Animation & 360° Youtube video

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Lab 03

How the brain perceives motion?

Persistence of vision:

https://en.wikipedia.org/wiki/Persistence_of_vision

Early days of Animation:

https://www.youtube.com/watch?v=-66v1ARI0-Q

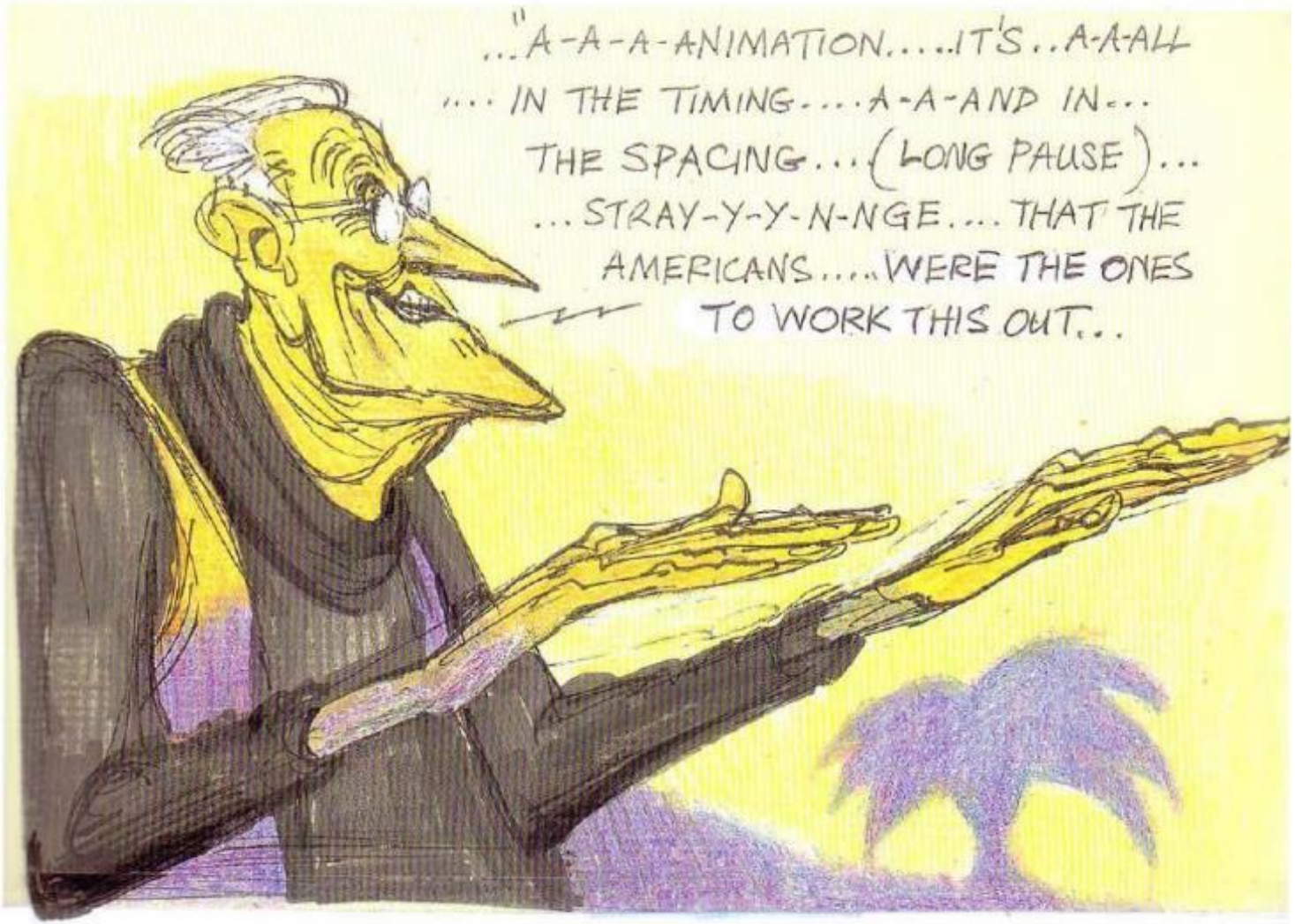
Strobo lamp vfx:

https://www.youtube.com/watch?v=OtxlQTmx1LE

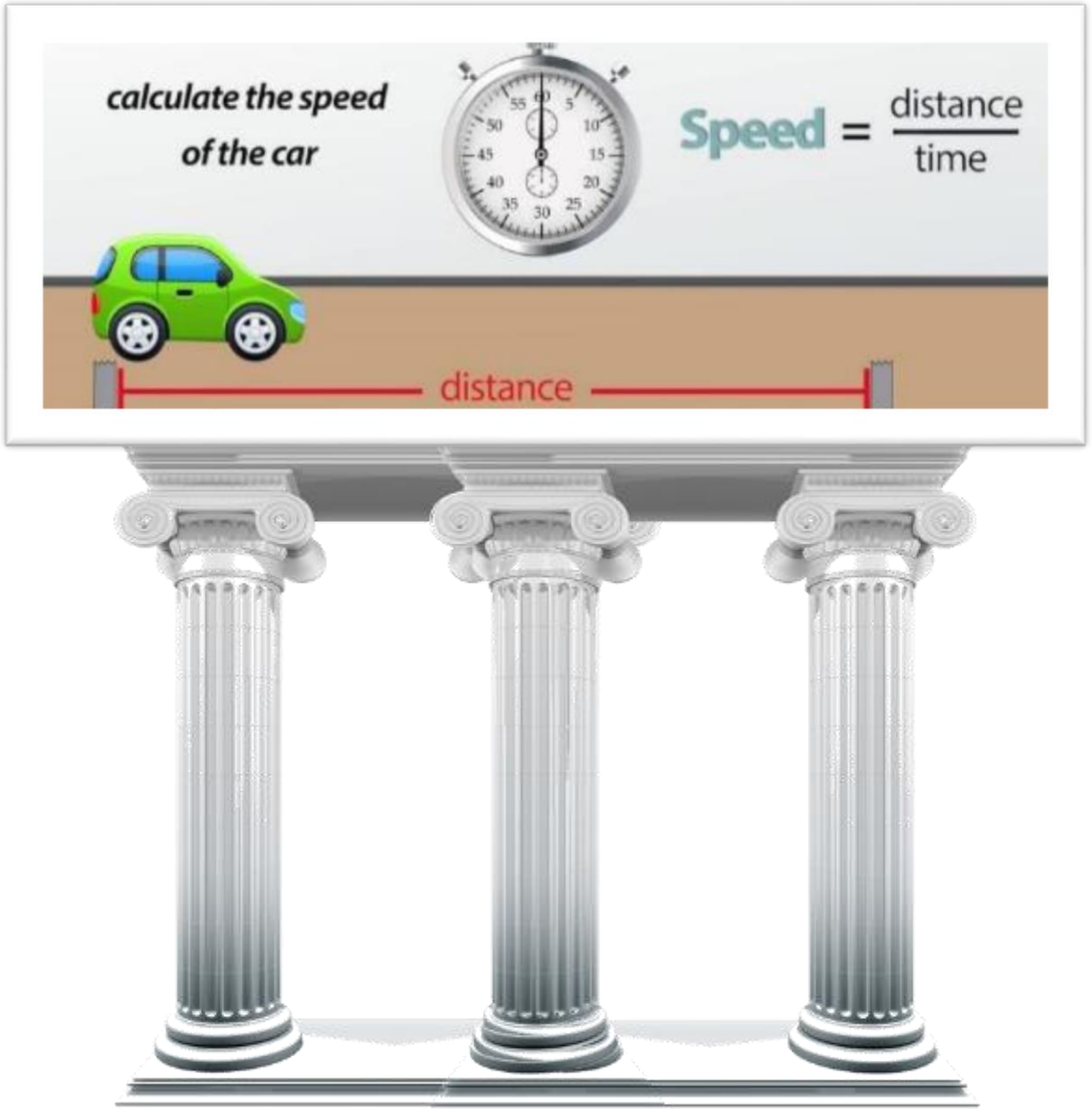
Zootrope:

https://www.youtube.com/watch?v=5khDGKGv088

Time and Space



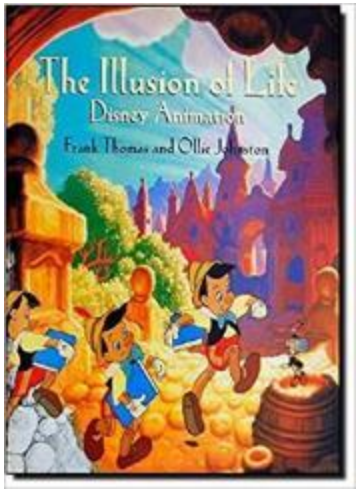
Time and Space



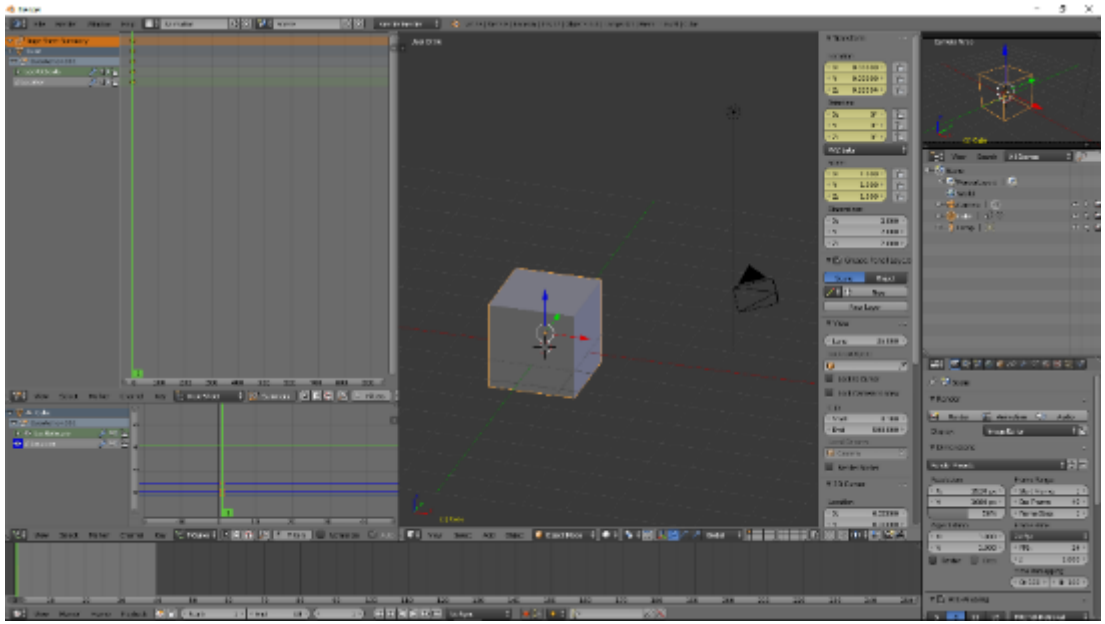
References books:

- **The Animator's Survival Kit**

- **The illusion of life: Disney Animation**

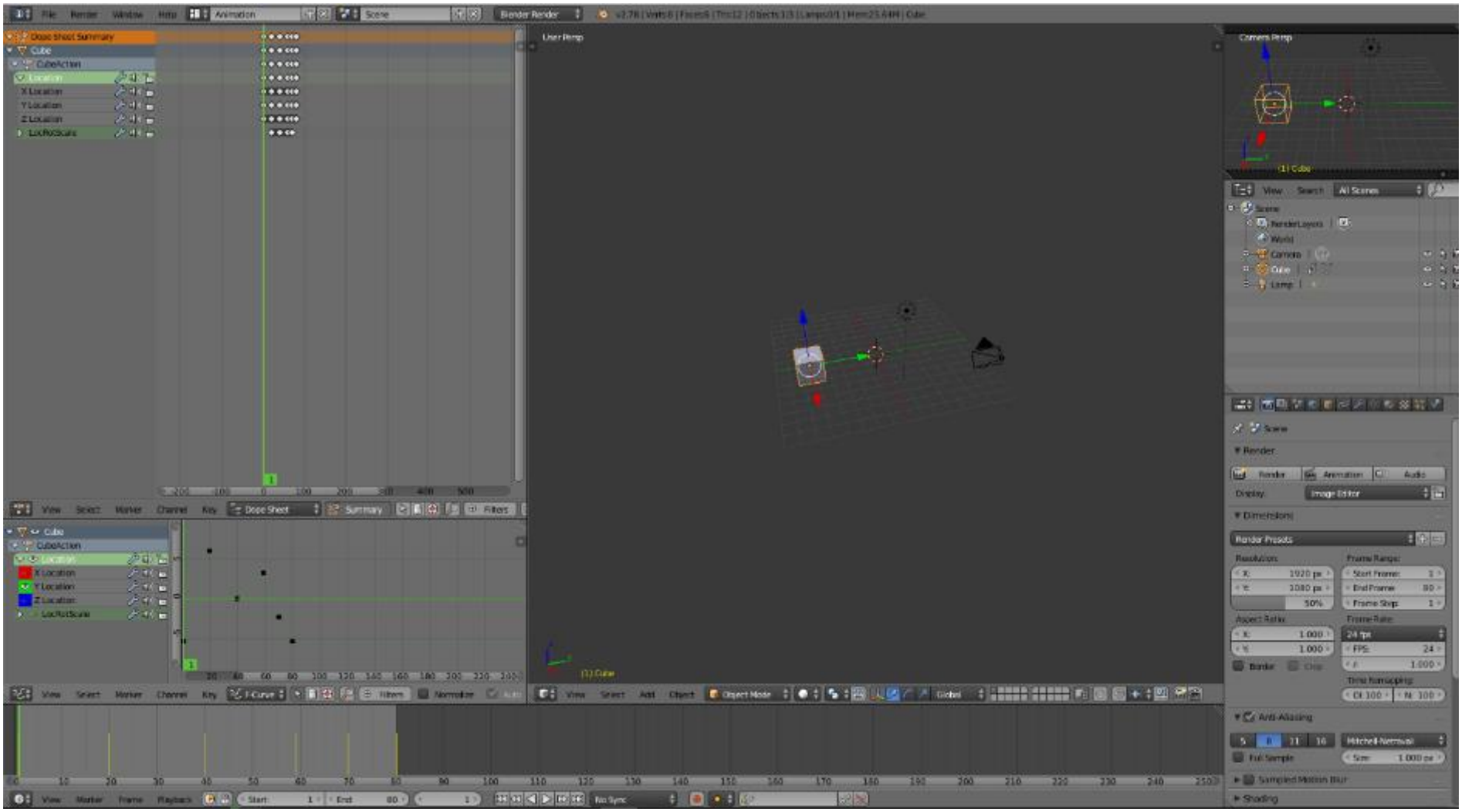


Let’s create our first animated cube



1. Insert the keyframe pressing the key “i” in the 3D view, then select location.
2. Move the cube and timeline to another key frame and repeat step 1.
3. Play ☺

Animation in blender:

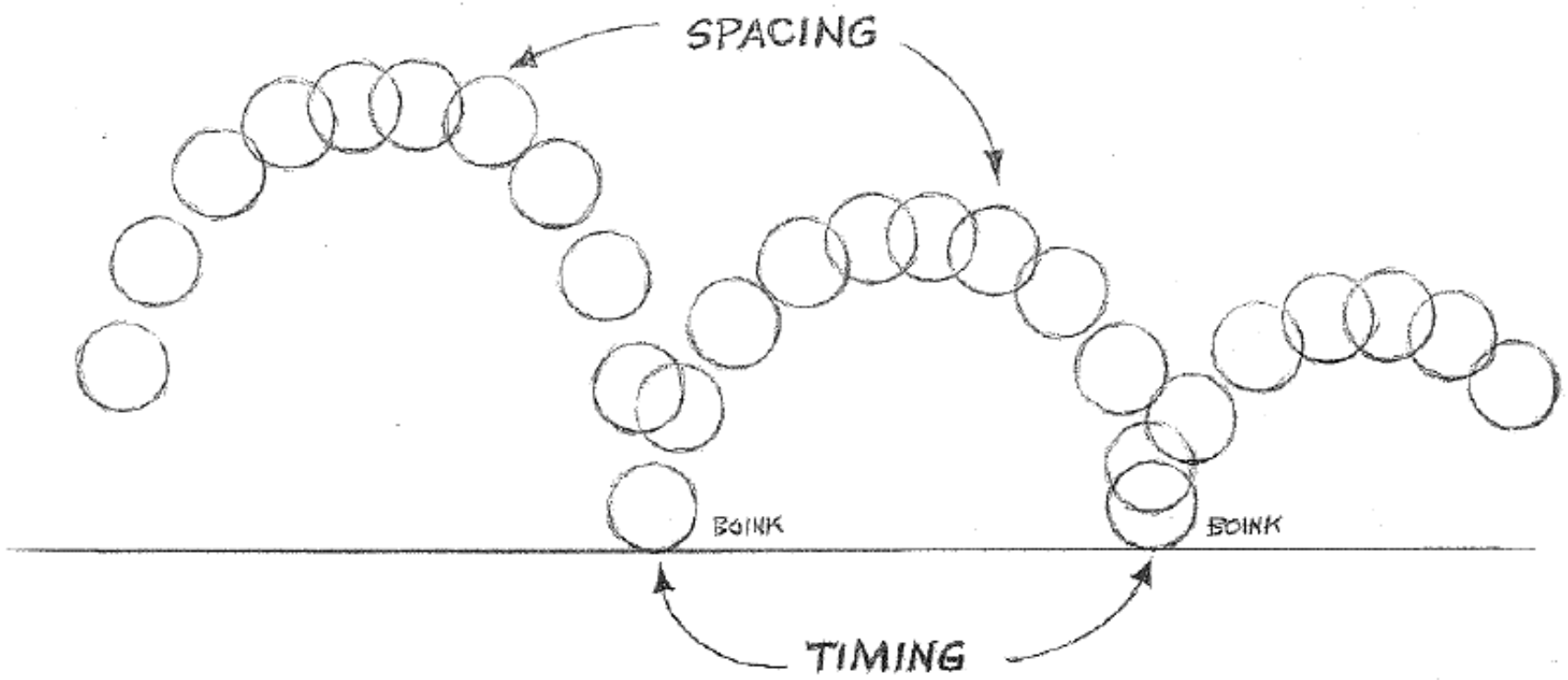


Timeline - Curve - Dopesheet - NLA

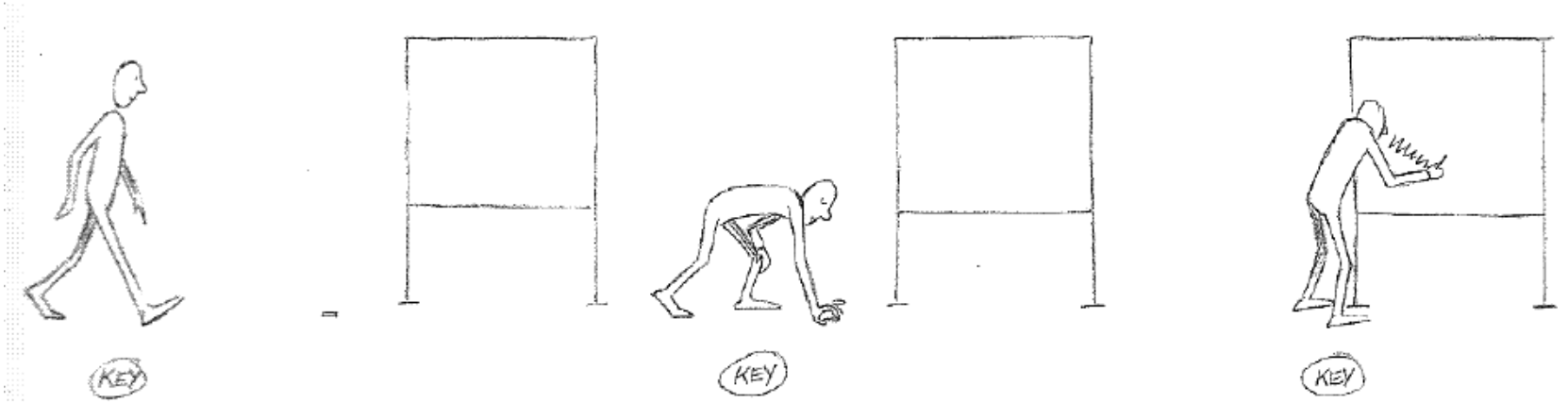
That was really ugly… ☹

Let's create something more interesting…

The bouncing ball:



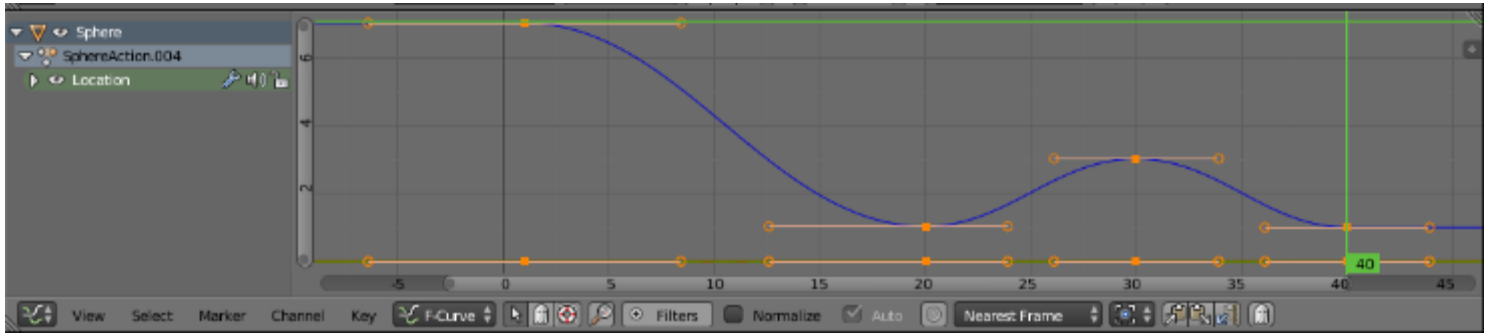
KeyFrame and KeyPose:

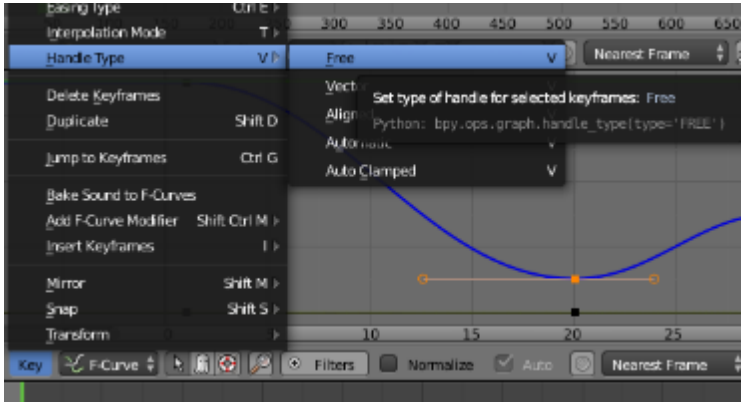


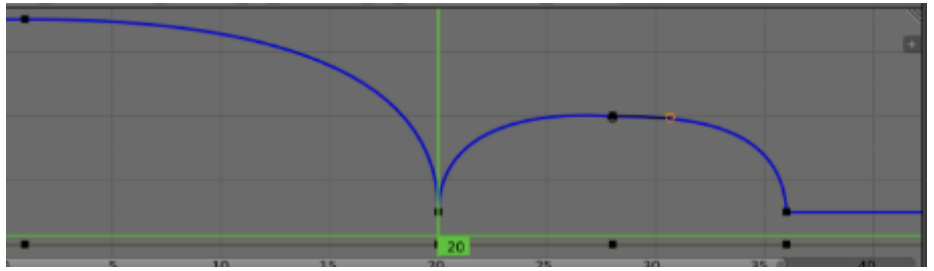
A key frame in animation and filmmaking is a drawing that defines the starting and ending points of any smooth transition.

Add the keyframe and adjust the interpolation changing the animation curves

(make the illusion of bounce)

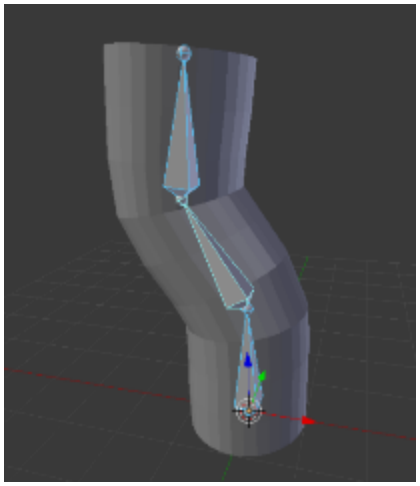


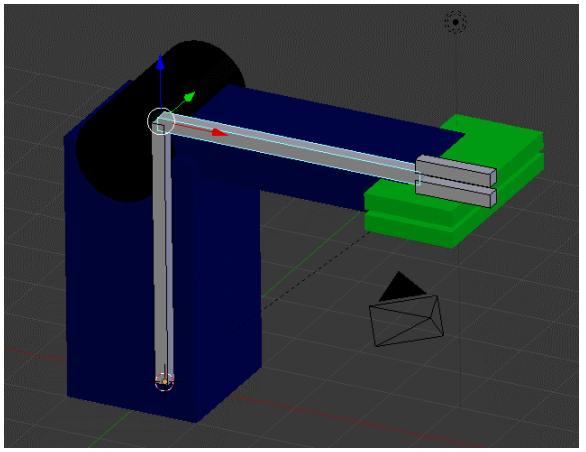




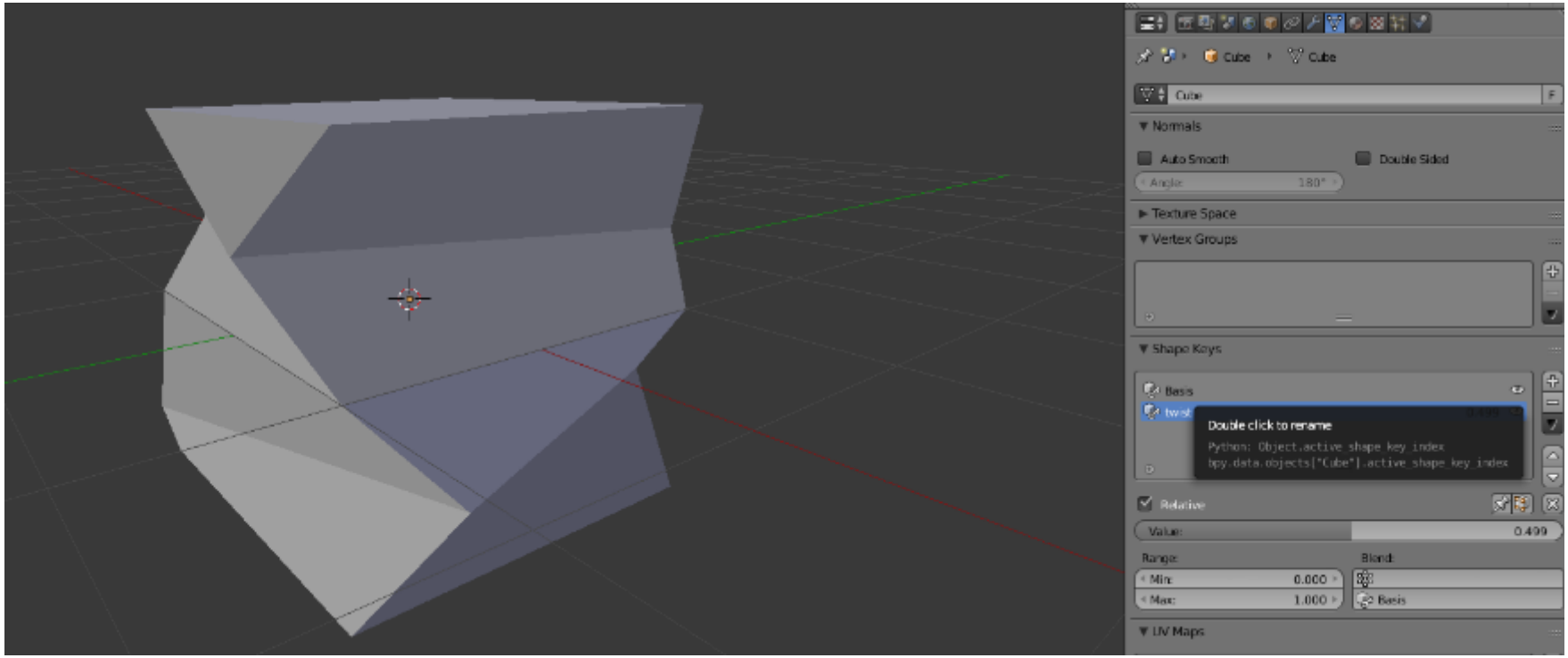
Rigging

- Organic
  - Add a cylinder with the right topology
  - Add a bone
  - Select the object - shift select the bone and then ctrl+p automatic weight
- Inorganic
  - robot arm
  - Add bones, to separate them alt+p
  - Select the arm - select the armature, ctrl+p empty object, assign then the several vertex group with l and assign)





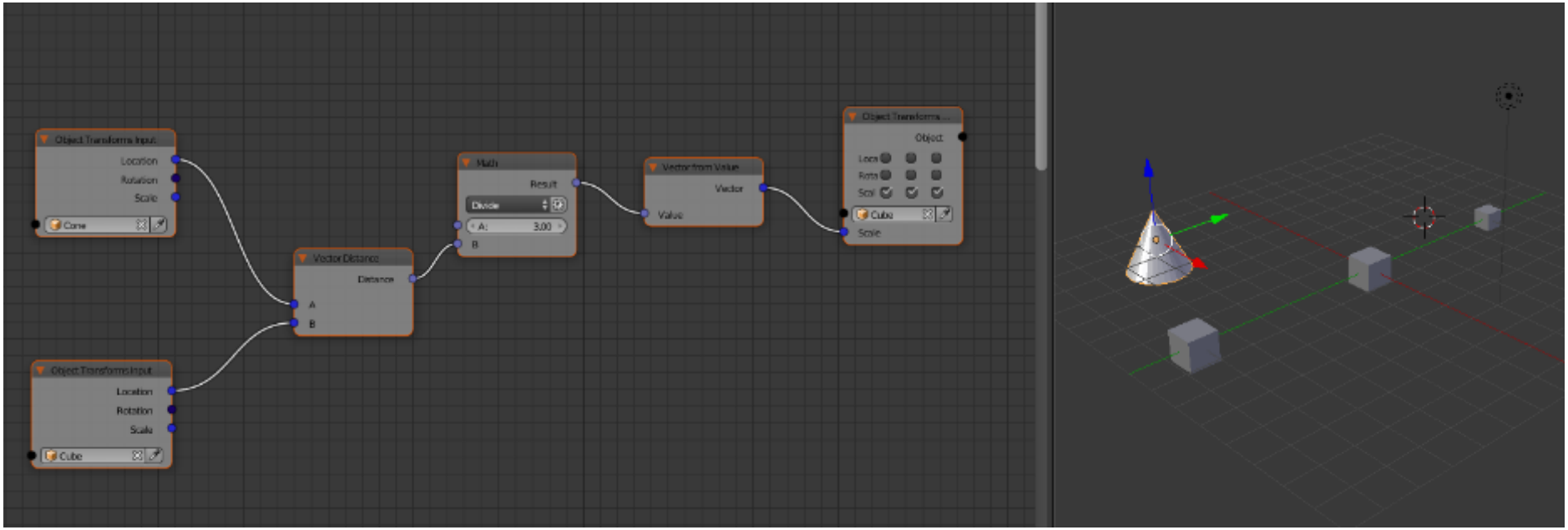
BlendShapes:



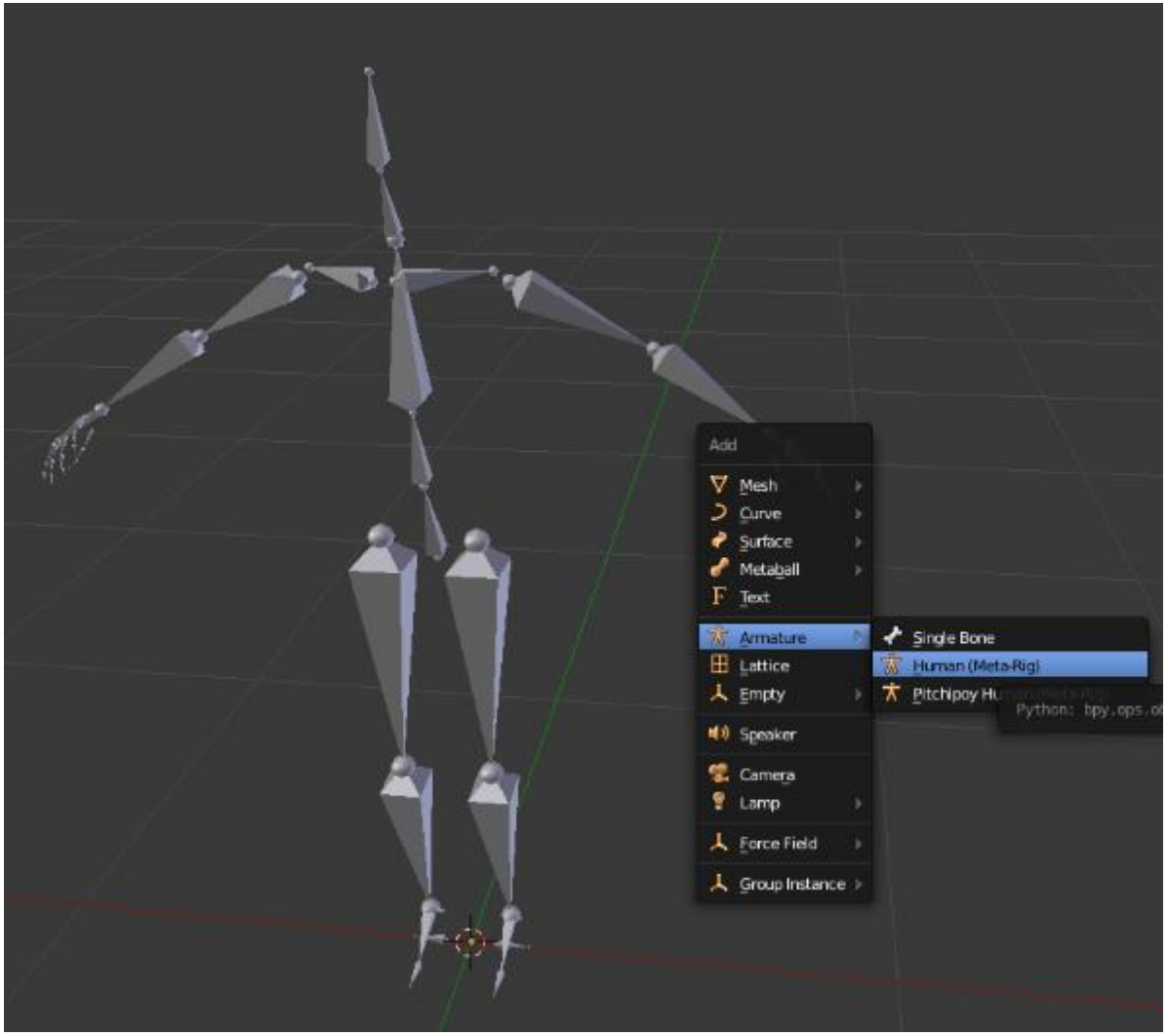
Also the blend shape value could be animated… try to set some keyframes.

Animation node plugin:

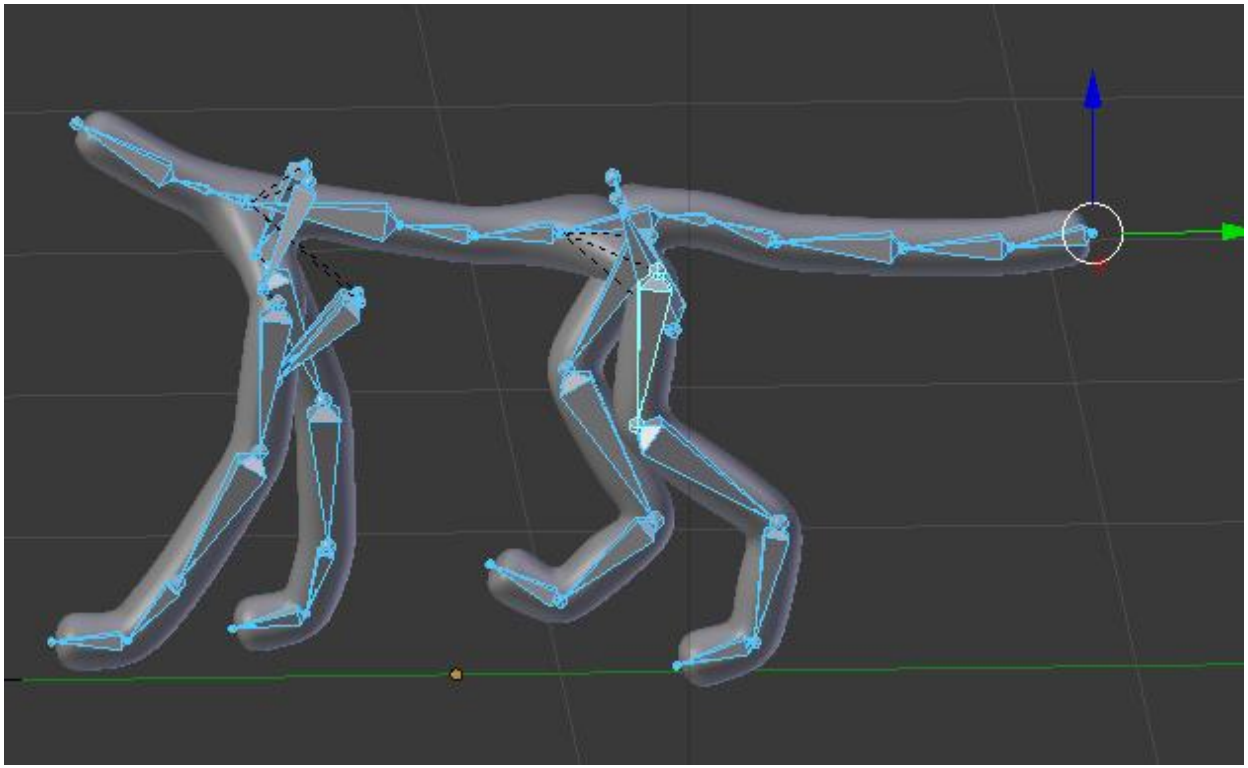
https://github.com/JacquesLucke/animation_nodes



Riggify me:

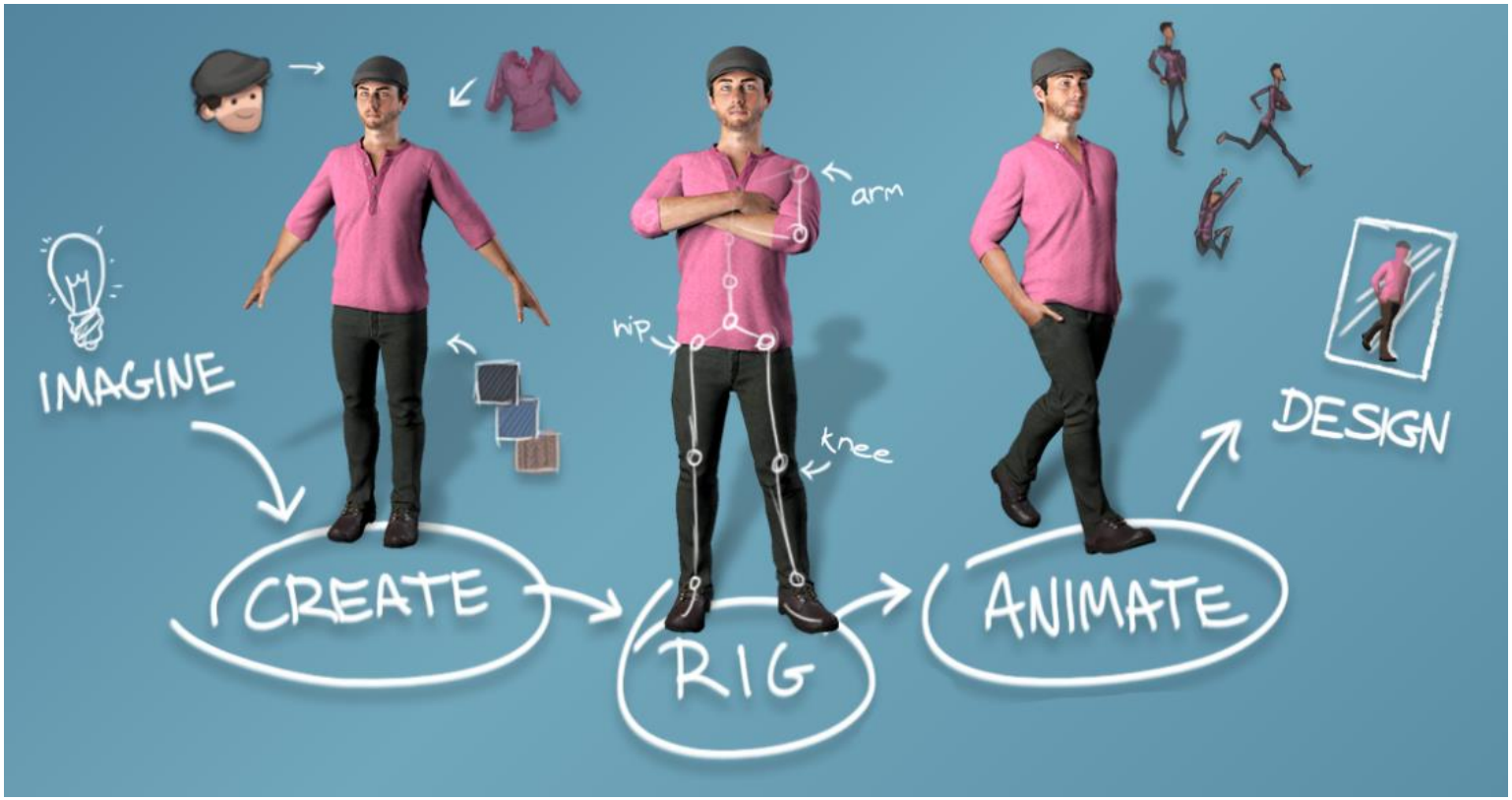

Add
Mesh
Curve
Surface
Metaball
Text
Armature
Lattice
Empty
Speaker
Camera
Lamp
Force Field
Group Instance
Single Bone
Human (Meta-Rig)

Skinify:



Mixamo…

Import -> Autorig -> Animate -> Export .fbx



…today is a good day to create some 360° videos…

What we have learned until now ?

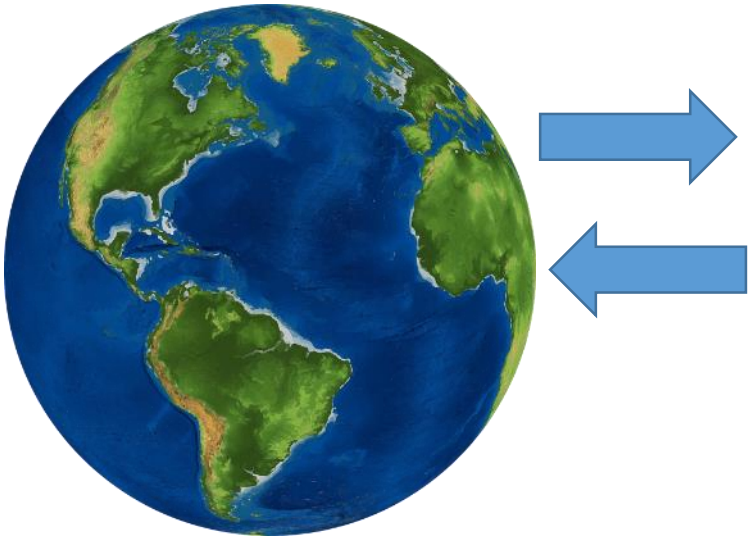
- Several techniques to create a virtual ambient
- How to shade, light and render it
- How to animate objects

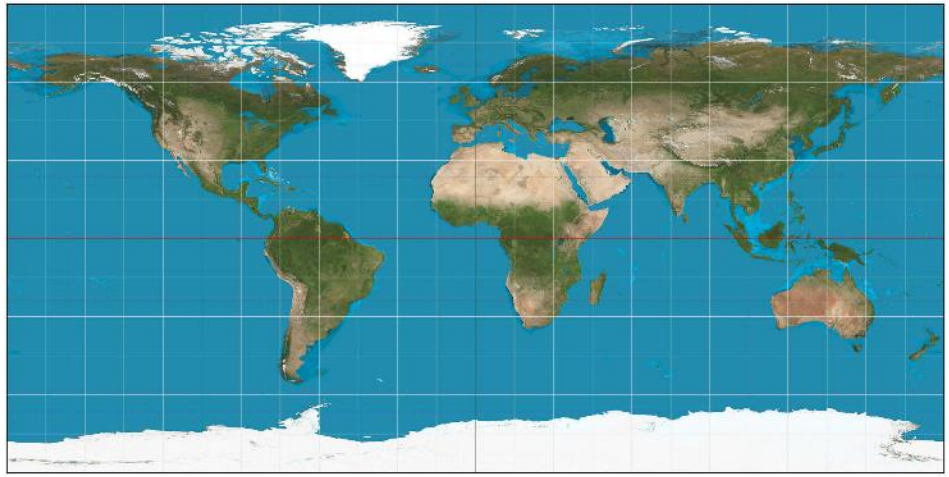
Time to do the last step:

- 360° rendering

How does it work ?

- Equirectangular projection …is a map projection…

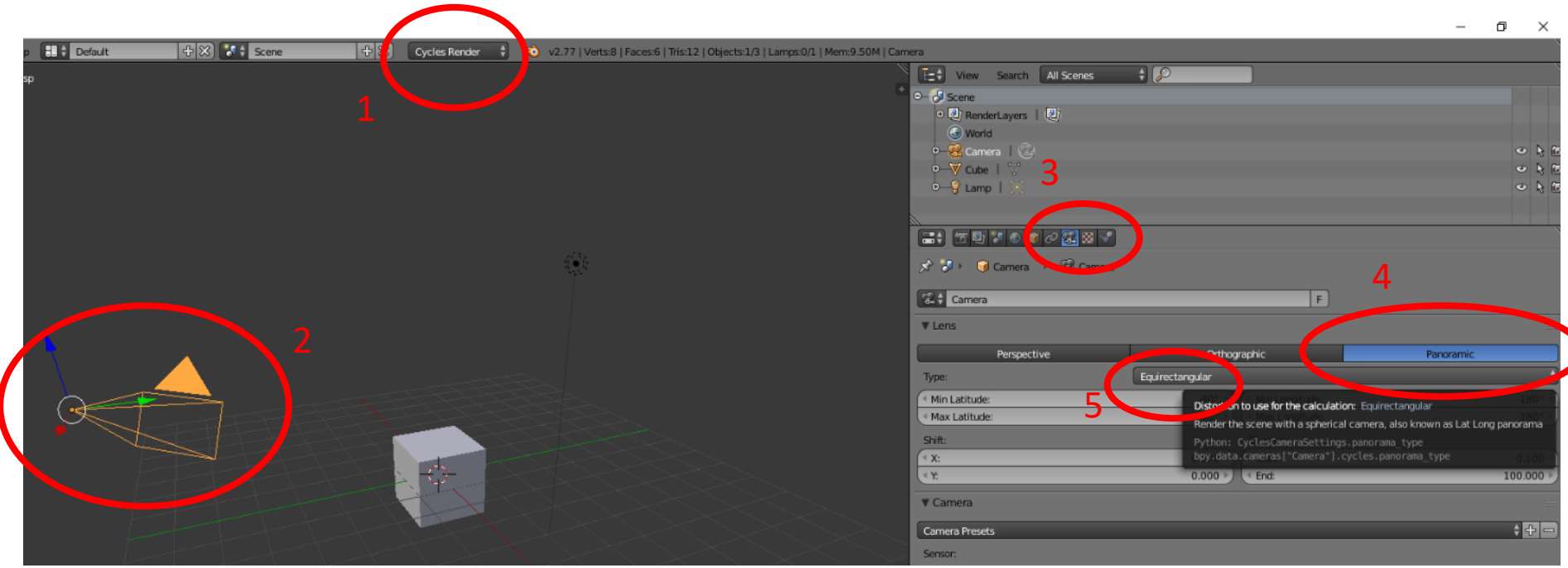




From sphere to plane and back…

360° Rendering in Blender Cycles

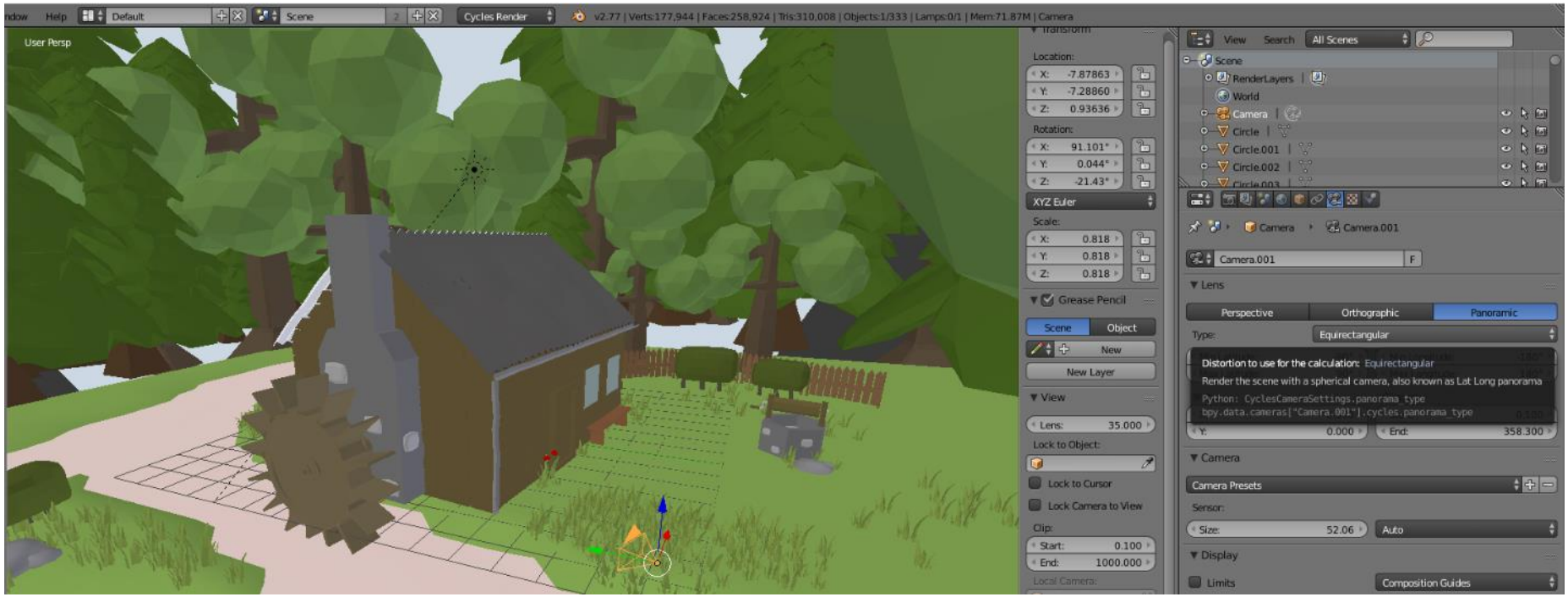
- This **incredibly hard task** is just few button click far ☺



1. Select Cycles as rendering Engine
2. Select the camera in the scene (right mouse click)
3. Select the camera tab in the property view
4. Select Panoramic for Lens
5. Select Equirectangular as Type

MEMS (gyroscope) to track head movements and display the right portion of the sphere textured

Let’s try with a default scene:



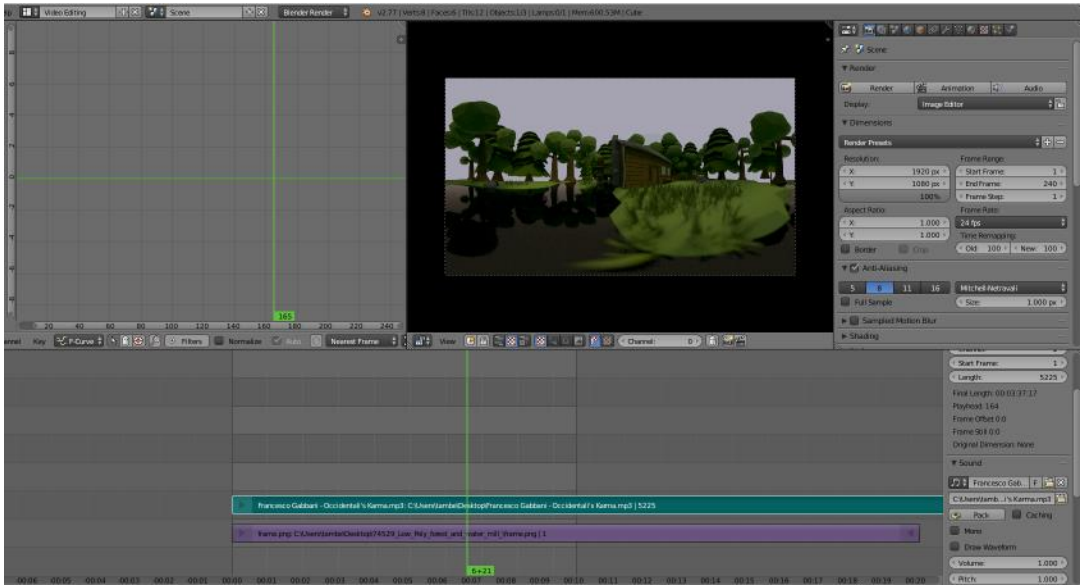
You can use your own, or this one (LP002.blend in the .zip file).
This is a still scene, so the best approach is to render a single frame, then create a video using just this single frame.
If the scene is animated then you should proceed rendering all the animation’s frames

Blender in video editing mode

Blender could be used to create a video starting from :

- A single frame
- Several frames

It could also be used to add sounds at a very specific frame (like every video editing software)



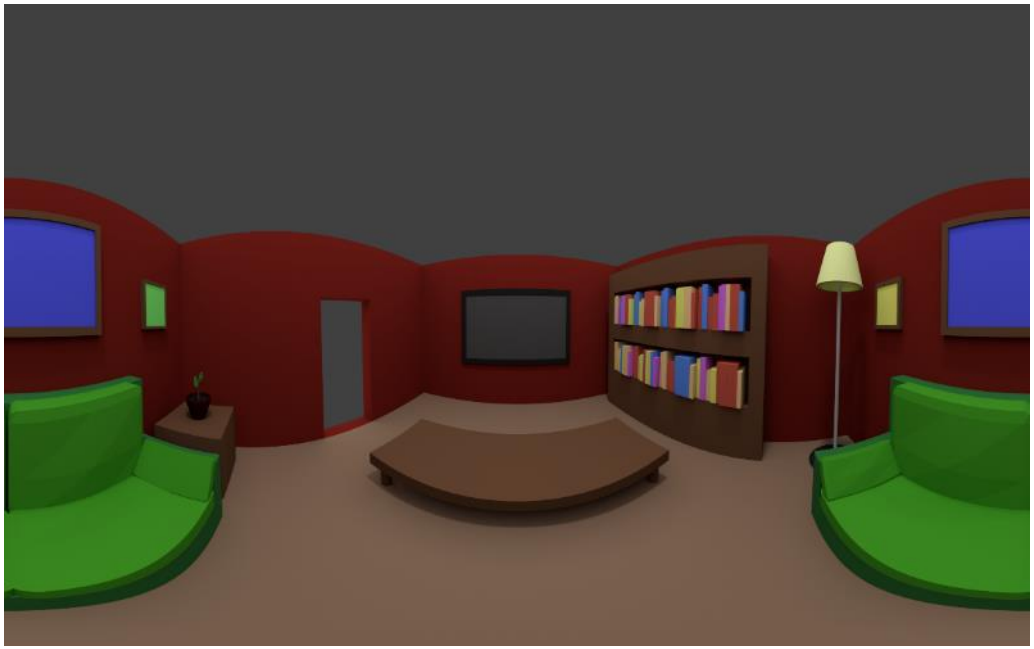
Upload 360° videos on YouTube

Uploaded videos will be explorable using the mouse on PC or Mac and by turning your head using your smartphone inside a Google Cardboard!

Injecting Metadata to your videos

YouTube use special **metadata** to recognize a 360° video and instantiate its “**VR-capable” video player**.

If the video does not contain this information you will visualize it as a regular video obtaining this weird look.



Injecting Metadata to your videos
(the easy way) – 1/2

YouTube provides a tool to automatically inject required metadata to your videos.

Here is the link:

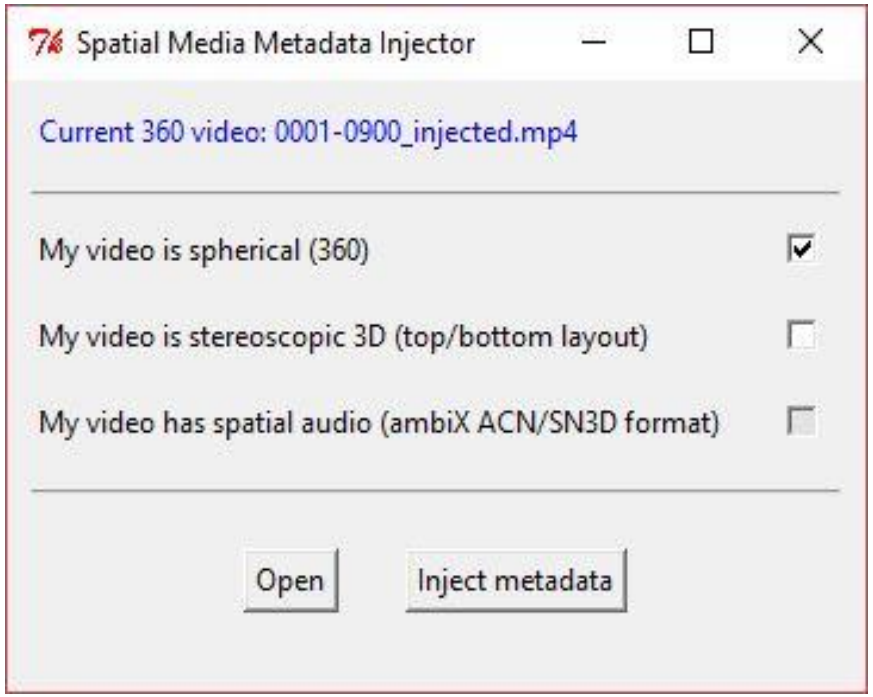
https://support.google.com/youtube/answer/6178631?hl=it&ref_topic=2888648

You may download this files now. You should also find a copy of them in todays lesson zip file.

Injecting Metadata to your videos
(the easy way) – 2/2

NOTE: Your video should be a .mp4 or a .mov usually exporting .mp4 files with H264 codec from blender is a good way to avoid any issue

- Open the spatial Media Metadata Injector
- Set your video as spherical (360) as shown in the picture.
- Click on Open and select your video file
- Click on Inject metadata, you will be asked for a place to save your injected video in.



Injecting Metadata to your videos
(the hard way) – 1/2

As far as we know, this is the only way YouTube provides to Linux users to inject required metadata to your videos

REQUIREMENTS: you will need to install python 2.7 (no python 3.X) for this to work. (on Ubuntu/Mint/Debian 'sudo apt-get install python' should install everything for you.)

- Download repository from: https://github.com/google/spatial-media
- Unzip the file.
- Open a terminal and browse to the unzipped directory.

Injecting Metadata to your videos
(the hard way) – 2/2

- ‘cd’ to the root of the unzipped folder.
- run: python spatialmedia -i --stereo=none
- /path/to/input.mp4 /path/to/output.mp4

[Info on command: python spatialmedia –h]

If you wish you may also try to compile and run a graphical version of this tool too, you will need to install pyinstaller, the easiest way to do this is to run:

- pip install pyinstaller

Then run:

- pyinstaller spatial_media_metadata_injector.spec

The final result: