Blender. Animations

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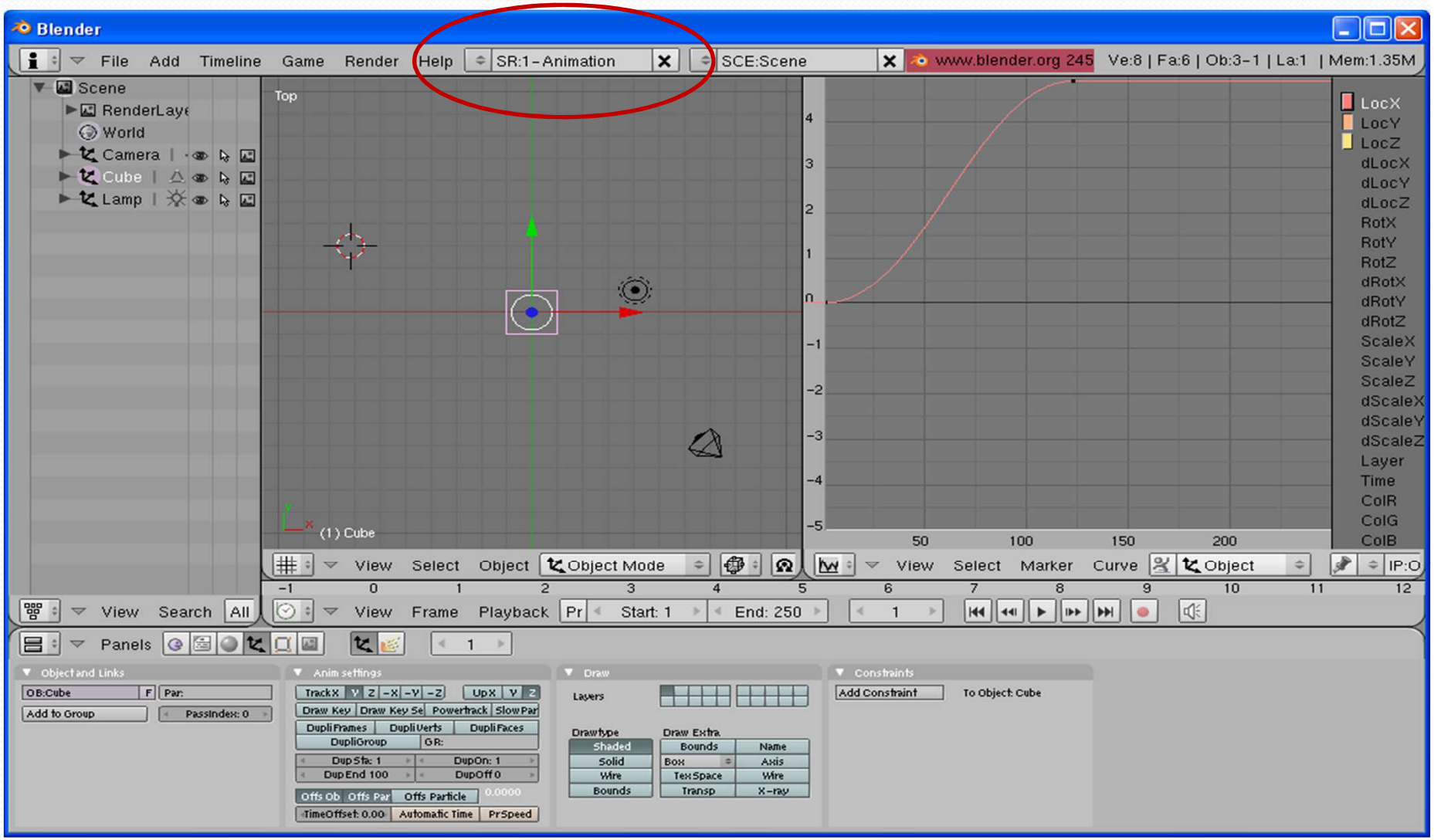
Animations


Blender
File Add Timeline Game Render Help SR:1-Animation SCE:Scene www.blender.org 245 Ve:8 | Fa:6 | Ob:3-1 | La:1 | Mem:1.35M
Scene
RenderLaye
World
Camera
Cube
Lamp
Top
(1) Cube
View Select Object Object Mode
View Search All
View Frame Playback Pr Start: 1 End: 250
Panels
LocX
LocY
LocZ
dLocX
dLocY
dLocZ
RotX
RotY
RotZ
dRotX
dRotY
dRotZ
ScaleX
ScaleY
ScaleZ
dScaleX
dScaleY
dScaleZ
Layer
Time
ColR
ColG
ColB
View Select Marker Curve Object
Object and Links
Anim settings
Draw
Constraints
Add Constraint
To Object: Cube

Timeline window

- Represents all the frames of the animation
  - The horizontal axis is time (in frame units)
  - Green line: current frame
- **View → show seconds** to show in sec units
- Select a given frame: **LMB**

Keyframe animation

- An object might have several keys
- Key = (frame, attribute, value)
- Example: (240, Rotation angle around Z , 180 degrees)
- Many properties support animation:
  - GT (position, orientation, scale…)
  - Layer (showing/hiding an object during the animation)
  - Material
  - …

Adding Keyframes - FMI

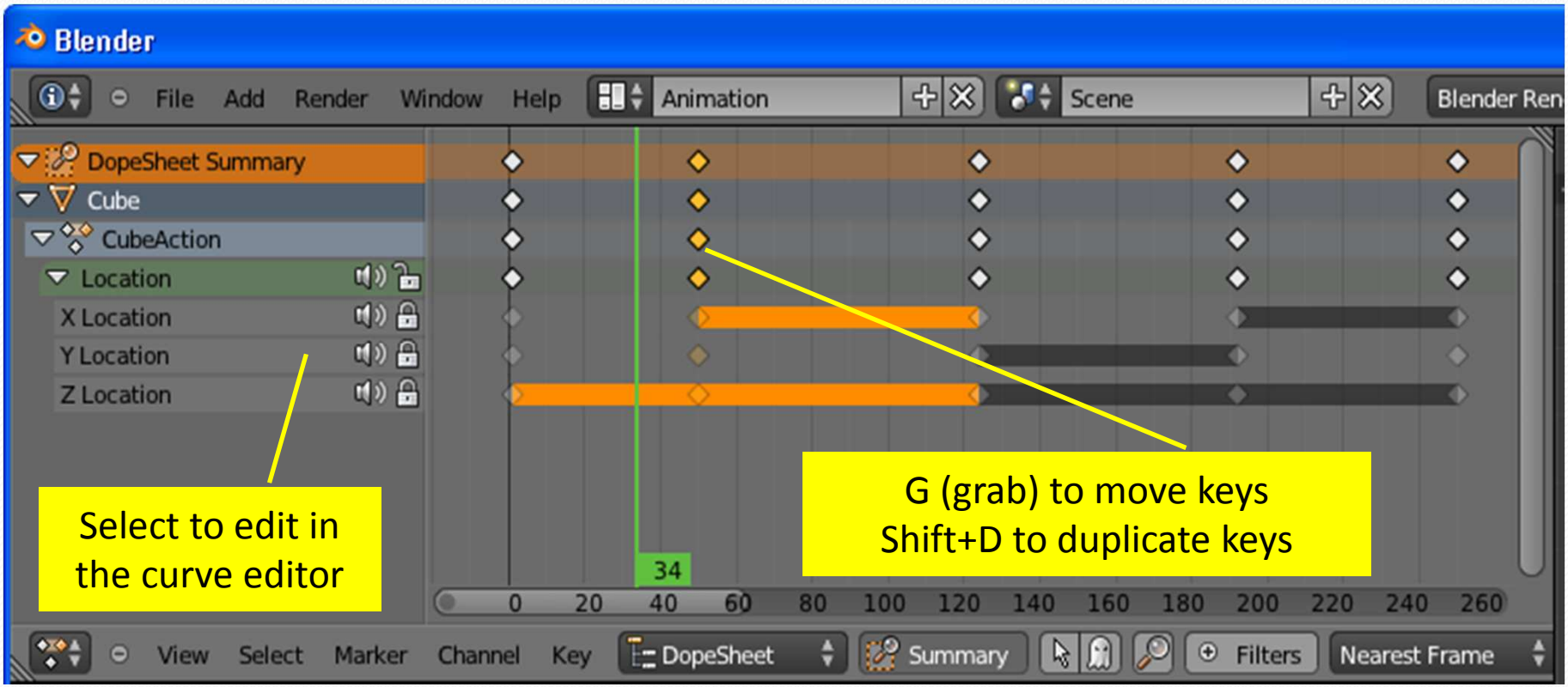
- Adding a keyframe:
  - Select the **frame**
  - Select the object and **move** it (or edit the desired property)
  - Insert a new keyframe pressing **I** (on the 3D view)
  - Choose the property (eg. Rot) for the key
- Note: once the object has a key, any change in the associated property will be lost when changing to another frame (unless we rewrite the key)
- Example: a cube following a quad path

Playing animations

- Play (in 3D views)
  - Play in the current window: **Alt-A**
  - Play in all the windows: **Shilf-Alt-A**
- Render: press ANIM botom

DopeSheet

Shows the animated properties (location…) and their keys

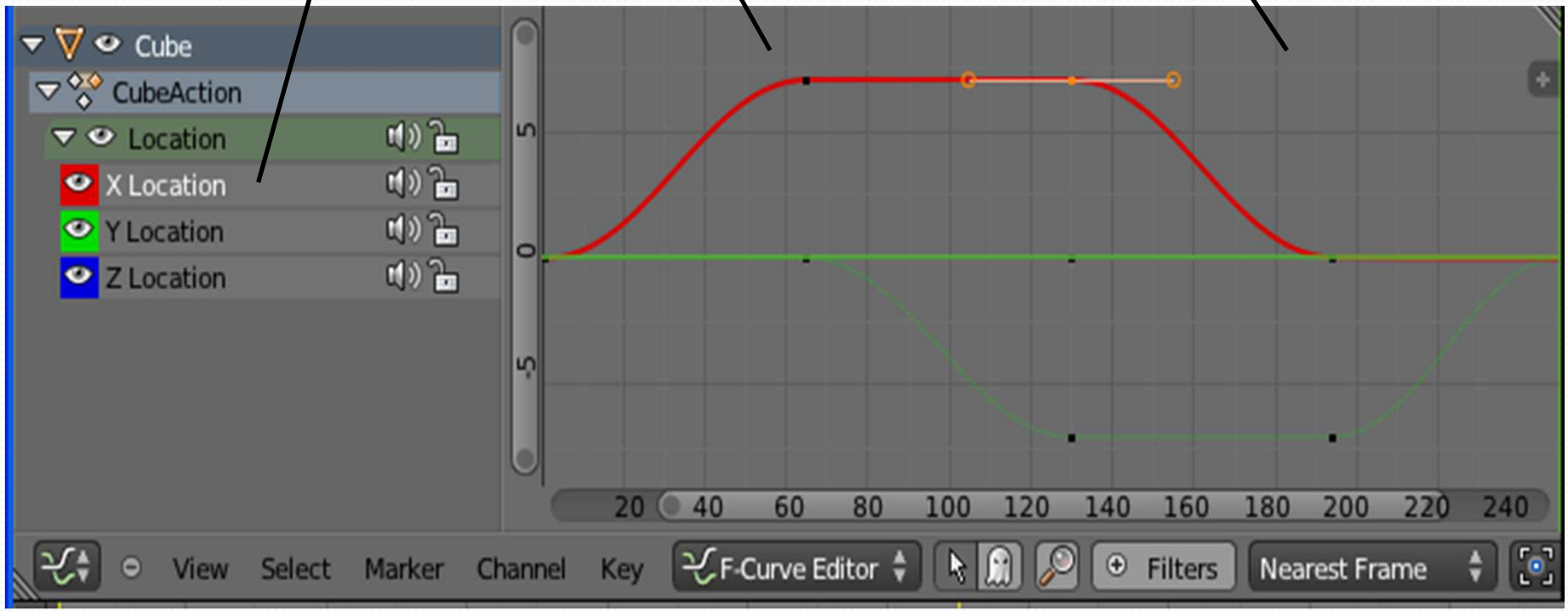


Curve editor

Select to show the curve

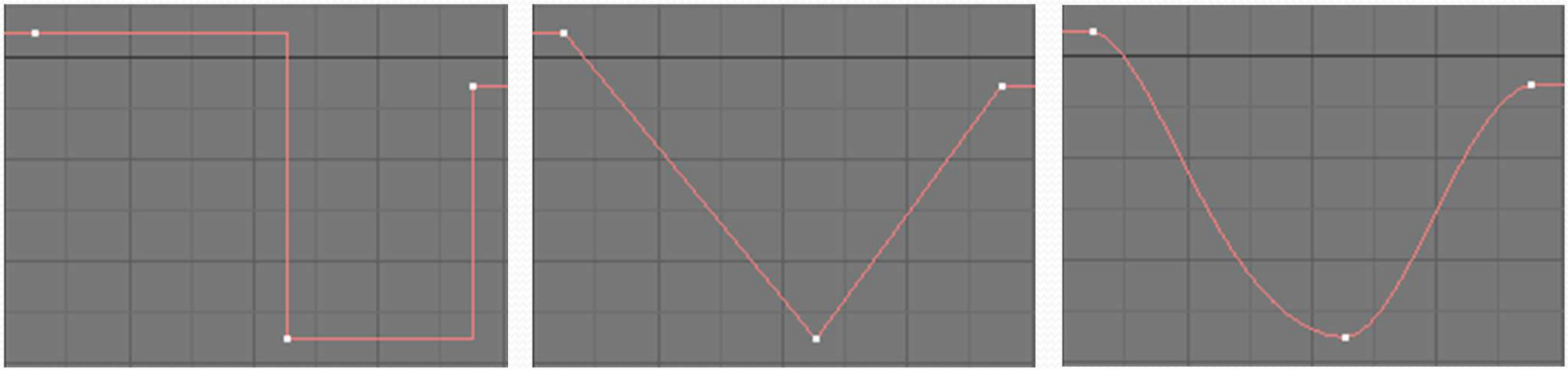
RMB to grab
LMB to release

Shift + MMB to pan
Ctrl + MMB to zoom



Curve editor – Key interpolation

1. Select key(s)
2. Key → Interpolation Mode → Constant/Linear/Bézier



Location, rotation, scale

- You can assume that Blender applies GT in the following order:
  - Scale (w.r.t. the local axes)
  - Rotation (w.r.t. the local axes)
  - Translation (w.r.t global axes)

- How to make the camera rotate around an object?

Dummies (empties)

- Dummy (empty): empty object (with no mesh) that facilitates the animation of other objects.
- Use:
  - Create empty: **Add→Empty→ Arrows**
  - Define the animation for the empty
  - Select object to animate (e.g. camera) using **RMB**
  - Add the empty object to the selection (**Shift-RMB**)
  - Make the empty be the parent of the object: **Ctrl-P** (Object→Parent → Object)
- Rotations (and scales) are relative to the dummy (as if a rigid bar was connecting them)

Examples

- Rotate a camera around an object (with uniform speed)
- Animate a clock's pendulum
- Animate a solar system with Sun, Earth and Moon.

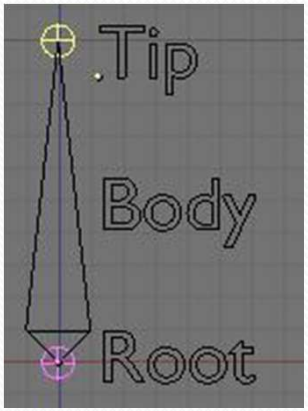
Paths

- Creating a path:
  - Add→Curve→Path
  - Add points to the path: **Ctrl-LMB** or **E**(in edit mode)
- Make an object follow a path:
  - Select the object (RMB)
  - Add path to the selection (Shift-RMB)
  - **Ctrl-P → Follow Path**

Constraints

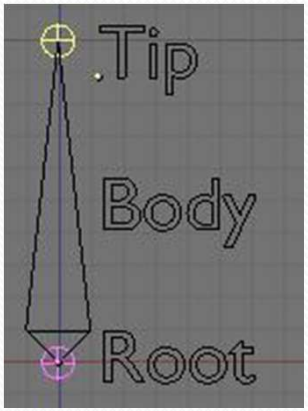
- Constrains can be used to limit or control the location, scale and orientation values of an animated object.
- Example: let the camera aim to a moving object
  - Select the target object (RMB)
  - Add the Camera to the selection (Shift-RMB)
  - Ctrl-Shift-C (Add Constraint) → **Track to**
  - Contraint panel: **To: -Z, Up: Y**

Armatures



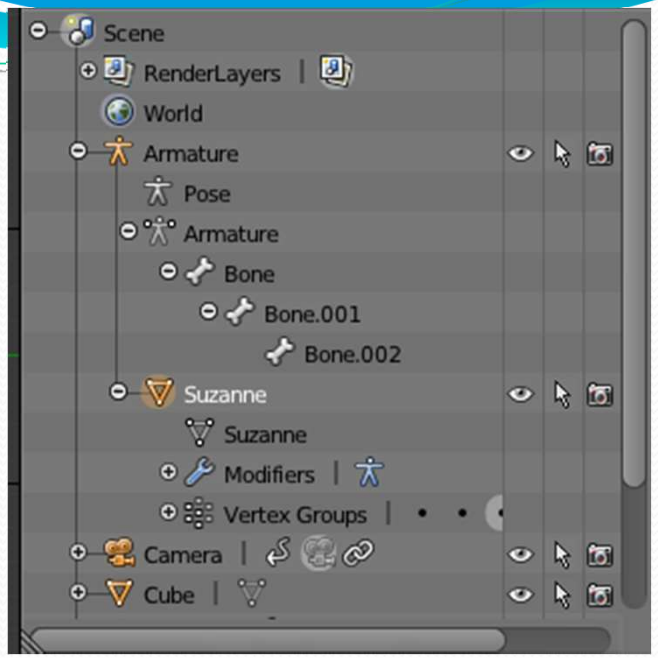
- Armature = Skeleton
- Adding armatures: **Add → Armature**
- Adding bones:
  - **Add → Bone**
  - (better) Select a tip and press **E** (extrude)
- **Edit mode→** for editing the **skeleton**
- **Pose mode→** for editing the **pose**

Armatures



- Forward kinematics : Mode Pose + rotations
- Inverse kinematics (IK solving):
  - Mode Pose
  - Select bone
  - **SHIFT+I**, "To New Empty Object" . This would create an empty for controlling the target position of the chain.

Skinning

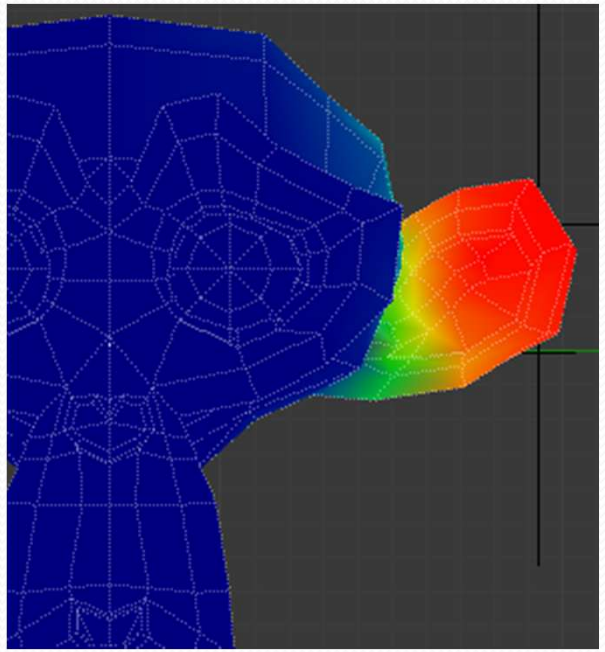


Associating a mesh with an armature:

- Select the mesh (RMB)
- Add armature to the selection (Shift-RMB)
- **Ctrl-P → With automatic weights**

See the region of influence of each bone:

- Select Mesh
- Set mode "Weight paint"
- Select each **vertex group**



Adjusting weights:

- Select mesh & vertex group
- **Weight Paint** mode
- Paint to increase/decrease the weight