CS7029 Animation Project

Part 3: Animation

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questions from last time (textures)

- i tried to demo setting up material nodes and it looked odd
  - make sure you are in the Cycles renderer first!

- you can keyframe [almost] anything
  - hover the mouse over a field/slider/button and press **i**
  - e.g. changing material colour over time

    [must be in **rendered** view mode to preview]

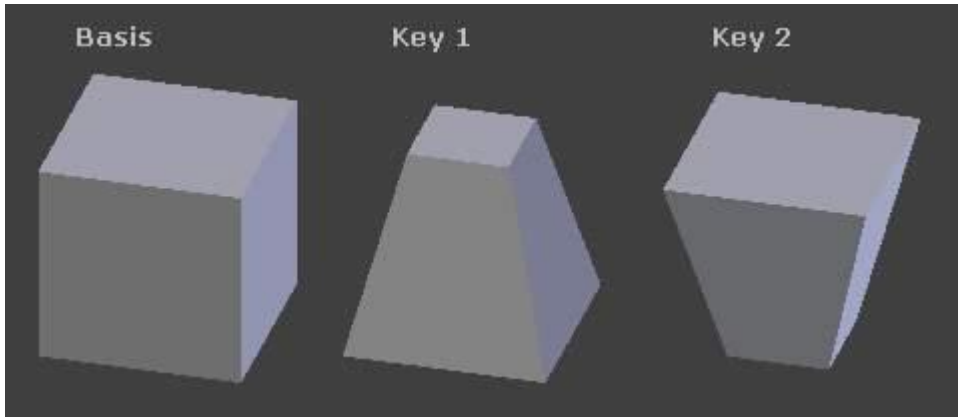
- dissolving / blending 2 textures
  - 2 texture nodes
  - 1 mix node
  - keyframe the ‘mixing’ slider between 0.0 and 1.0

Animation Techniques

	advantages	**limitations**
per-object	easy to do, broad strokes	deforming the mesh
vertex [morph/blend targets, tweening]	faces, gooey things, very big shape changes	rotations, requires same number/order of vertices, large amount of work
skeletal [skinned]	bipeds, vehicles, using with motion capture (mocap)	organic/fluid motions, large amount of work, fiddly
“tweening” functions -- more interesting **interpolations**	fun, cartoony transitions, bounces	
particle systems and physics simulations	fluids, fireworks, sprays	self-contained system
splines and **paths**	interesting cameras, easy	guided, not exact

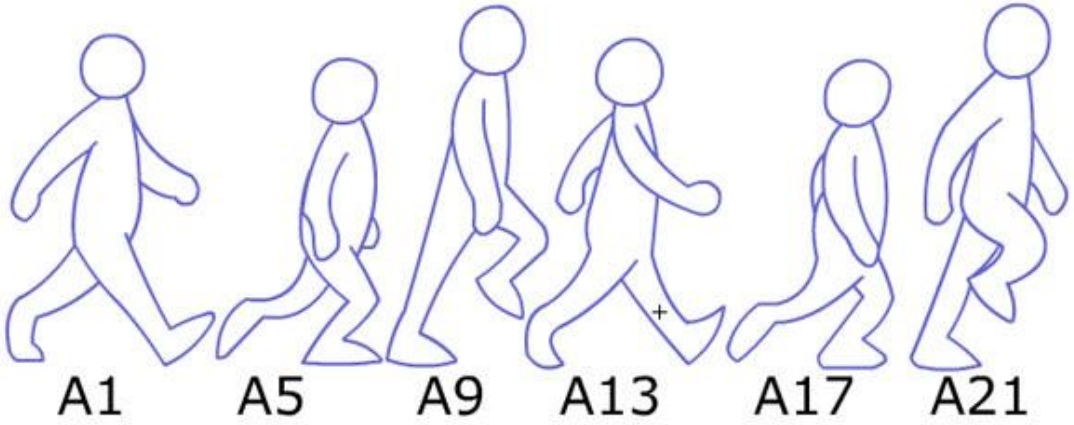
vertex animation

- deforms a mesh / object shape
- create **modified copies** of a mesh at different key-frames
- intermediate frames do **linear interpolation**
- more precise motion e.g. rotations/walk cycles require **more key-frames**
- each modified/keyed copy is called variously:
  - morph target (most common term)
  - blend target
  - blend shape
  - **shape key** (Blender)



“shape keys”

relative [to previous key]



http://ct-files.glos.ac.uk/mwd/mu120/F3/Lec3_6.htm

knight from Quake (id software, 1996)

torch from Quake (id software, 1996)

“shape keys”

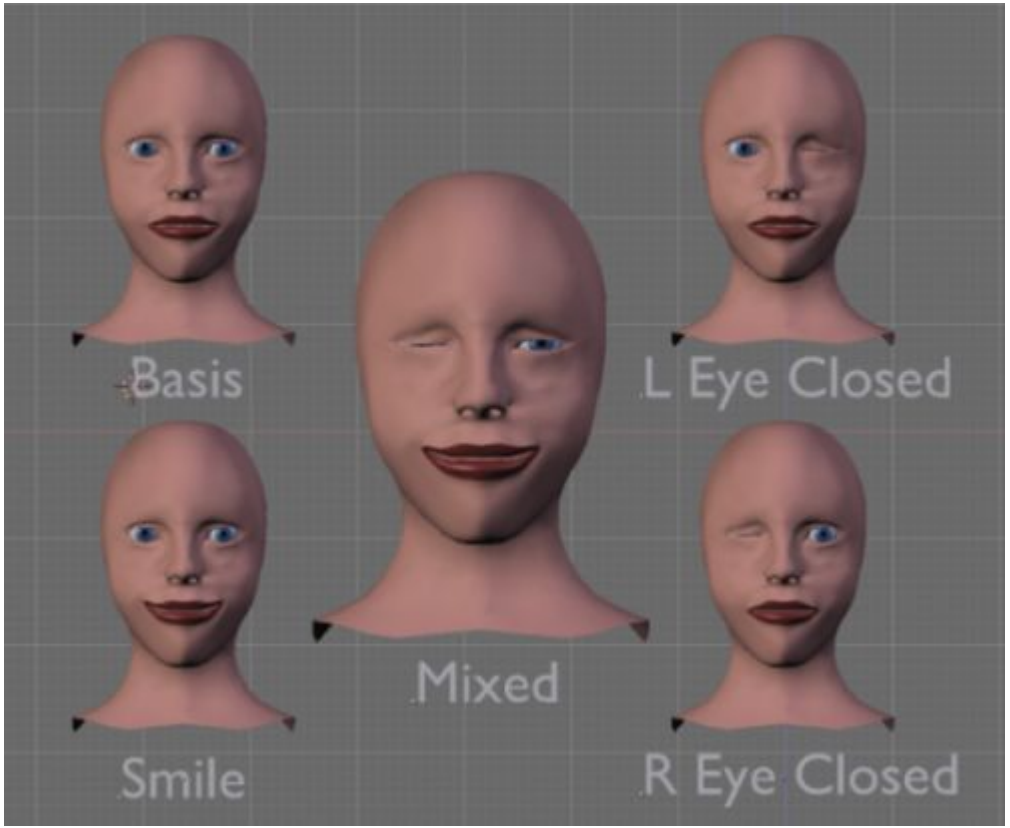
absolute [to base mesh]

create a bunch of separate **targets**

set a **weight** for each target

e.g. 1.0*L Eye, 1.0*R Eye

to make both eyes blink!



how to do it in Blender

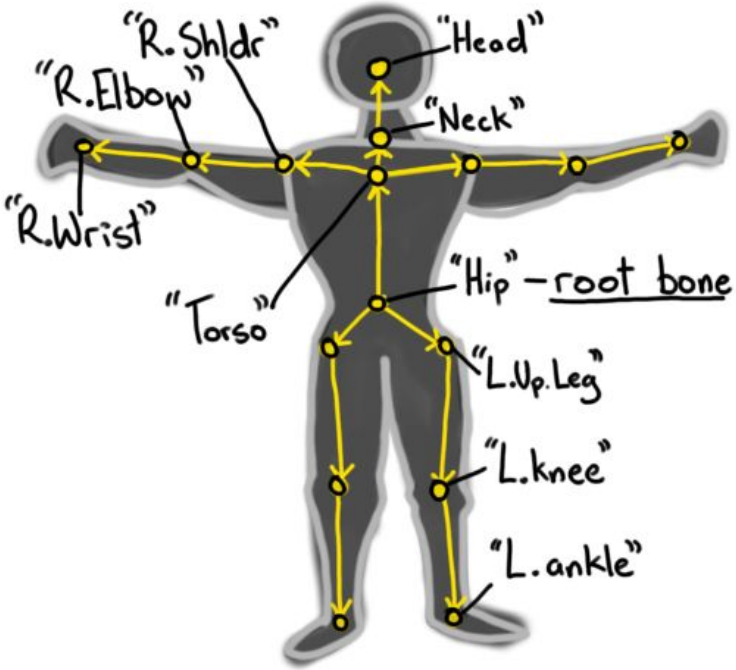
- very easy to do (although tricky user interface)
- this video tutorial is all the summary you need

https://youtu.be/Zijo8ly6pyI

[if i have time i might try to demo this at the end]

skeletal animation

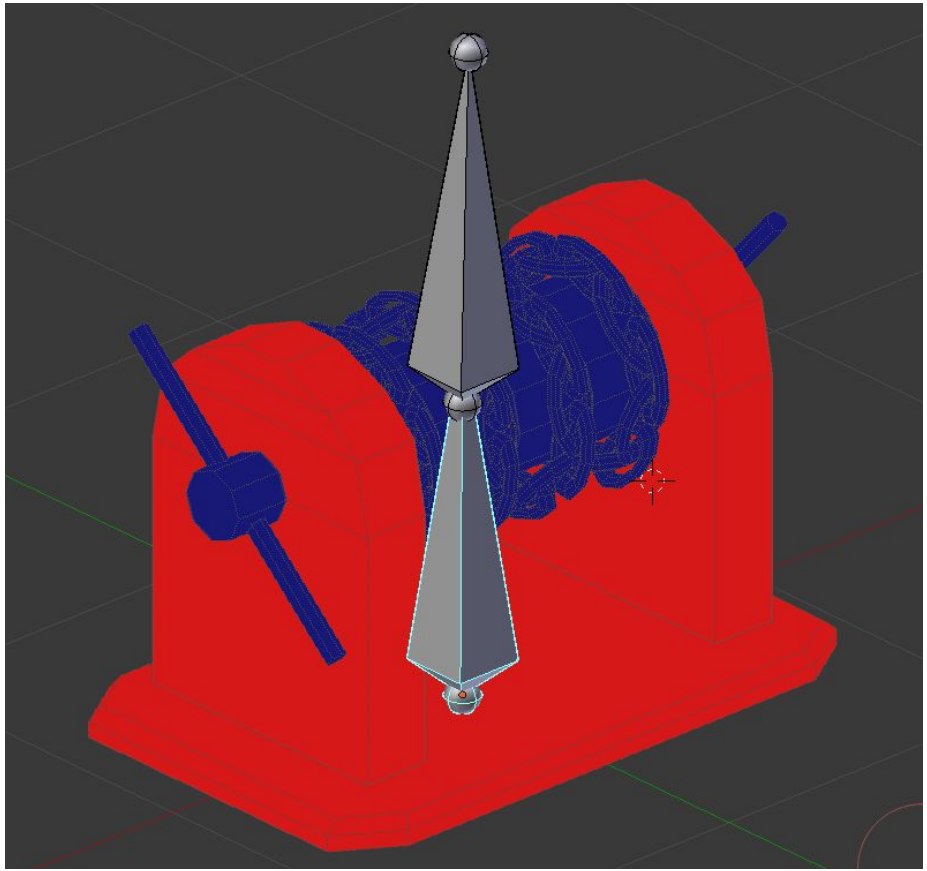
- create a “**skeleton**” of “**bones**”
  - **armature** of **joints** (Blender)
  - a **rig**
- associate every vertex with one or more bones
- **weight painting**
- **pose** the bones [rotate/move/scale] within the object to deform the mesh
- can also put bones in a **hierarchy** (forward or inverse kinematics)



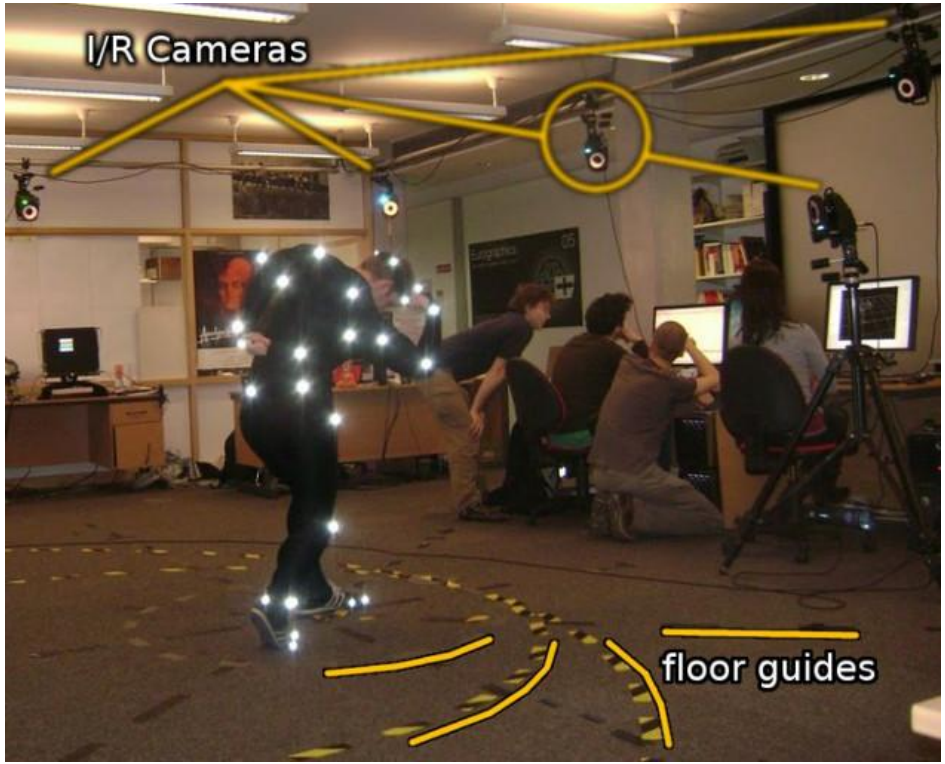
from my OpenGL book

skeletal animation

- harder to set up (weight painting is tricky)
- easier to animate
- does not do faces/fluids very well
- can hook up with **mocap**



skeletal animation and mocap



- ring of infra-red cameras
- calibration stage with wand
- markers tracked in 3d software
- roughly correspond to joints
- export and clean-up process
- may need to repeat performances
- quite a lot of jobs
- databases of captures exist
- can use a “standard” rig to match

interpolation functions

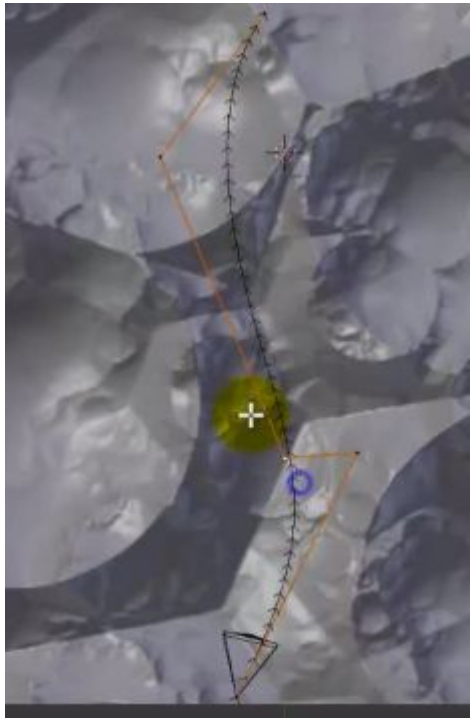
- **Bézier** (Blender default) - speed up then slow down
- **linear** (rest of world default) - move from A to B in straight line
- **constant** - instantly pop to destination (could use to hide/show)

- controlled in the **Graph Editor** view in Blender
- key menu -> interpolation mode
- can right click Bézier knots to change curve shapes

- can also use the **Dope Sheet** to move/stretch timing of animation keys

Camera Techniques - path follow

- create a path to follow (**Shift+A**, **curve**, **path**)
- **splines** path (click+drag knots to make bendy)
- **parent** camera object to “**follow path**”
- “**nurbs path**” appears in property pane
- and a focal point for it to point towards
  - dampen constraint



https://youtu.be/vasfFsxCsAE

Camera Techniques - switch cameras

- in Blender you have to add a **Marker** (not a keyframe) to do this
  - in **Timeline** view **Marker->Add Marker**
- example:
  - add a second camera
  - add a marker at frame 0
  - select a camera in 3d view
  - in Timeline view->bind camera to marker (ctrl+B)
  - repeat for marker at frame 100 and second camera
  - animate -- see arrow on cameras switch (or in through-camera view)
- definitely do this - much more interesting compositions

Camera Techniques - lens properties

- select a camera
- look for camera icon in **properties** pane
- try changing **focal length** - not just zoom, changes perspective
- **instant drama!**

Find some examples of the “Dolly Zoom” effect -
from Alfred Hitchcock’s “Vertigo”

https://youtu.be/VNO3BtNT9bY

Submitting Assignment

- 8 April -- last day of Hilary Term teaching. does this work? exam period 3-27 May

- report ~1-2 pages (pref. PDF format)
- online video ~30s (can be a private link if you prefer)
- make it easy for me to grade / appreciate
  - table of techniques used or evaluated
  - make it clear what work is your own creation
- you can email me the link+report <gerdela@scss.tcd.ie>
  - put CS7029 in subject field
- class youtube playlist yes/no?