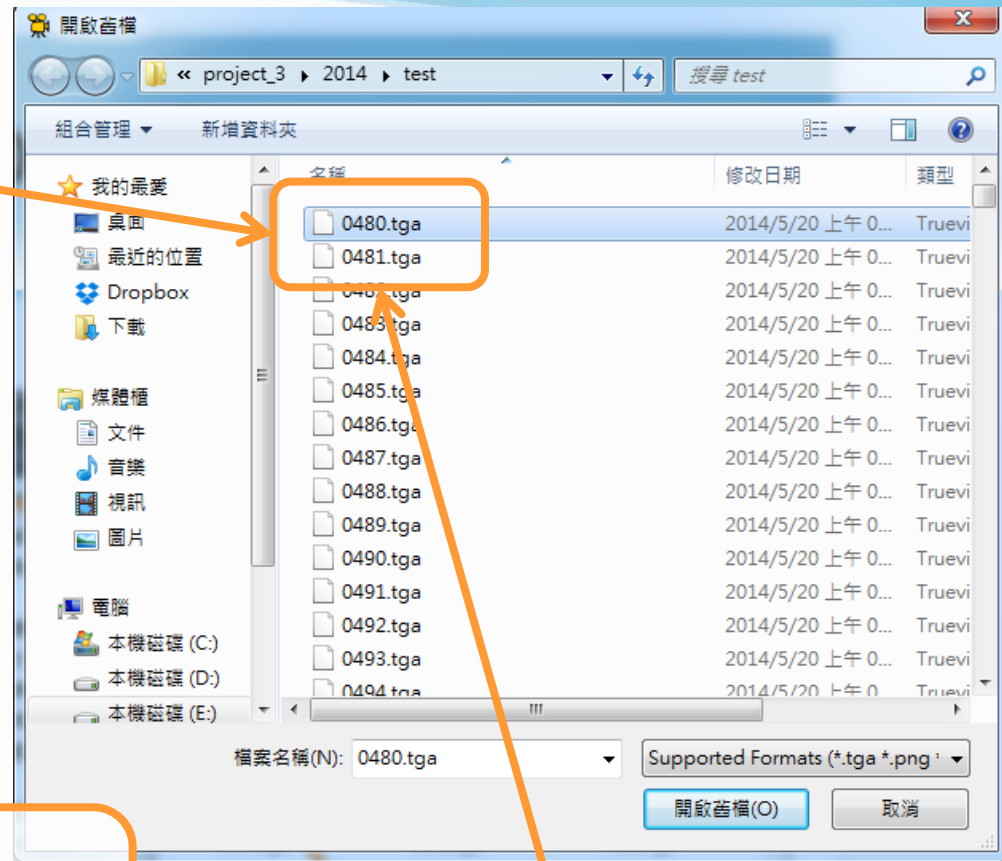
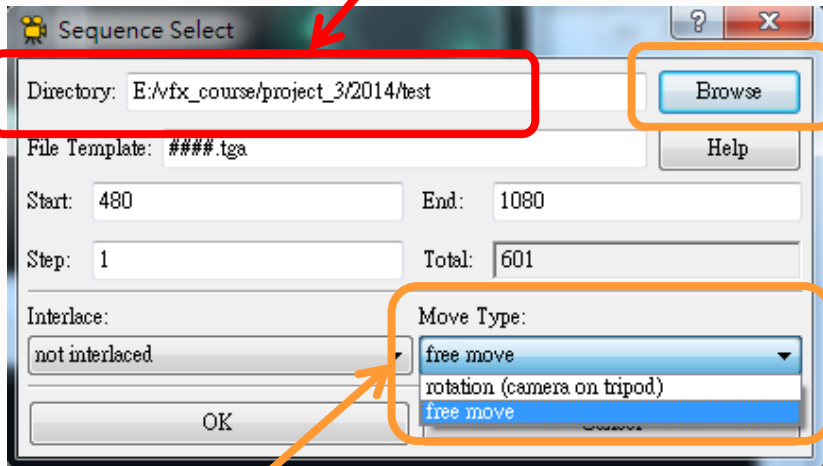
Step 1-1 : Choose Sequence

File → Open → Sequence



Step1-2 : Choose Sequence

Avoid unrecognized path



Choose "free move"

Note!!!

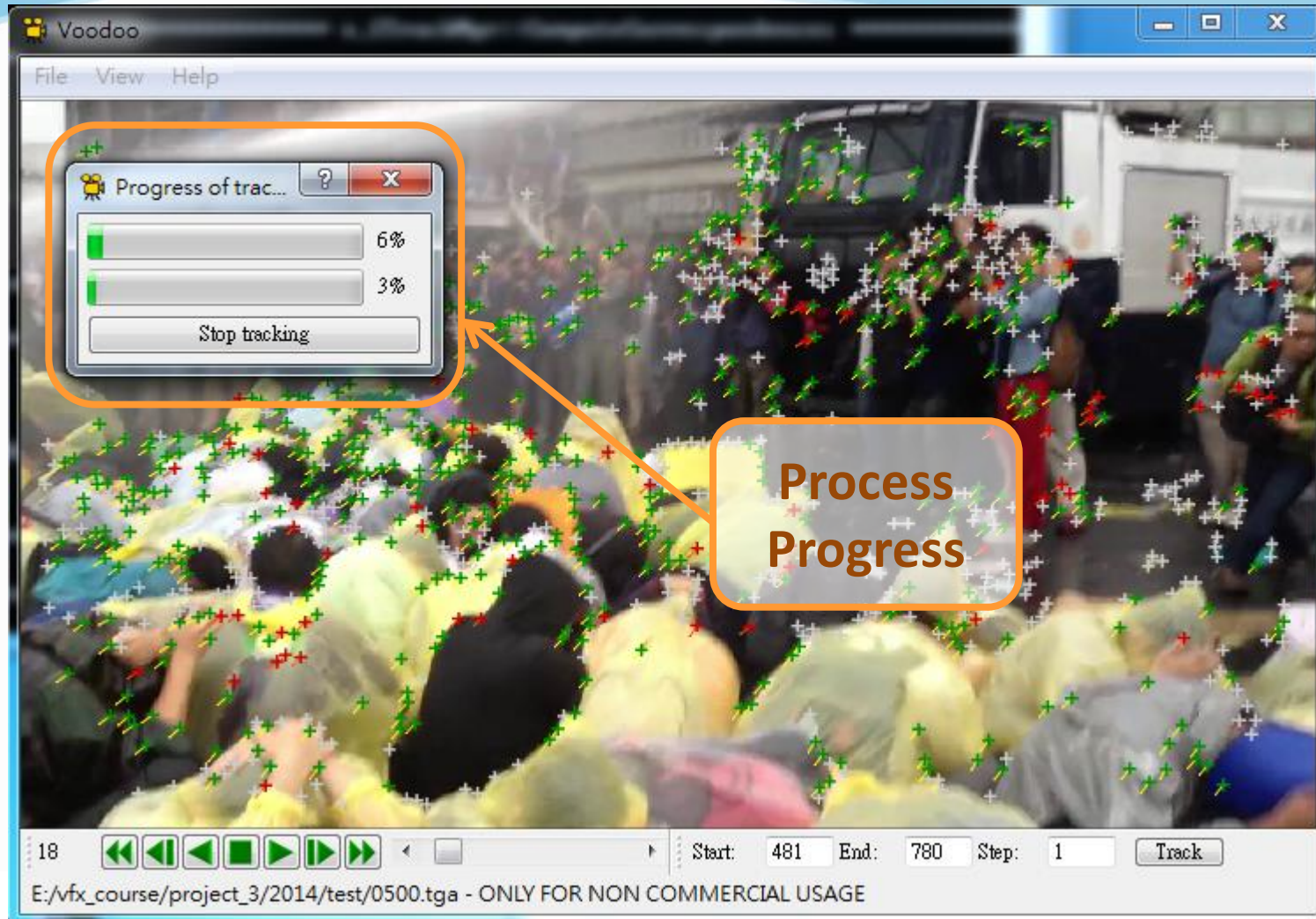
1. "free move" is for general moving conditions
2. "rotation (camera on tripod)" is for the special case with only the rotation

Select 1st frame

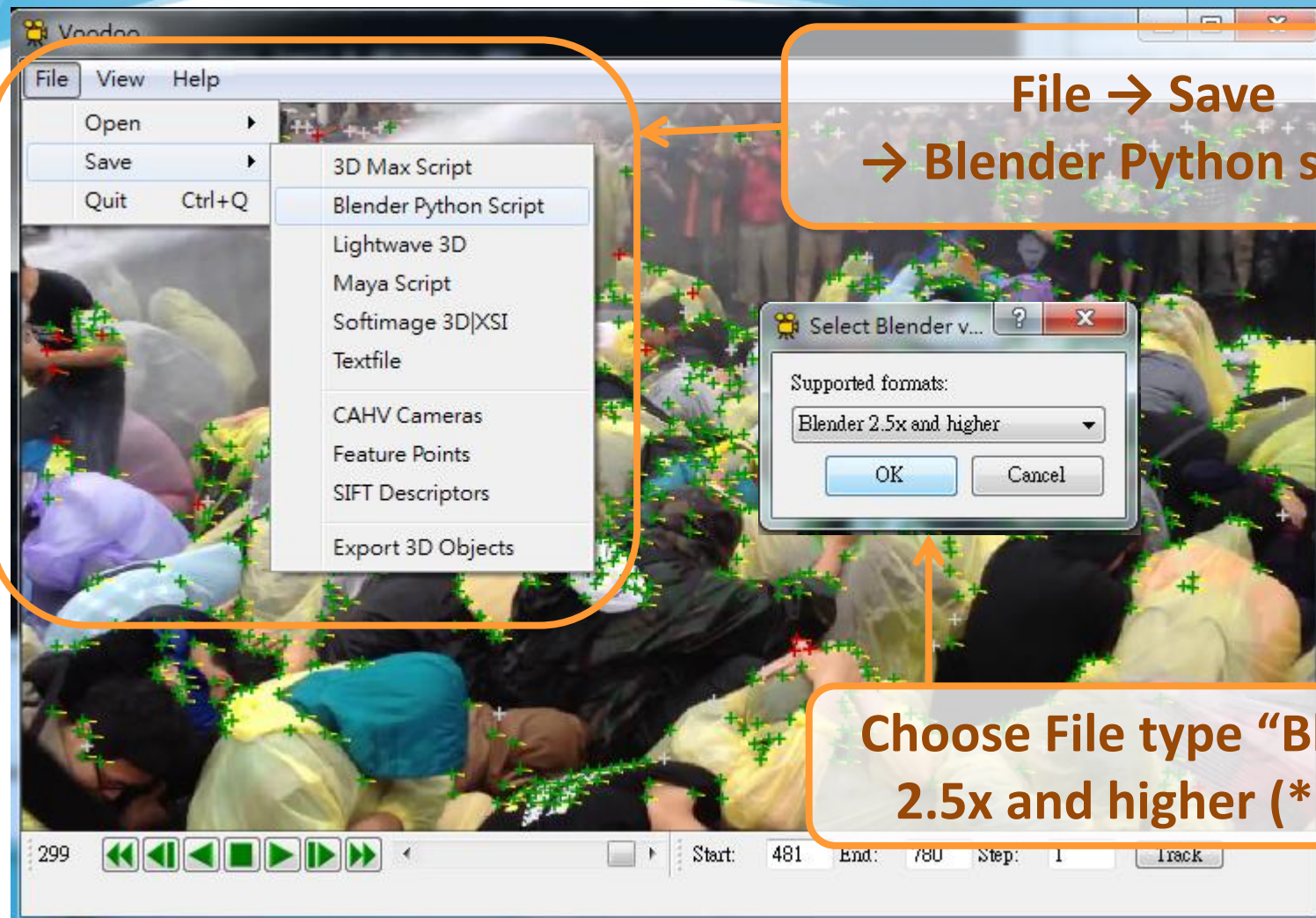
Step 2-1 : Track



Step 2-2 : Track



Step 3-1: Export Python Script



**File → Save
→ Blender Python script**

**Choose File type “Blender
2.5x and higher (*.py)”**

Note

- I meet problems on Voodoo
 - Voodoo sometimes crashes due to
 - Too large file size
 - Too complicated tracking situation
 - The tracking result is not satisfying
- Solution
 - Split your video into smaller clips
 - Use Blender (need to give camera parameters)
http://wiki.blender.org/index.php/Dev:Ref/Release_Notes/2.70/Motion_Tracker

Recipe: Import 3D Motions

1. Open **Blender**
2. Delete Default Objects
 - Choose the object and click **“Delete”**
3. Load Python Script
 - Change Window Type to **Text Editor**
 - Select **Text** → **Open Text Block**
 - Select `io_import_voodoo_camera_fix.py` and **Run Script**
 - Import `voodoo_camera` to run previous .py file
4. Adjust Rendering Property

Recipe: Import 3D Motions

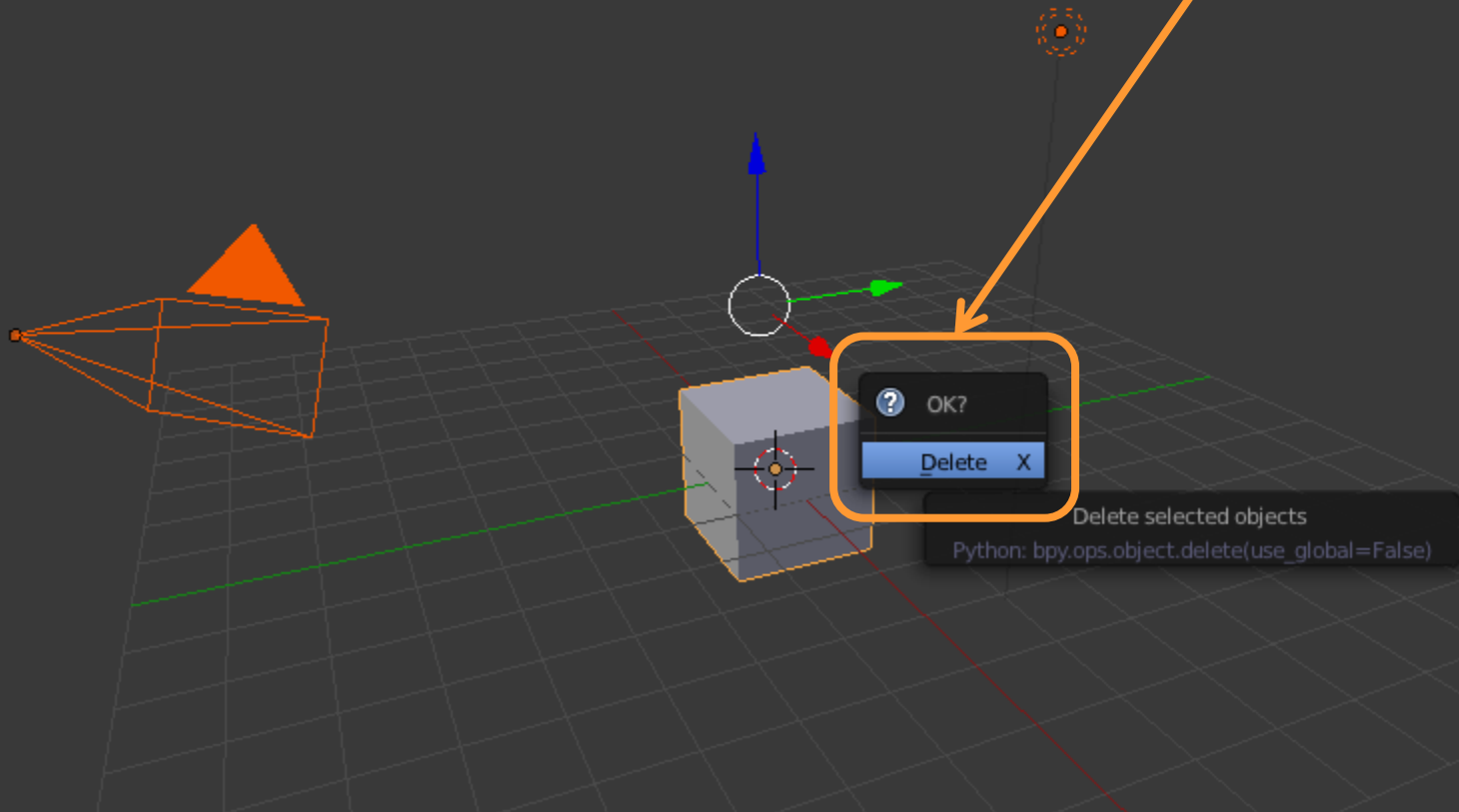
5. Load Background Images:
 - Change Window Type to **3D View**
 - Select **View** → **Cameras** → **Set Active Object as Active Camera**
 - Load background images
 - Set the video parameters of background images
 - Change the view
 - **View** → **View Persp/Ortho**
 - **View** → **Front**
 - Check any frame and adjust the opacity of background images
6. **Load models & editing their motions in the video!**

Step 1: Delete Default Objects

User Persp

Press "a" twice to
select all objects

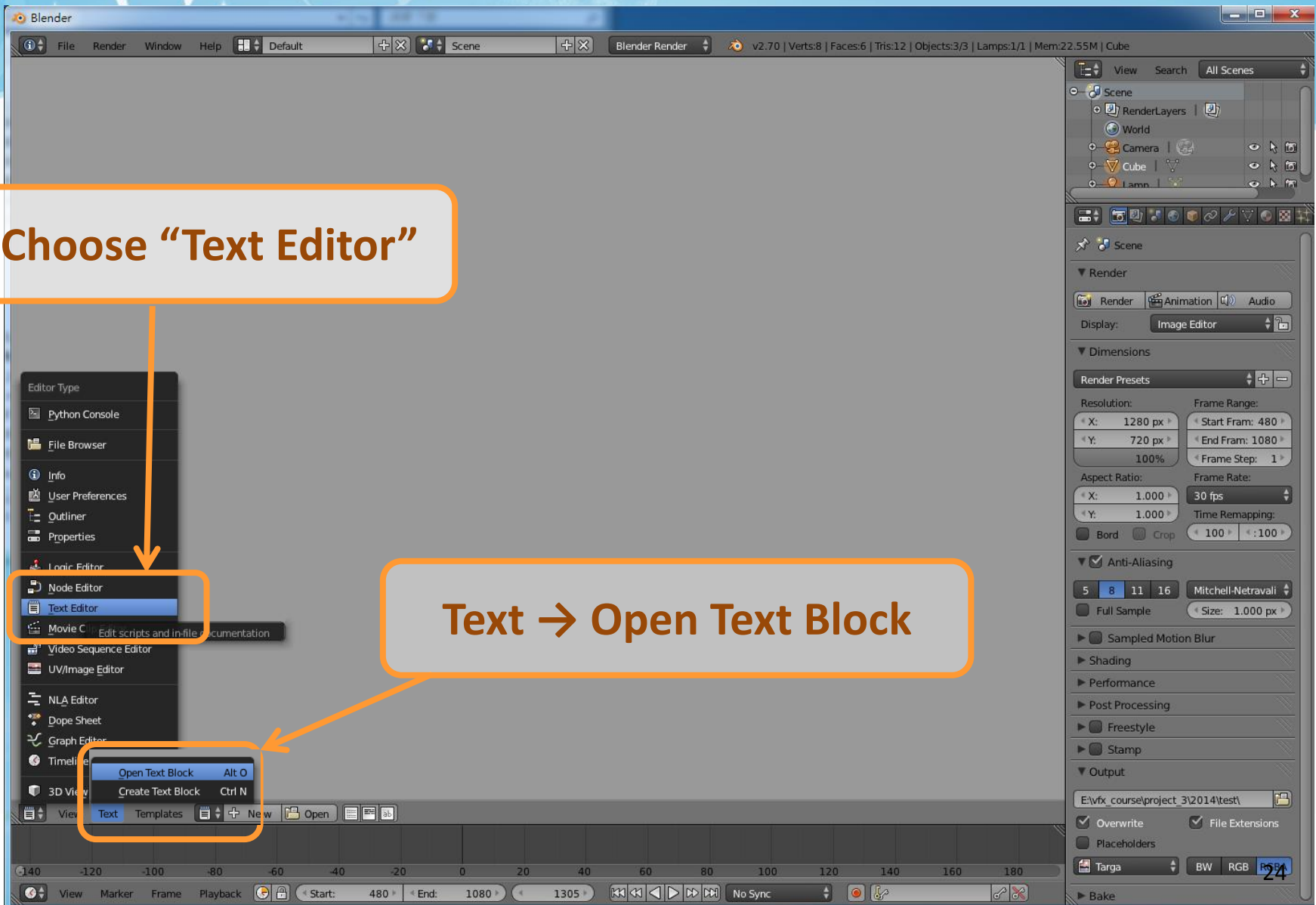
Click "Delete" to erase



Step 2-2 : Load Python Script

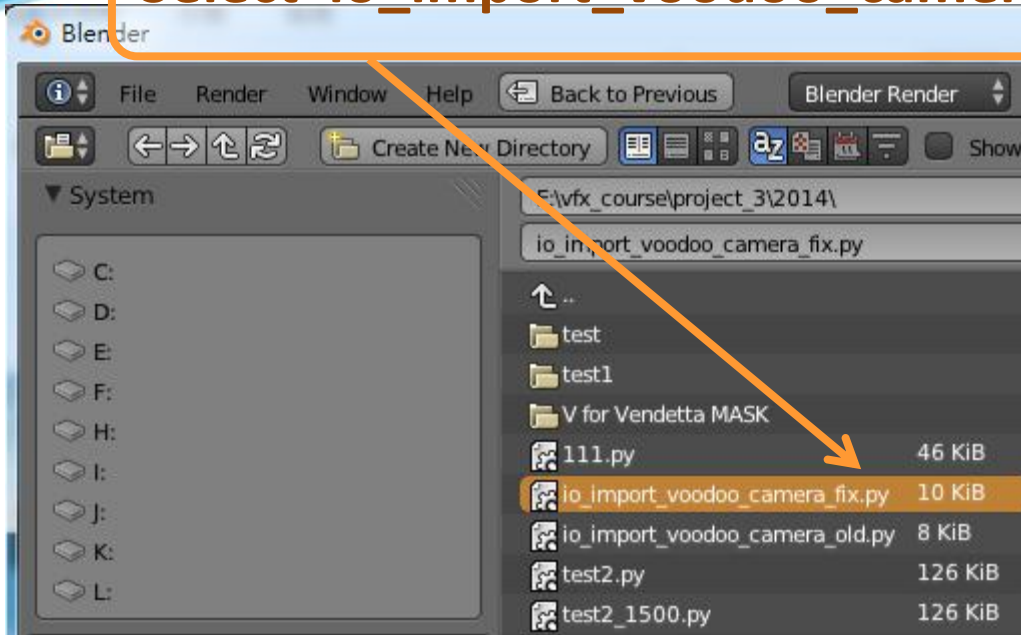
Choose "Text Editor"

Text → Open Text Block

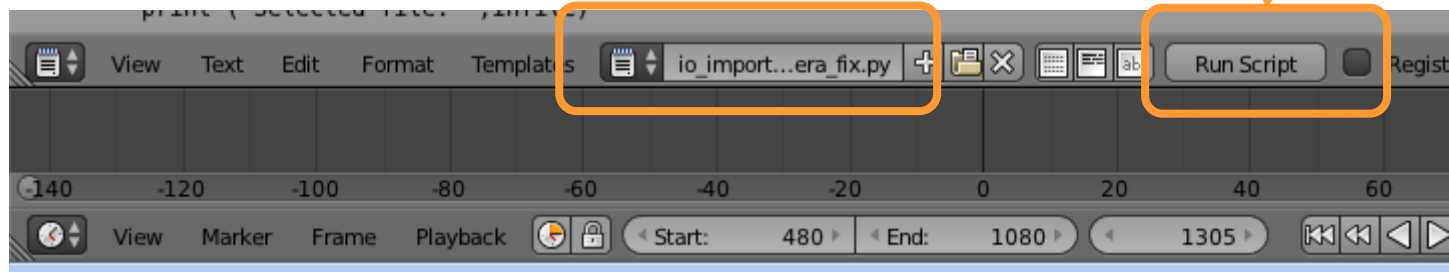


Step 2-3 : Load Python Script

Select `io_import_voodoo_camera_fix.py` <http://ppt.cc/BNkt>



Run Python Script



Step 2-4 : Load Python Script

File → Import → Voodoo camera

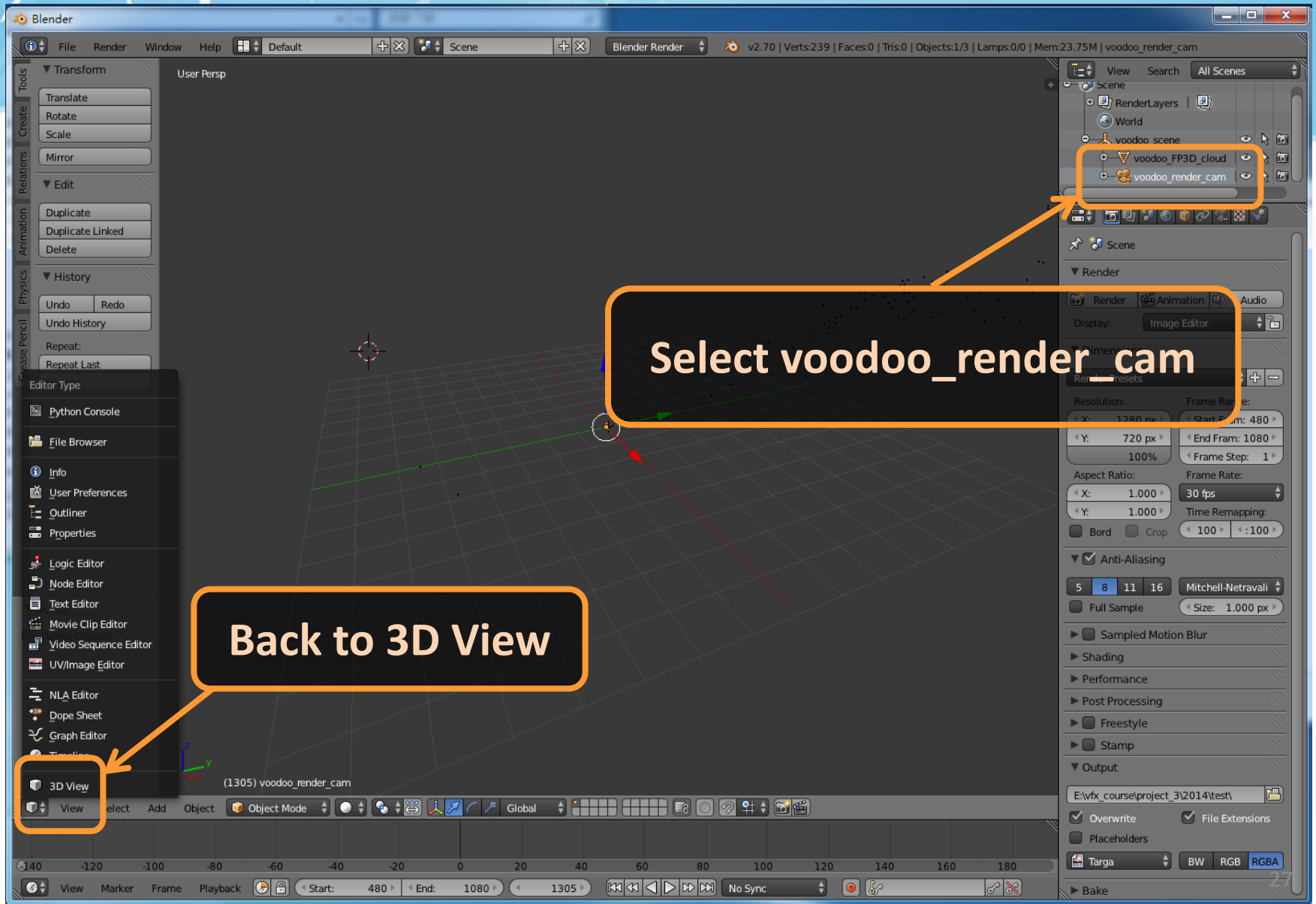
Choose previous .py file

The image shows two screenshots of the Blender 2.70 interface. The top screenshot shows the 'File' menu open, with the 'Import' option selected. A callout box points to the 'Voodoo camera' option in the import list. The bottom screenshot shows the file explorer, with the 'test2.py' file selected. A callout box points to the 'test2.py' file in the file explorer.

```
#####  
#  
# This program is free software; you can redistribute it and/or  
# modify it under the terms of the GNU General Public License  
# as published by the Free Software Foundation; either version 2  
# of the license, or (at your option) any later version.  
#  
# This program is distributed in the hope that it will be useful,  
# but WITHOUT ANY WARRANTY; without even the implied warranty of  
# MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the  
# GNU General Public License for more details.  
#  
# You should have received a copy of the GNU General Public License  
# along with this program; if not, write to the Free Software  
# Foundation, Inc., 51 Franklin Street, Boston, MA 02110-1301, USA  
#####  
  
bl_in import Voodoo  
import Voodoo  
Fazekas Laszlo  
  
"tracker_url": "https://projects  
"func=detail&aid=22510",  
"category": "Import-Export"}  
  
""  
This script loads a Blender Python  
tracker program into Blender 2.5x.  
  
It processes the script as a text file and not as a Python executable  
because of the incompatible Python APIs of Blender 2.4x/2.5x/2.6x.  
""
```

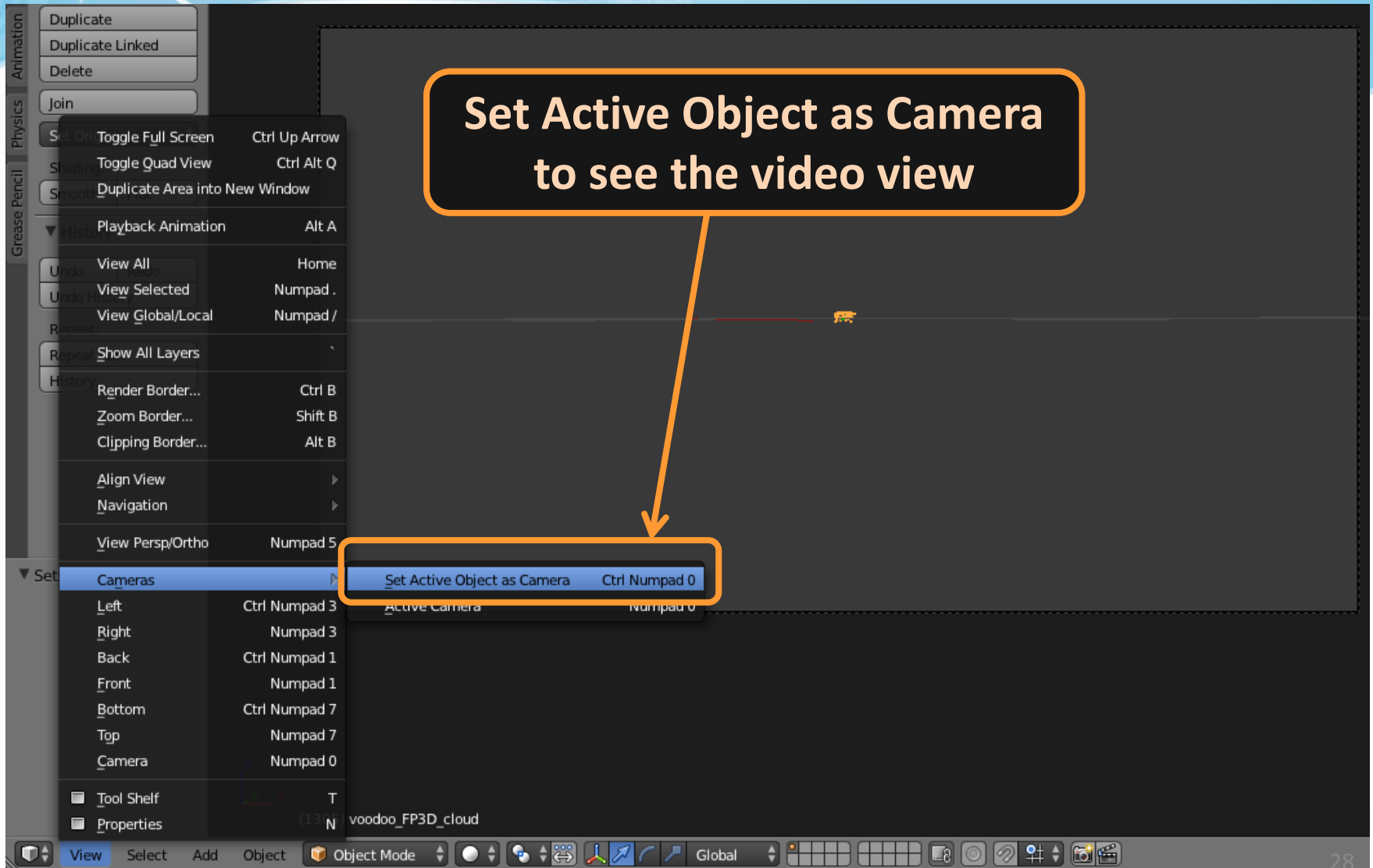
File Name	Size
test2.py	126 KiB
test2_1500.py	126 KiB
MatchMove_2014.pdf	5.9 MiB
MatchMove_2014.pptx	27.0 MiB
io_import_voodoo_camera_fix.py	10 KiB
io import voodoo camera old.py	8 KiB
111.py	46 KiB
0001-0120.avi	105.5 MiB
V for Vendetta MASK	
test1	
test	
test2.py	126 KiB

Step 3-1 : Load Background Images



Step 3-1 : Load Background Images

**Set Active Object as Camera
to see the video view**

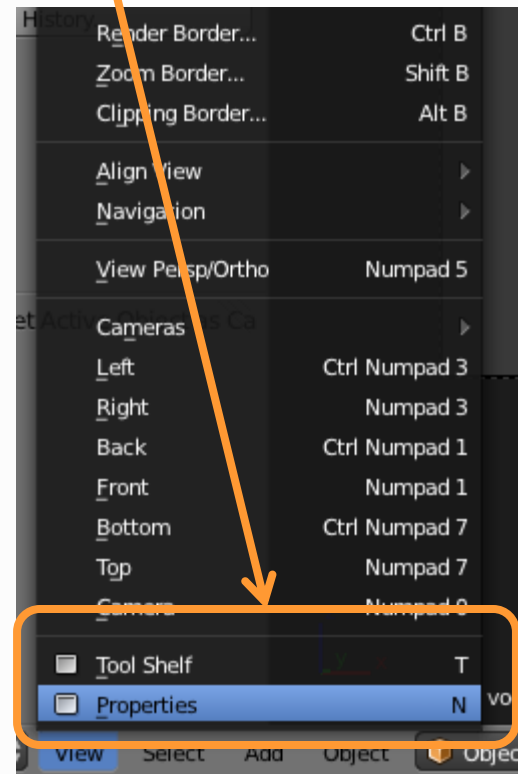
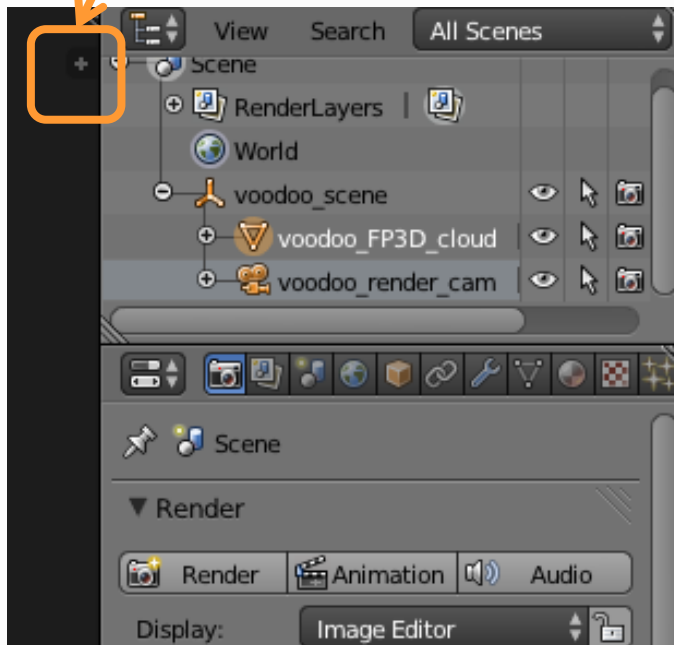


Step 3-3 : Load Background Images

Click the “+”

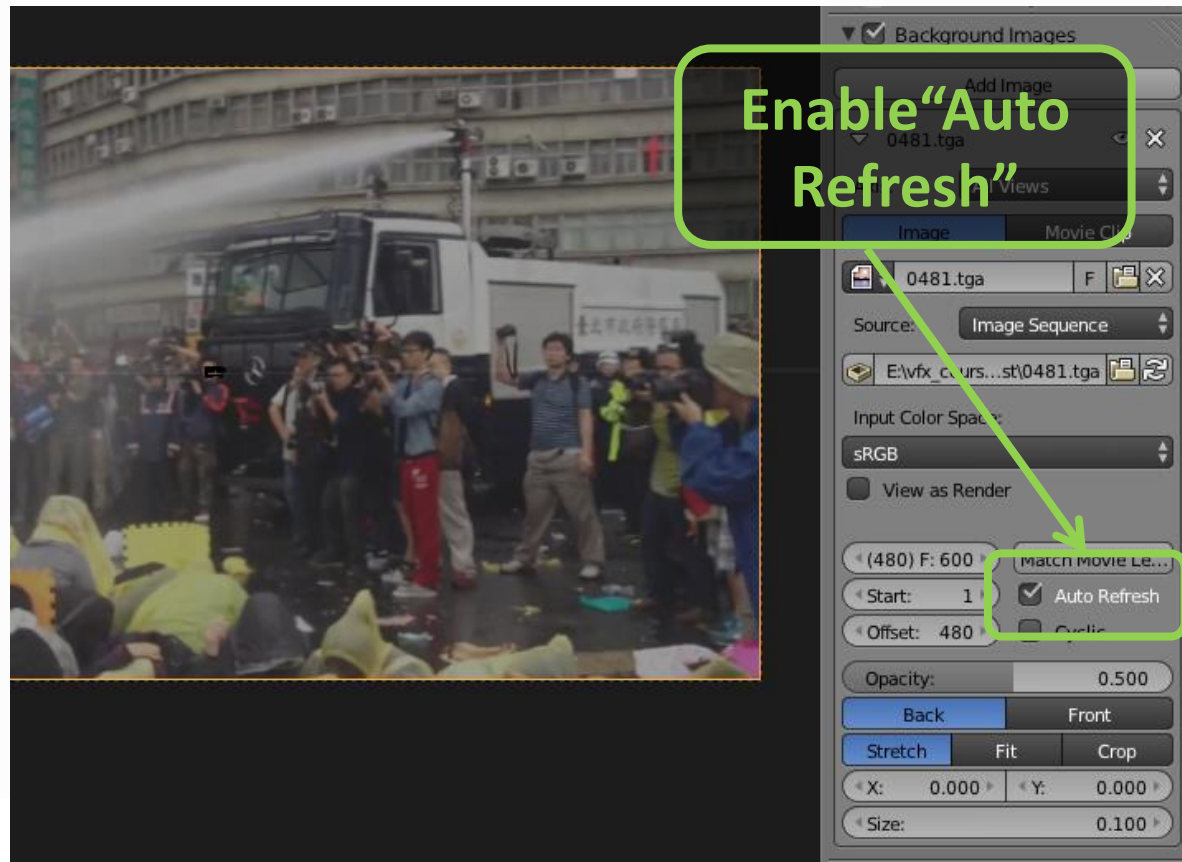
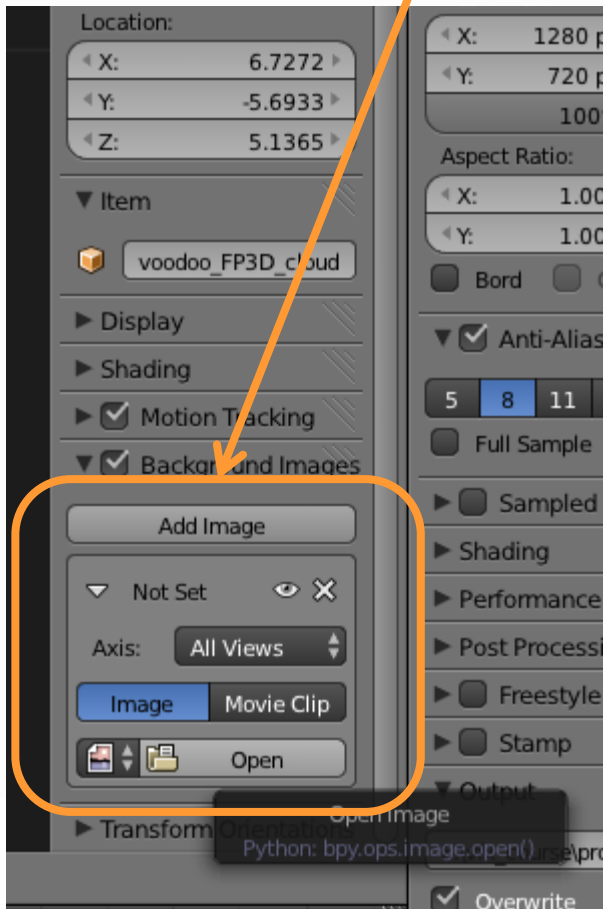
or

View → Properties

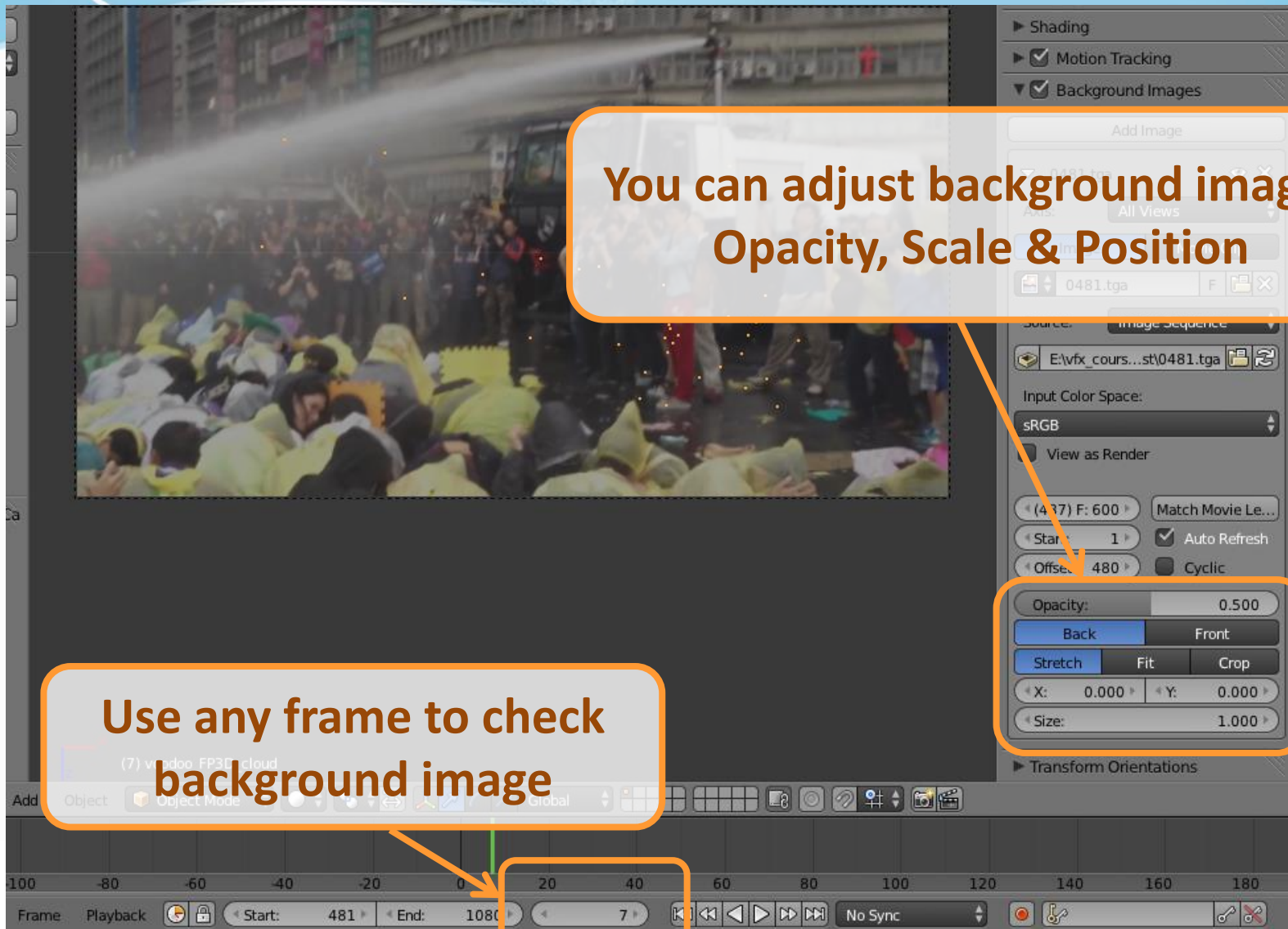


Step 3-3 : Load Background Images

Tick off “Background Images”, click “Add Image”
Then Open Image Sequence/ Video Clip



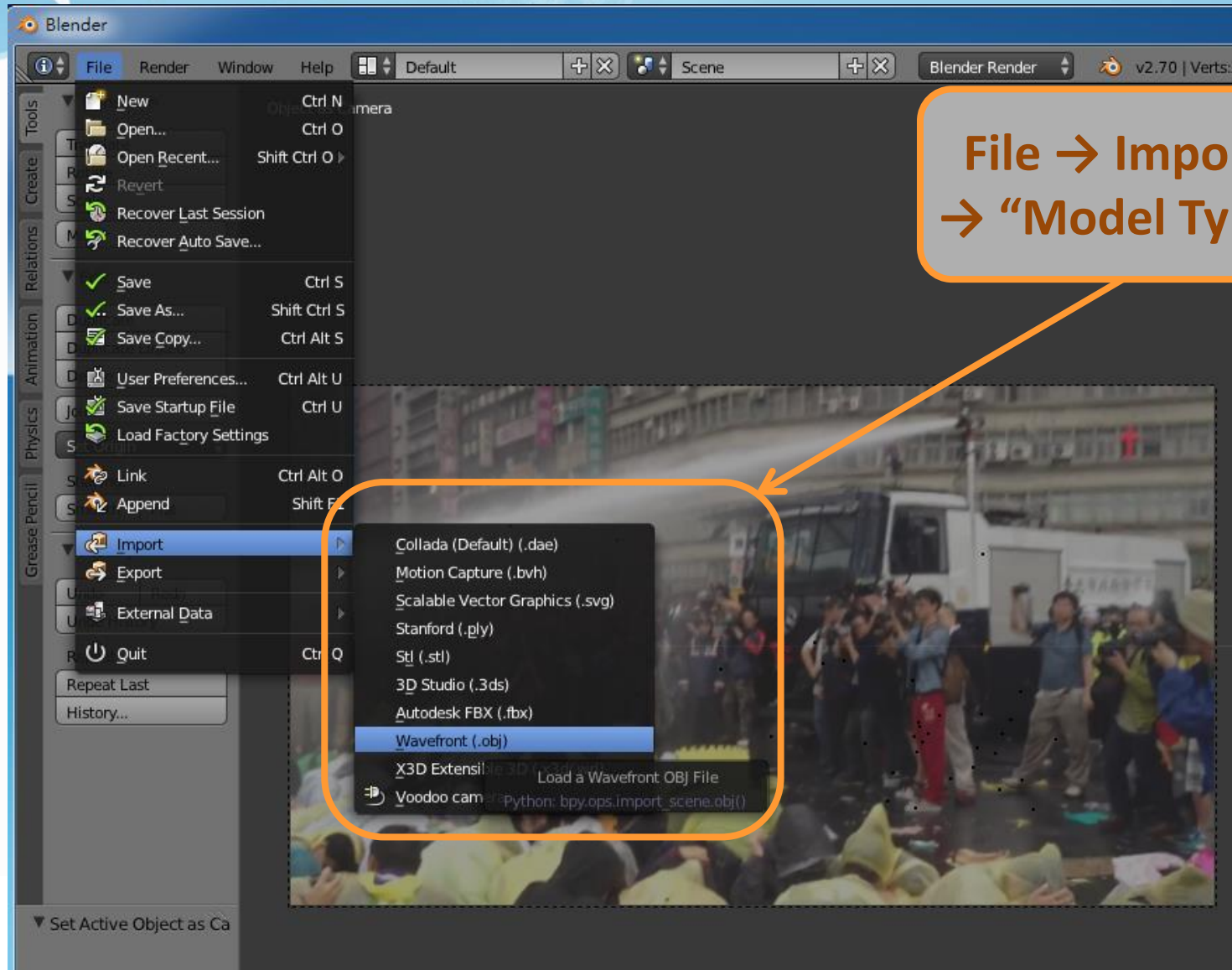
Step 3-6 : Load Background Images



You can adjust background image's Opacity, Scale & Position

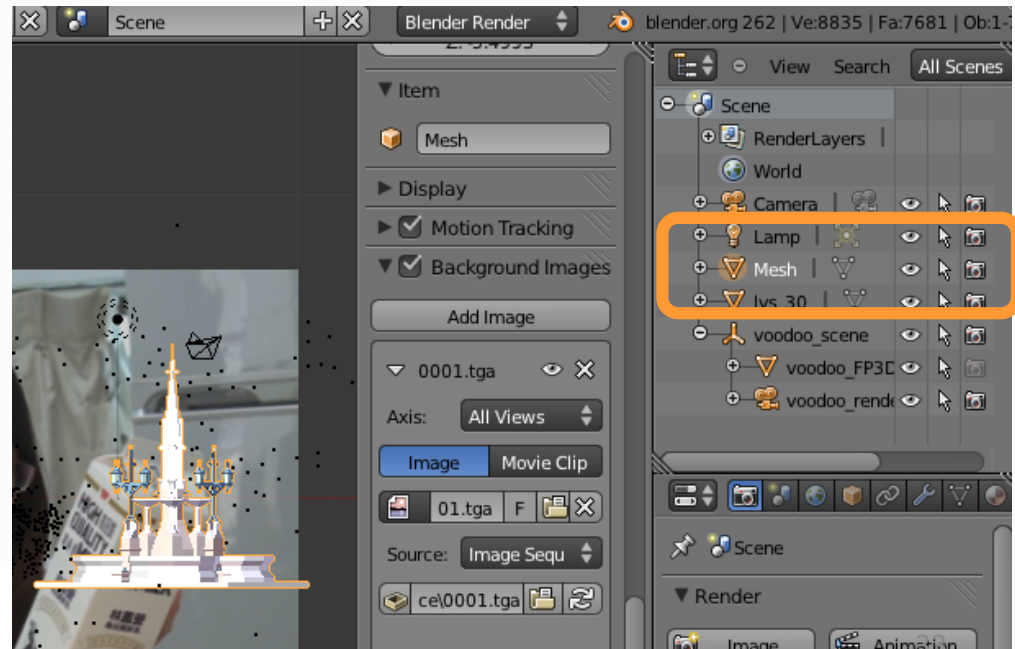
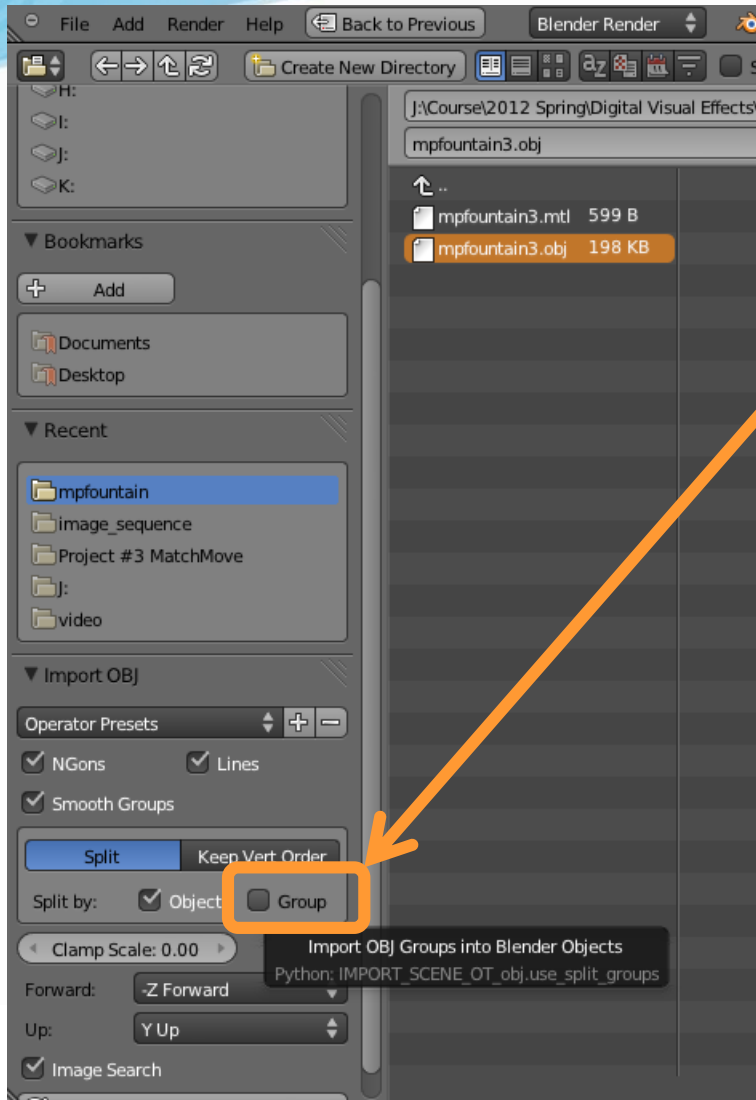
Use any frame to check background image

Step 5-1 : Load Models

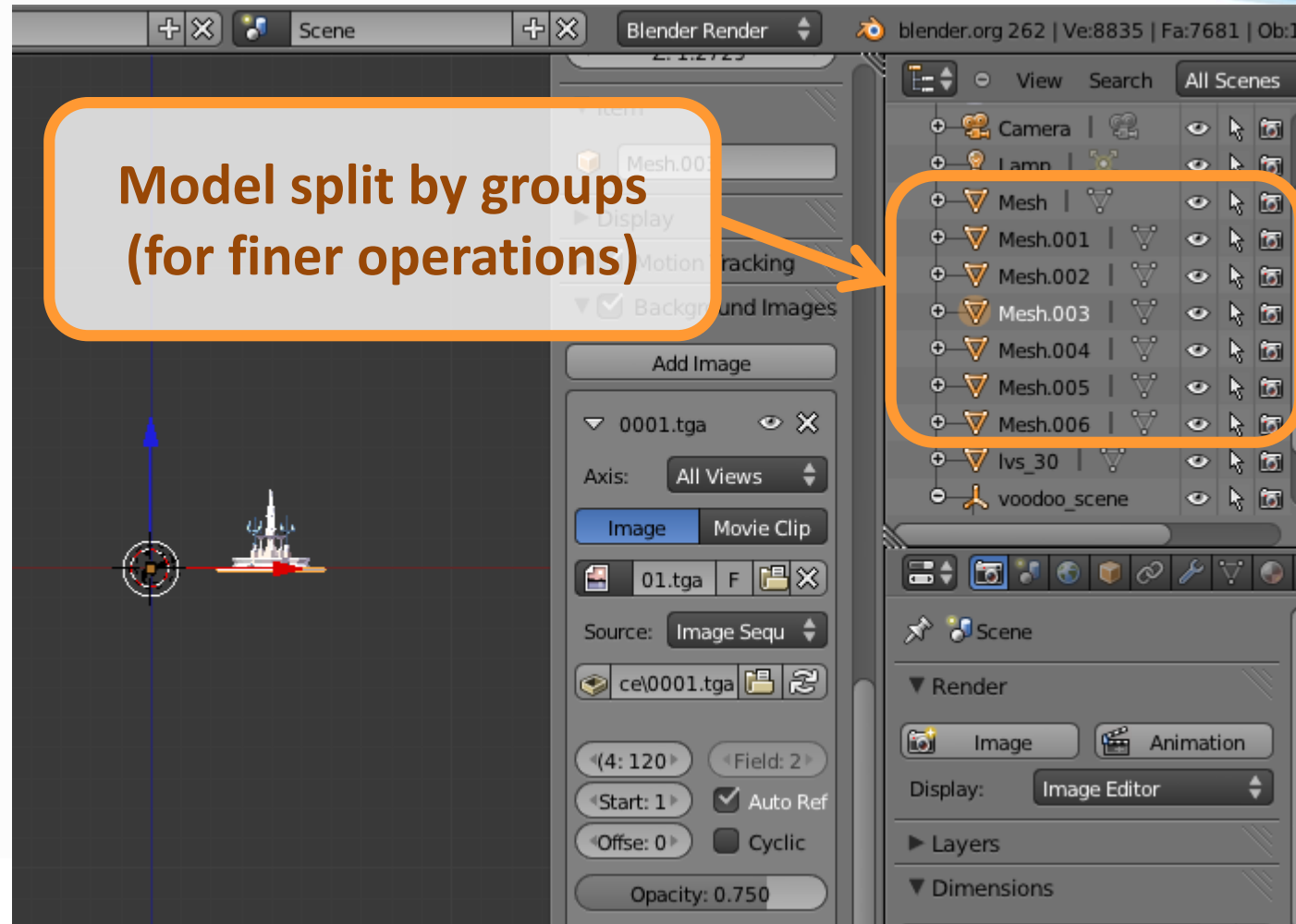


Step 5-2 : Load Models

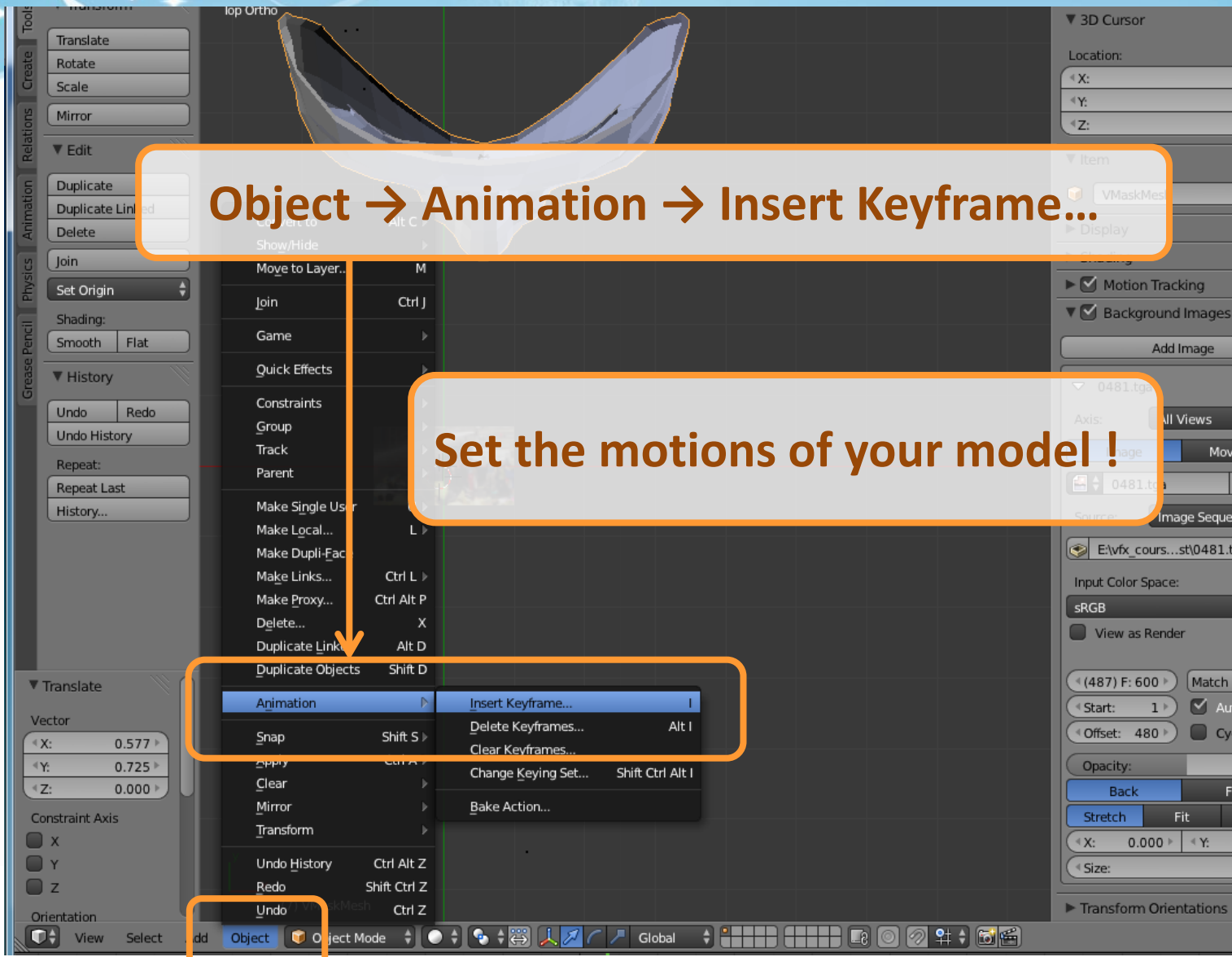
To use the model as a “single object” instead of many “small groups(components)”, you can close the group options



Step 5-2 : Load Models



Step 6-1 : Set Keyframes



Step 6-2 : Set Keyframes

Model parameters and corresponding lock in keyframe

Lock the parameters in keyframe

Choose Object Mode

Choose keyframe

World
VMaskMesh
Animation
VMaskMesh
voodoo_scene
voodoo_FP3D_cloud

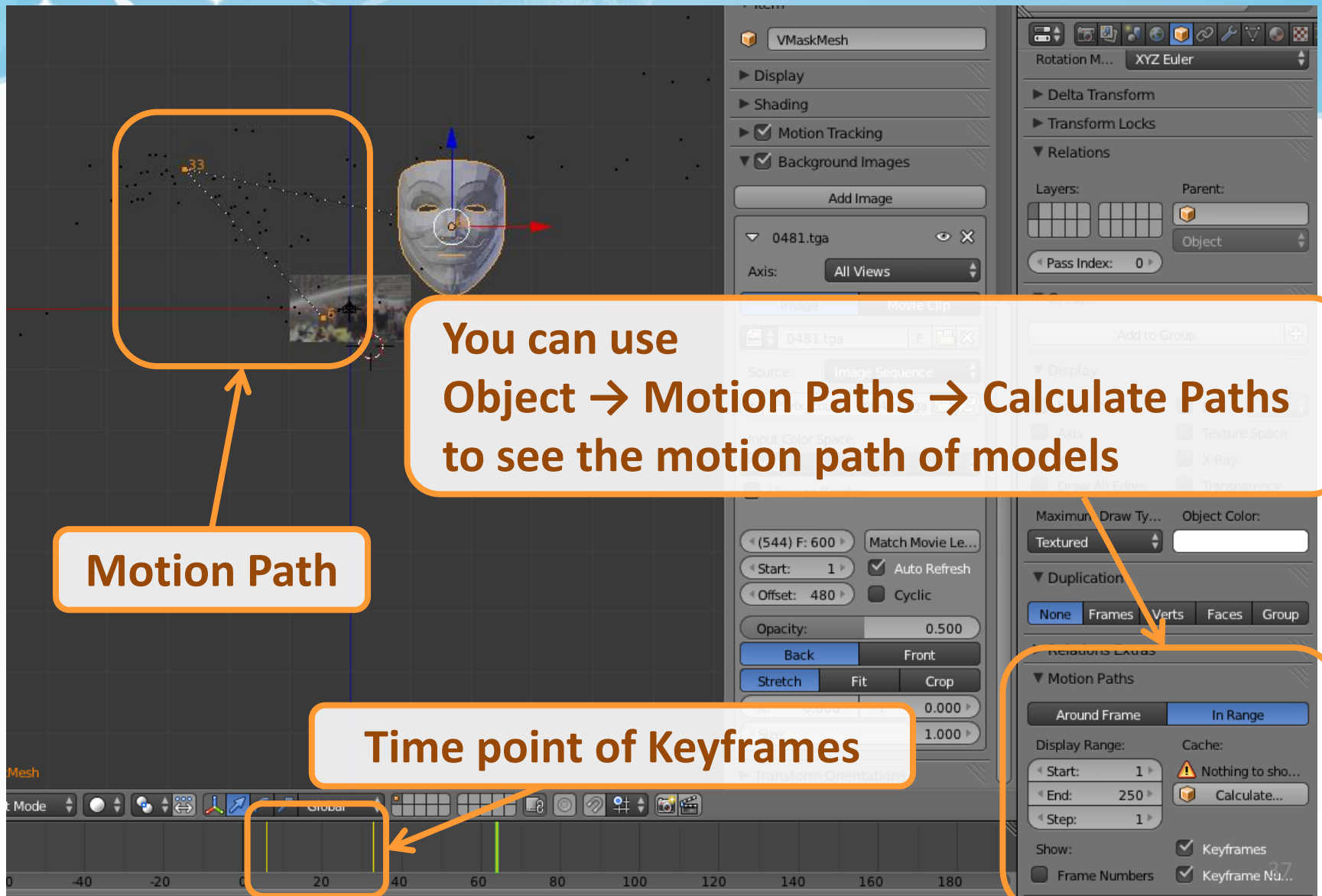
Location: X: 4.2142 Y: 6.8072 Z: 0.0889
Rotation: X: 90° Y: -0° Z: 0°
Scale: X: 1.000 Y: 1.000 Z: 1.000
Rotation M... XYZ Euler

Insert Keyframe Menu
Location
Rotation
Scaling
LocRot
LocScale
LocRotScale
RotScale
Visual Location
Visual Rotation
Visual Scaling
Visual LocRot
Visual LocScale
Visual LocRotScale
Visual RotScale
Available
Delta Location
Delta Rotation
Delta Scale

Object Mode

6

Step 6-3 : Set Keyframes



Motion Path

**You can use
Object → Motion Paths → Calculate Paths
to see the motion path of models**

Time point of Keyframes

Motion Paths

Around Frame | **In Range**

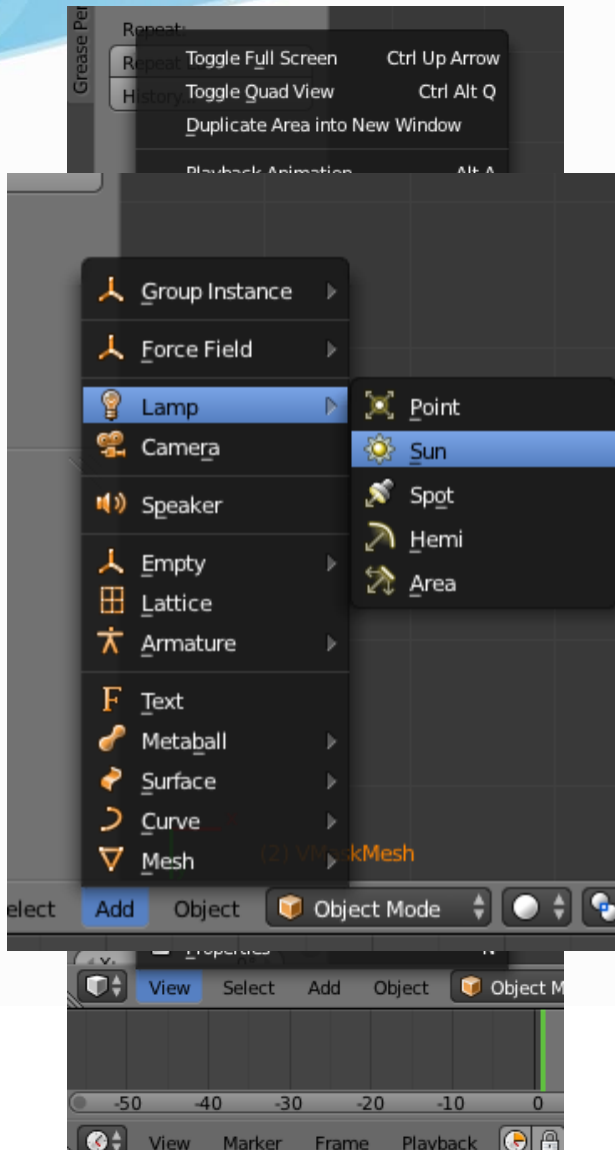
Display Range: Start: 1 | End: 250 | Step: 1

Cache: Nothing to show... | **Calculate...**

Show: Keyframes | Keyframe Nu...

Frame Numbers

Step 6-4 : Set Keyframes



Some notes

- ✓ **Different camera views are helpful**
 - Fine adjust 3D position & shape
- ✓ **Preview is your good friend**
 - Ensure your model condition shown in that frame
- ✓ **Don't forget the light (lamp)**
 - Preview won't show the lighting
 - Avoid model "in the dark"
- ✓ **Unstable model motion**
 - Set more keyframes
 - Split fast-moving video into more small-period clips

Recipe: Compositing

1. Add Image Sequence

- Change Window Type to **Video Scene Editor**
- Select **Add → Images** and select all images
- Drag the strip to the “1st Frame” in Layer 1

2. Add Scene

- Select **Add → Scene**
- Drag the scene strip to the “1st Frame” in Layer 2

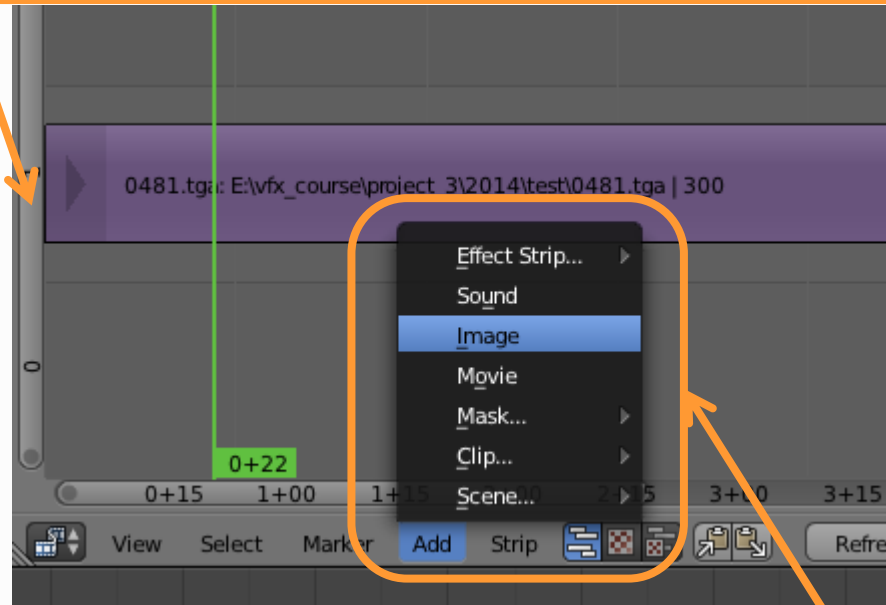
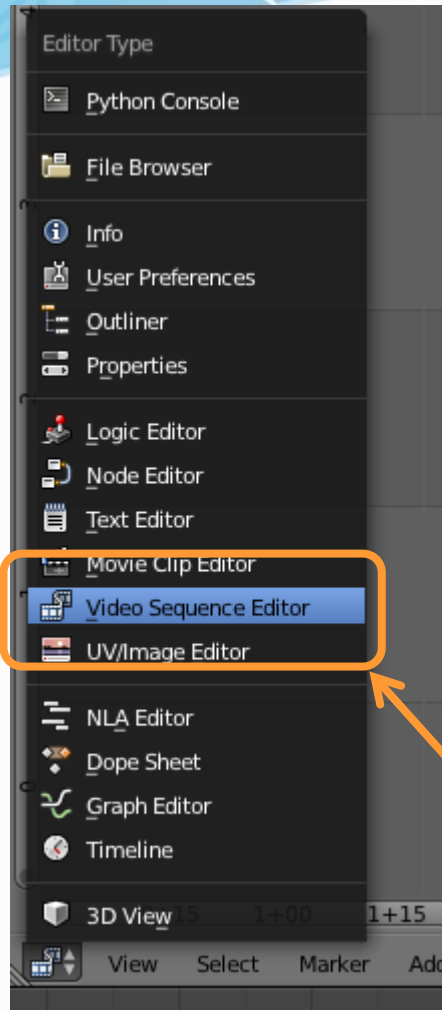
3. Set Scene

- Change scene property to “**Alpha Over**”
- Set frame and video parameters

4. Click **Animation**

Step 1 : Add Image Sequence

Drag the strip to the "1st Frame" in Layer 1
(Right click and drag, left click to set)

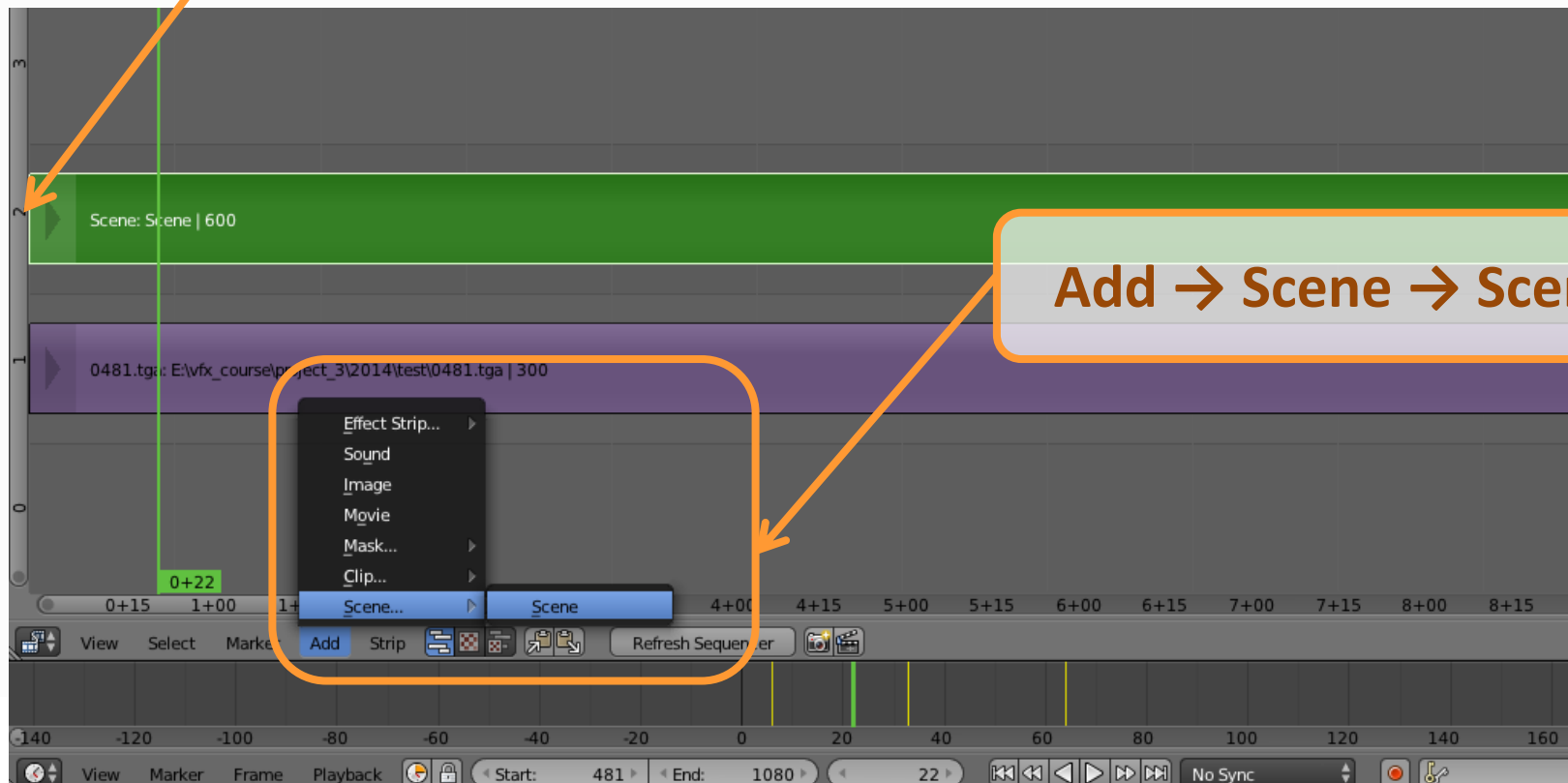


Add → Image/Movie

Choose "Sequence Editor"

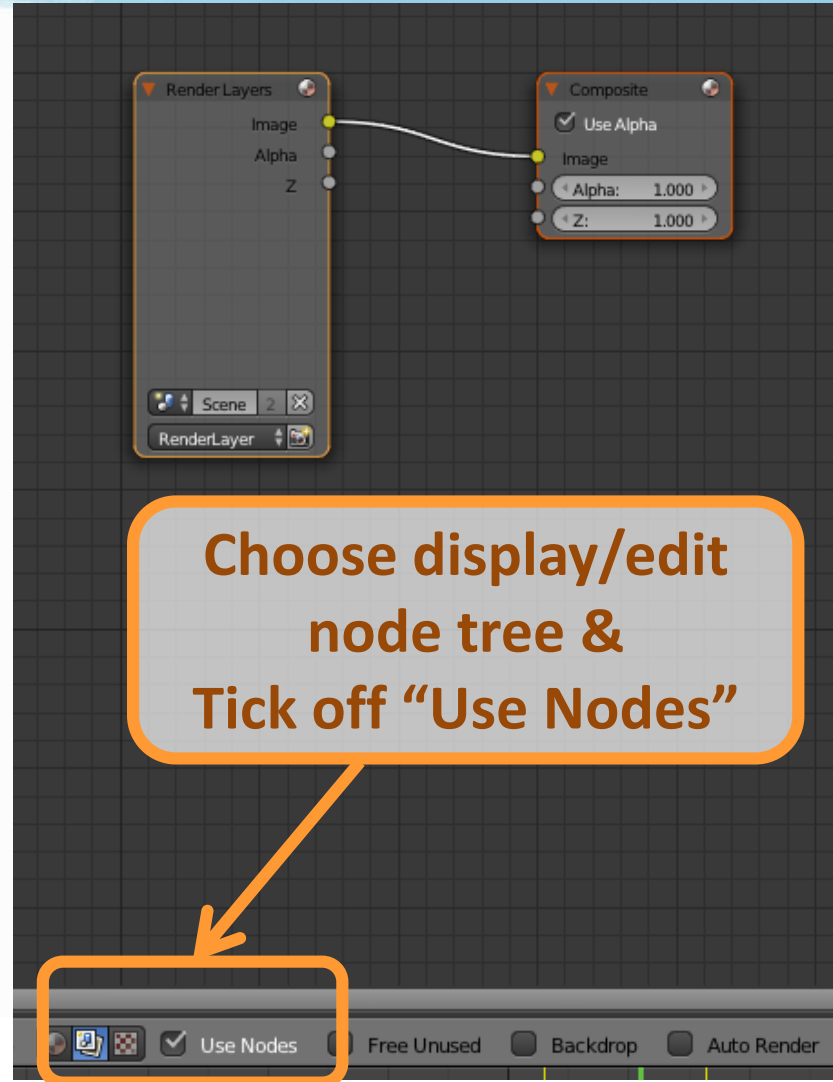
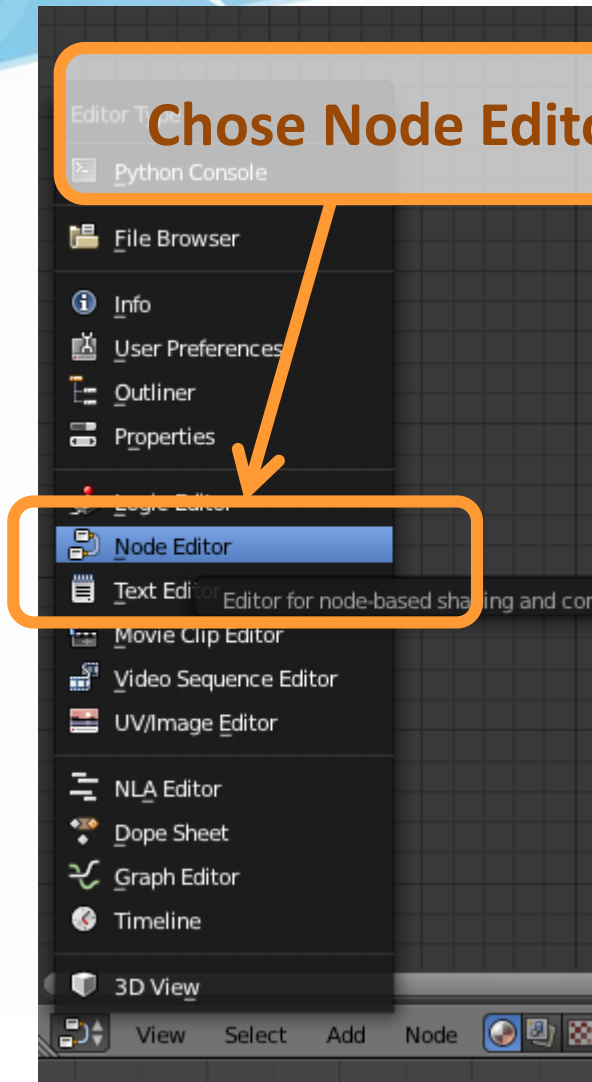
Step 2 : Add Scene

Drag the scene strip to the "1st Frame" in Layer 2



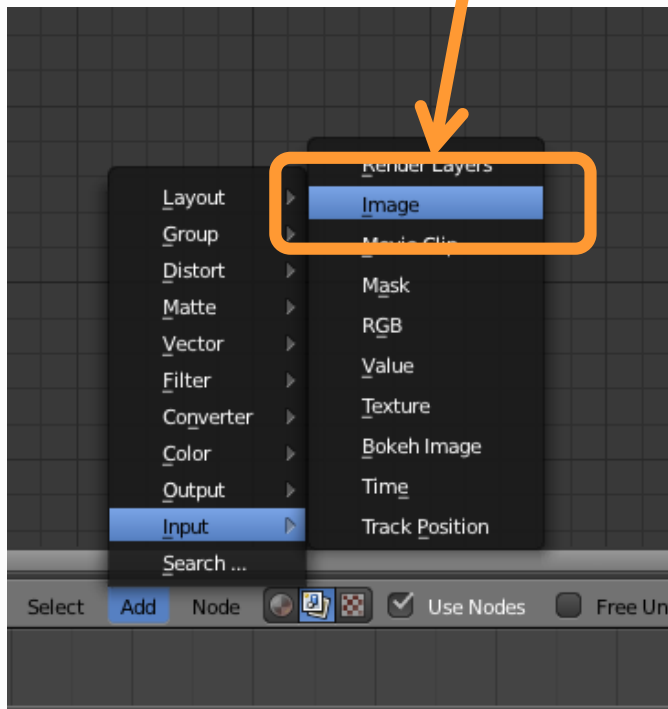
Add → Scene → Scene

Step 3-1 : Set Scene

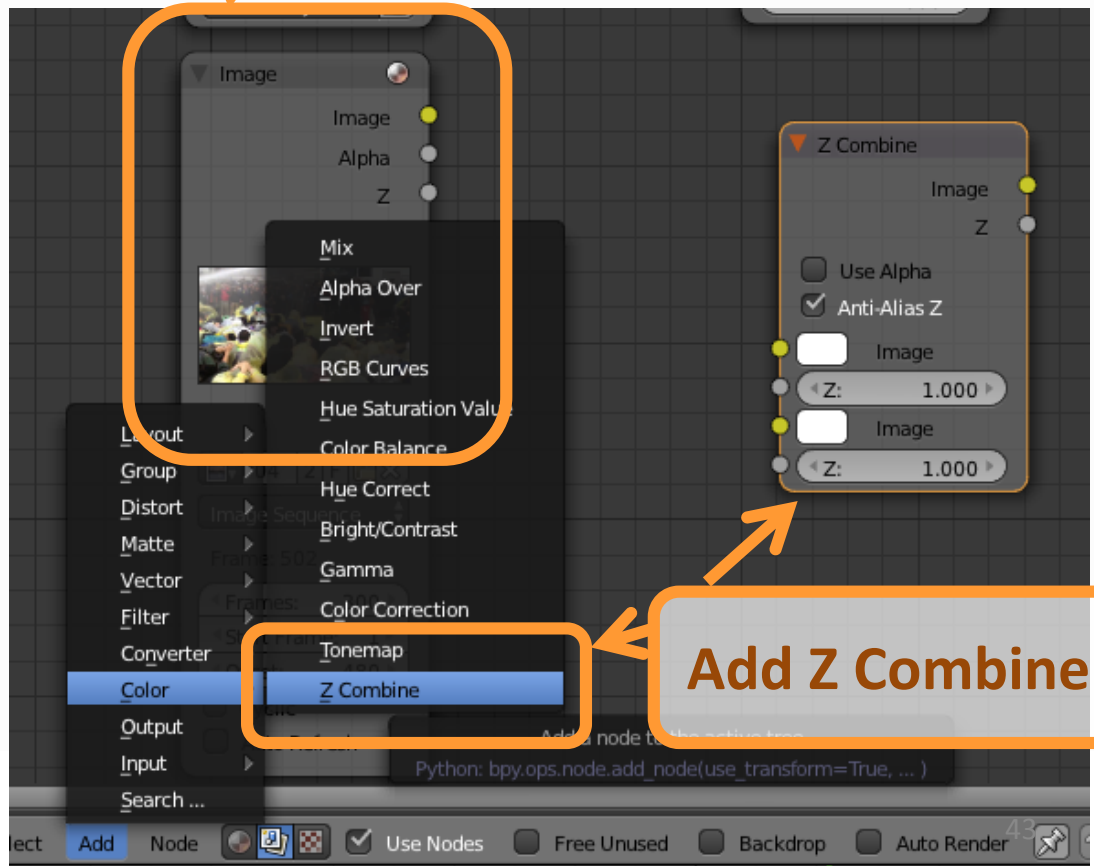


Step 3-2 : Set Scene

Add Image/Movie



Set Image Sequence



Add Z Combine

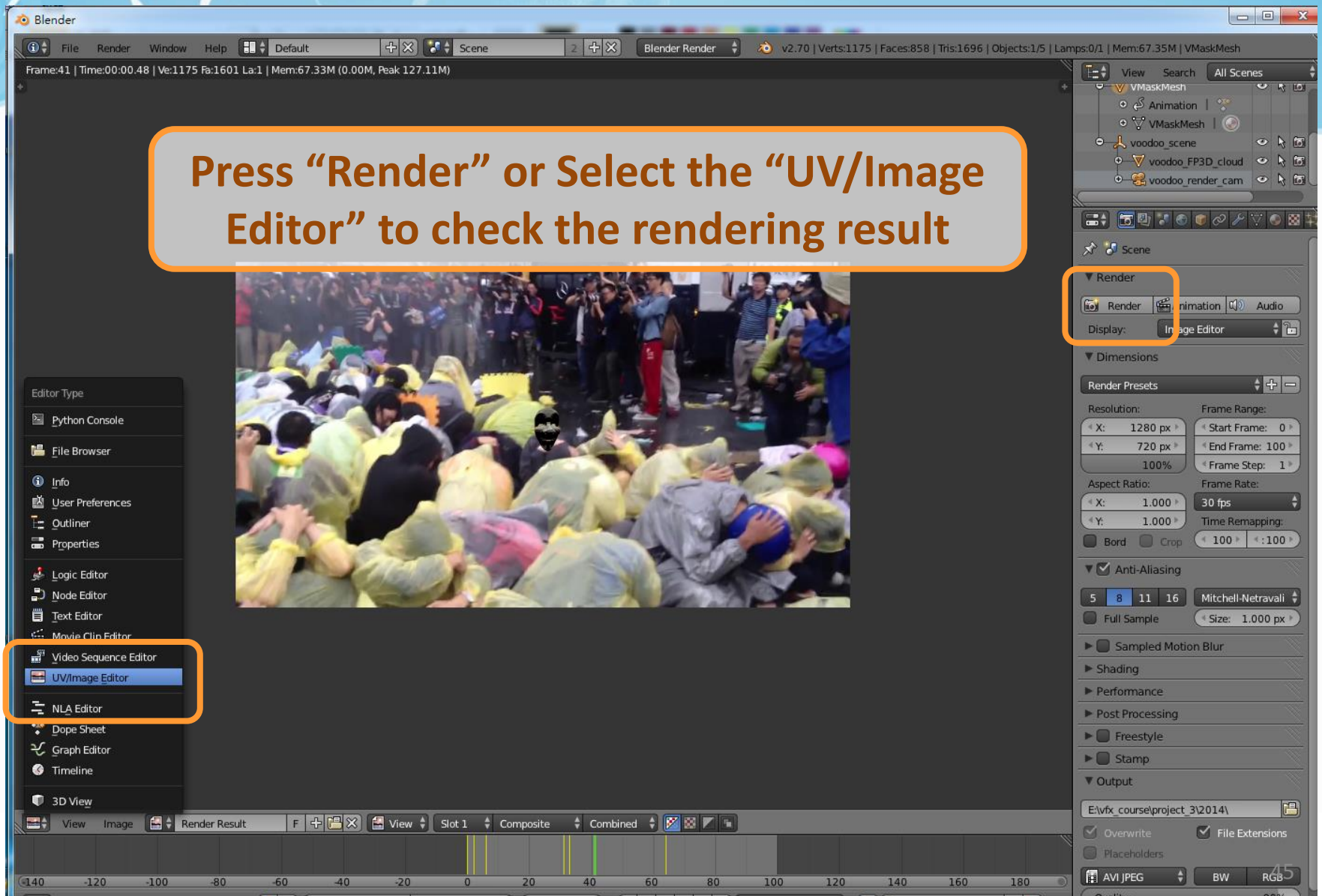
Step 3-3 : Set Scene

The screenshot displays a video editing software interface with several panels and annotations:

- Render Layers Panel:** Located at the top left, it shows a list of layers (Image, Alpha, Z) and a preview window. It is annotated with an orange box and an arrow pointing to the 'Image' layer's Z value.
- Image Panel:** Located below the Render Layers panel, it shows a video clip and a Z value of 100.000. It is annotated with a red box and a red arrow pointing to the Z value.
- Z Combine Panel:** Located in the center, it shows a list of layers (Image, Z) and a Z value of 100.000. It is annotated with a red box and a red arrow pointing to the Z value.
- Composite Panel:** Located on the right, it shows a list of layers (Image, Z) and a Z value of 1.000. It is annotated with an orange box and an arrow pointing to the Z value.
- Annotations:**
 - An orange box labeled "Adjust the step lines" with arrows pointing to the Z value inputs in the Render Layers and Composite panels.
 - A red box labeled "Layer1 Layer2" with arrows pointing to the Z value inputs in the Image and Z Combine panels.
 - A blue box labeled "Set image Z value (see the memo below)" with an arrow pointing to the Z value input in the Z Combine panel.

Step 3-4 : Set Scene

Press “Render” or Select the “UV/Image Editor” to check the rendering result

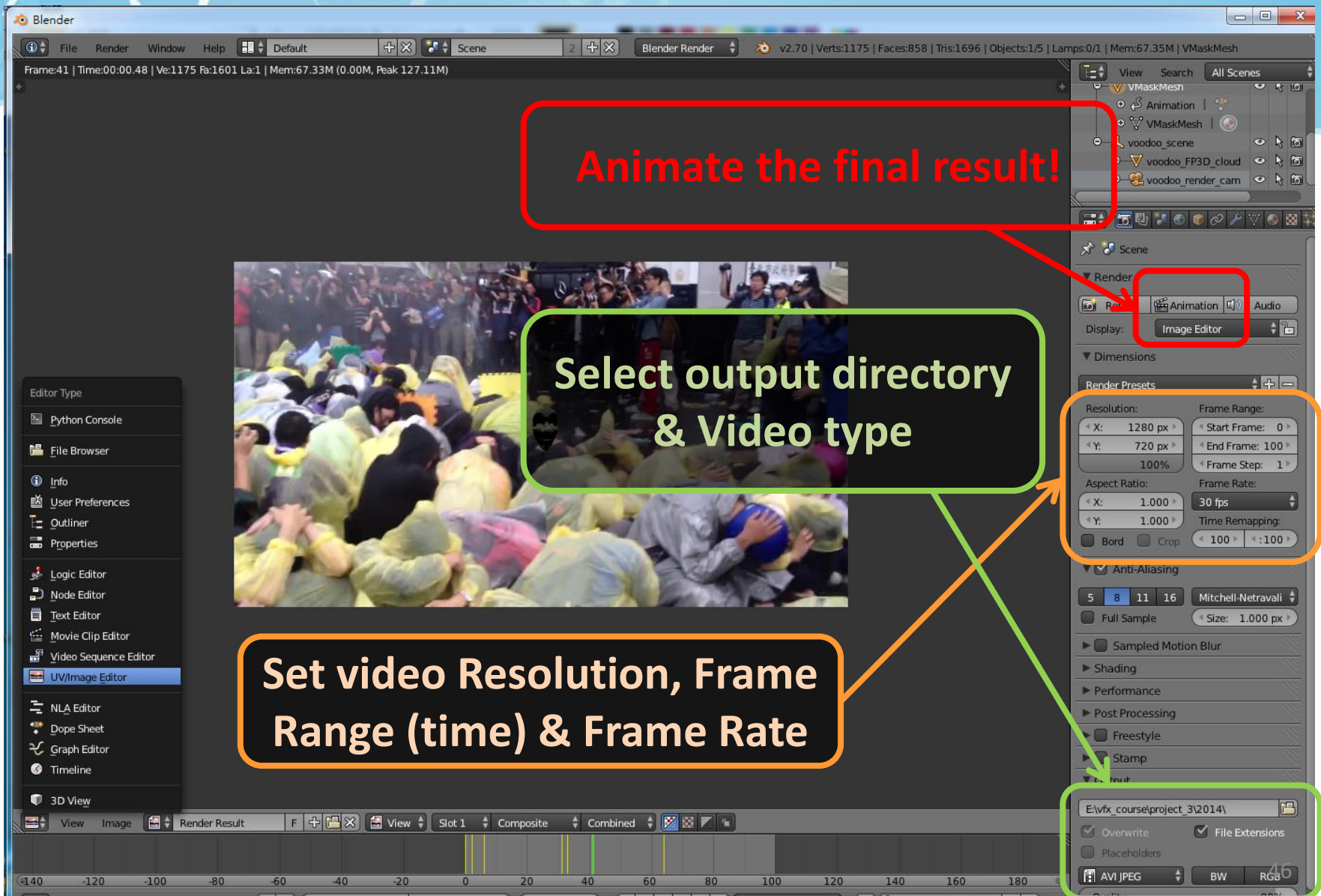


Step 3-4 : Set Scene

Animate the final result!

Select output directory & Video type

Set video Resolution, Frame Range (time) & Frame Rate



Example

- Life of Pi and R.I.P.D Tracking and MatchMove
 - <https://www.youtube.com/watch?v=IE3QwDfoyp4>
- NTU VFX 2011 Assignment #3
 - <https://www.youtube.com/playlist?list=PLDBC5F12DD815090D>
- NTU VFX 2012 Assignment #3
 - <https://www.youtube.com/playlist?list=PLiioR5ew-ZqsFuya7pwt9Y0eopsR8Kpml>
- NTU VFX 2013 Assignment #3
 - https://www.youtube.com/playlist?list=PLiioR5ew-Zqs7_Q72a8AMQPaJ77LZSUyW

Reference

- Blender

- Official website

- <http://www.blender.org/>

- 2.70 release log

- http://wiki.blender.org/index.php/Dev:Ref/Release_Notes/2.70

- 2.70 New Features

- <http://www.blender.org/features/2-70/>

- Tutorial

- <http://www.blender.org/support/tutorials/>

- 2014 Demo

- <https://www.youtube.com/watch?v=EJed22ShxLc>

Reference

- Blender

- Blender 2.70 Camera Tracking

- <http://vimeo.com/87658924>

- <http://www.youtube.com/watch?v=mQY0EtYniqA>

- Match Moving Tutorial in Blender

- <https://www.youtube.com/watch?v=GzL33T1CNgY>

- Basic video tutorial

- https://www.youtube.com/results?search_query=blender+tutorial+beginner

- Basic video tutorial for Blender and Voodoo [Older vision]

- <http://www.youtube.com/watch?v=kPZbtKQ1a4g>

- <http://www.youtube.com/watch?v=sO4kmT-n3IU>

Reference

- Voodoo
 - Python problem between Voodoo and Blender appear again for different versions!!!!
 - Voodoo camera Import for v2.68 ~ v2.70 (io_import_voodoo_camera_fix.py)
<http://ppt.cc/BNkt>
Voodoo document website
<http://0rz.tw/c2ceR>
 - CINEMA 4D + VOODOO – TUTORIAL
<http://www.youtube.com/watch?v=JWIW7ay0yi4>

Reference

- Other Resources
 - K-Lite Codec Pack
 - Mega, Full, Standard and Basic
 - http://www.codecguide.com/download_kl.htm
 - Video Editing Tools
 - 威力導演、繪聲繪影、 ...
 - Sony Vegas, Adobe After Effects, Premiere, ...
 - Sound/Music Editing Tools
 - Adobe Audition (original cooledit), Goldwave, ...

*Thank you
for your attention!*



Step 4-1 : Adjust Rendering Property



To avoid rendering the feature point cloud in your result

Step 4-2 : Adjust Rendering Property

