

Animation with Maya

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Basic concepts

- Key-frame animation
 - any attribute is a function of time
- Reactive animation
 - attribute is a function of another attribute
- Deformers
 - Non-linear modification of shape and space
- Physical animation
 - attribute is driven by laws of dynamics ($\mathbf{f}=\mathbf{ma}$)

Key-frame animation

1. Set time (position time slider)
2. Edit attribute (move, rotate, etc)
3. Set key ('s' key)
4. Playback
5. Visualize/edit curves with Graph Editor
- value and tangents

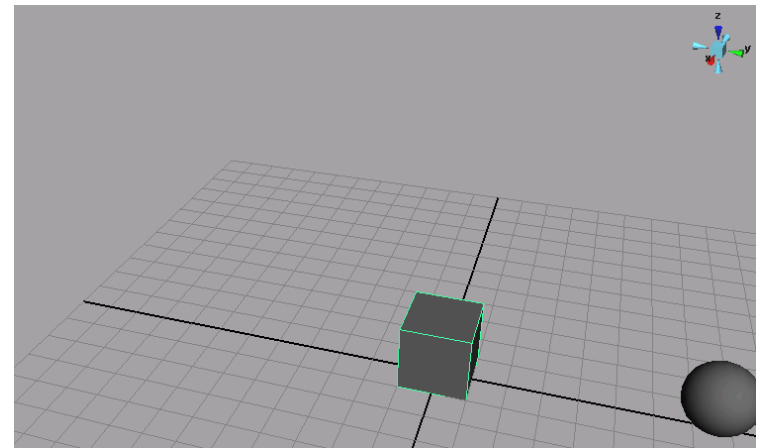
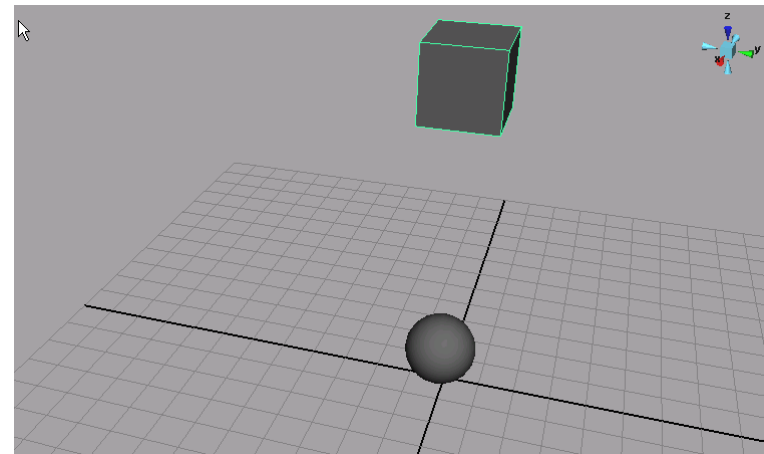
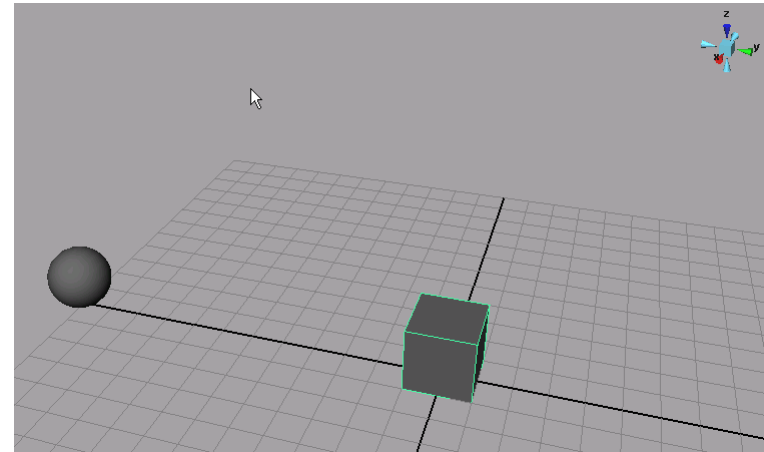
Attribut



time

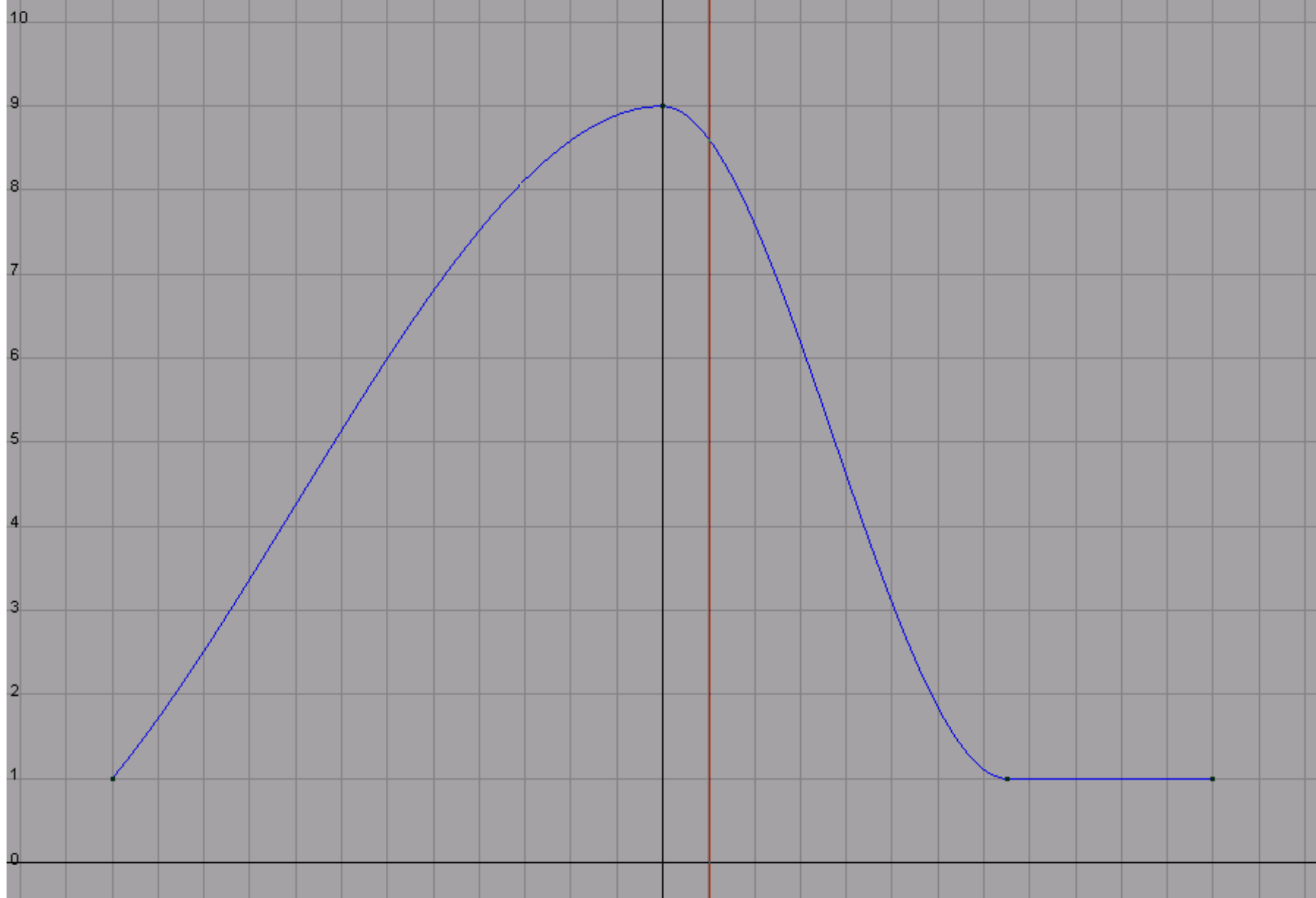
Reactive animation

- Driven-key animation
(*Animate>Set Driven Key*)
 - Ex: the cube “avoids” the sphere
 - Sphere is the “driver”
 - Cube is the “driven”



pCube1.translateZ

Translate Z Cube



00:00:00:01

Translate Y Sphere

pSphere1.translateY

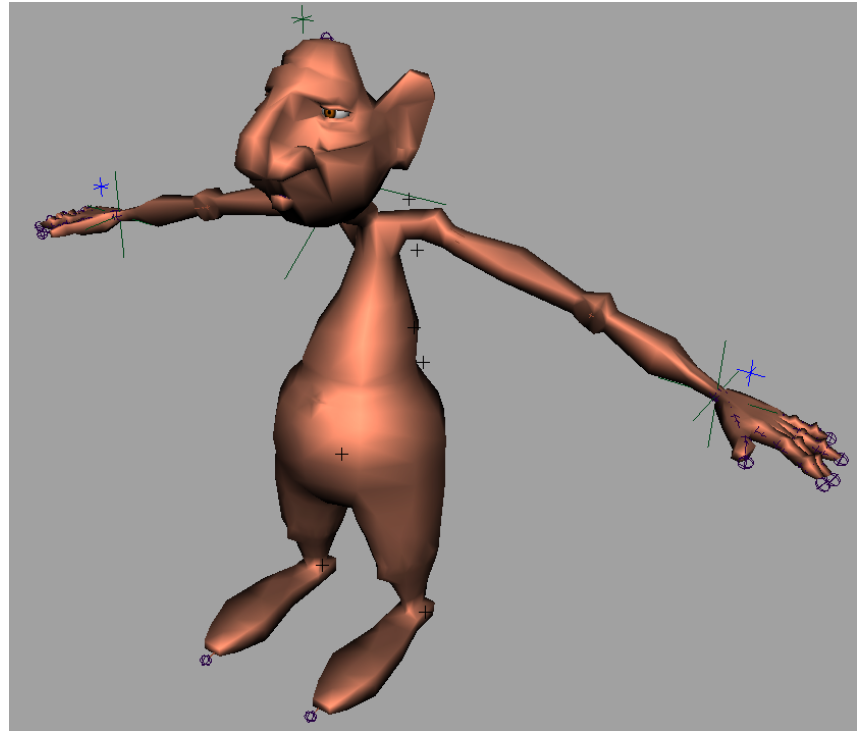
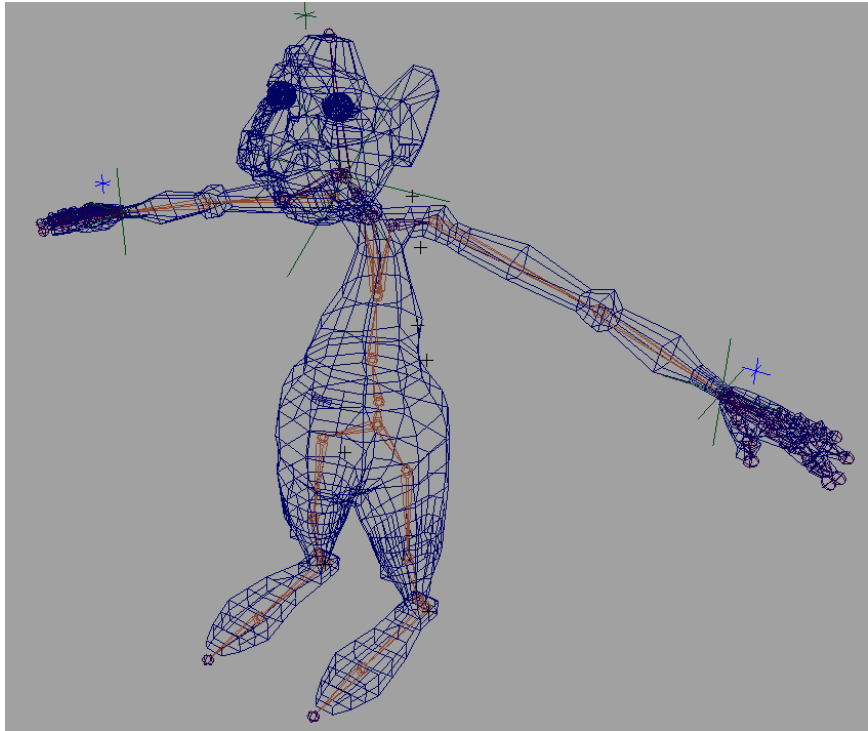
Deformers

- Nonlinear tools
 - Shape: bend, twist, etc (*Deform>Nonlinear*)
 - Space: lattice, wrap, etc
- Vertices morphing
 - Blend shapes
 - typically for facial animation
 - Clusters
 - weights can be edited by “painting”

Character animation

- Create a skeleton
(*Skeleton>Joint Tool*)
 - Create joints chain (end chain with return)
 - Create a hierarchy (click on parent joint)
- Bind a skin
(*Skin>Bind Skin>Smooth Bind*)
 - “Shape” of the character
- Control with IK handle
(*Skeleton>IK Handle Tool*)
 - Higher level of control

Character example



Physical animation

- Specialized menu : *Dynamics*
- Rigid bodies
 - Motion (inertia, $\mathbf{f}=\mathbf{ma}$)
 - Collision (contact forces)
- Non-rigid bodies
 - Clothes (mass-spring system)
 - Fluids (particles system, Navier-Stokes)

Physical animation

Simple example

1. Create a scene
2. Create gravity field
(*Fields menu*)
3. Ball => set to Active Rigid bodies
4. Planes => set to Passive Rigid bodies
(*Soft/Rigid bodies menu*)
5. Bind field and Active Rigid body
(*Window>Relationships Editors>Dynamic*)
6. Bake simulation => set keyframes
(*Edit>Keys>Bake Simulation*)

