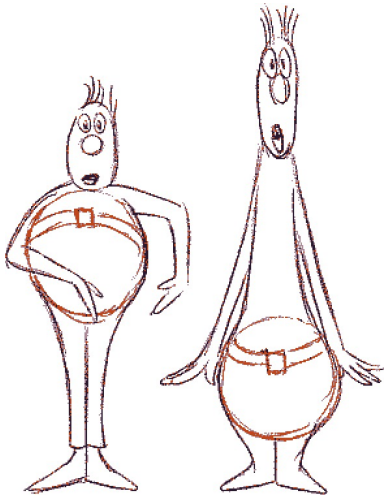
Expressive Animation of Virtual Characters

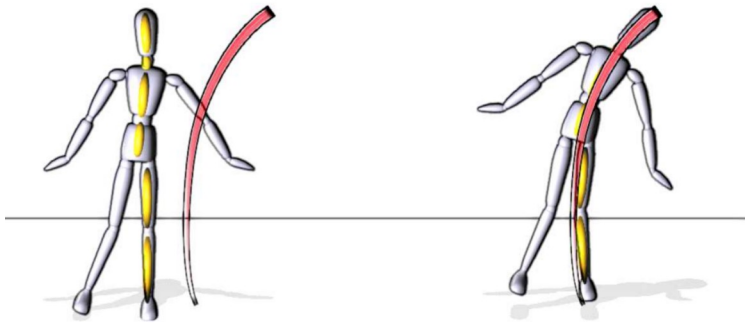
CLIPE Summer School, Sept 2021

Damien Rohmer

Ecole Polytechnique, IP Paris









Presentation schedule

1. Focus, terminology & context
   Signification of “expressive”, context of production Pipeline

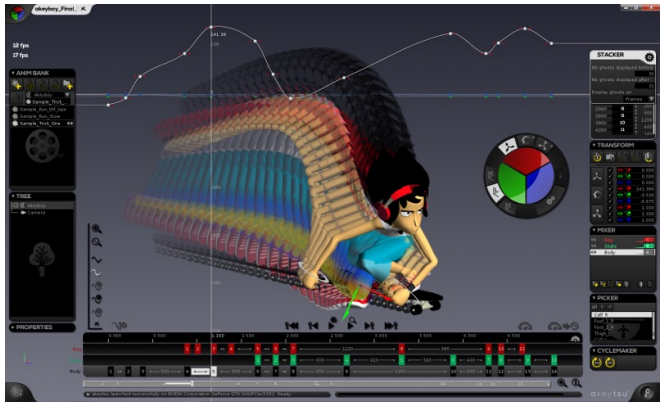
2. Fundamentals of Expressive Animation
   12 principles of animation

3. Overview of Expressive Animation in CG Research
   Manual/Automatic; Key-Frame/Animation

4. Example case: Velocity Skinning

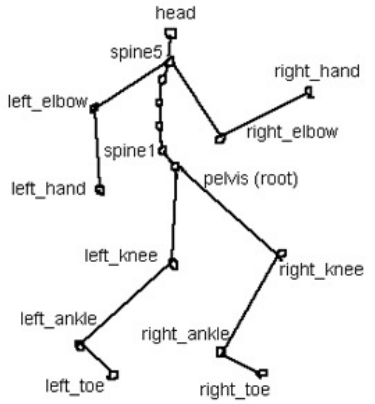
Terminology

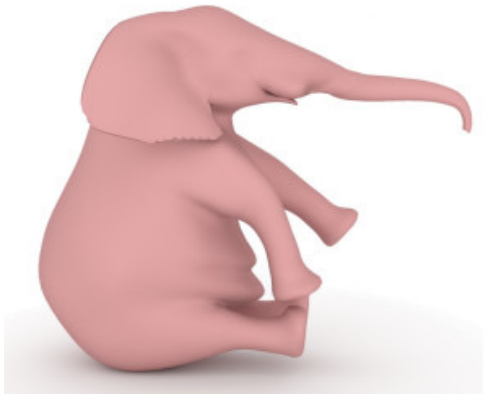
Expressive **Animation of Virtual Characters**



Character body

- its pose *(often a skeleton)*
- its shape/skin deformation





(Not include Facial Animation -> its own topic/research study)

Terminology

Expressive Animation of Virtual Characters

Expressivity comes from "facial expression" – convey a though/feeling

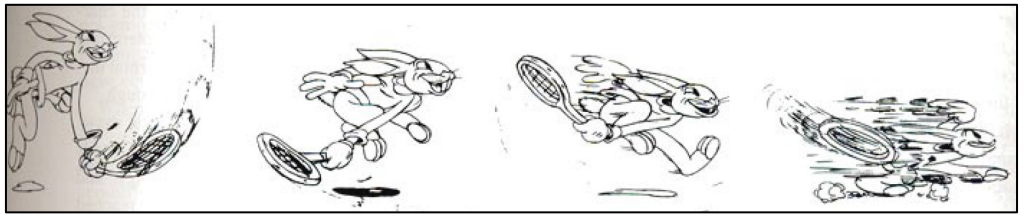


Extended to character animation

convey feeling, but also

energy (dynamics, velocity, weight, etc),

material property (elasticity vs rigidity)







Terminology

Expressive Animation of Virtual Characters

Expressivity comes from "facial expression" – convey a though/feeling

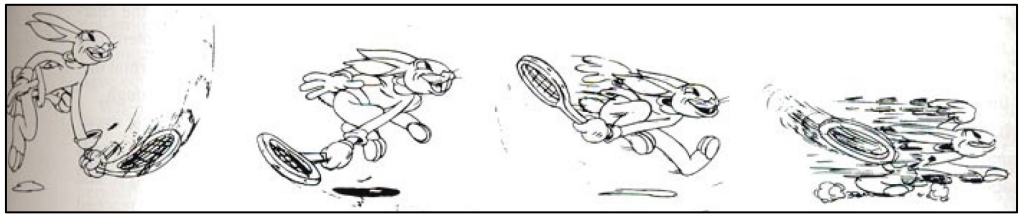


Extended to character animation

convey feeling, but also

energy (dynamics, velocity, weight, etc),

material property (elasticity vs rigidity)



Expressive animation

"Provide visual clues about the animation, using few details/elements/frames"





Terminology

Expressive Animation of Virtual Characters

Expressivity comes from "facial expression" – convey a though/feeling

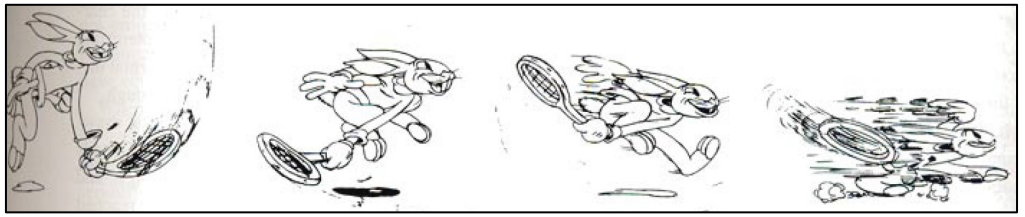


Extended to character animation

convey feeling, but also

energy (dynamics, velocity, weight, etc),

material property (elasticity vs rigidity)



Expressive animation

"Provide visual clues about the animation, using few details/elements/frames"





Notes:

"Expressive" / "Realistic" character animations are two different objectives

(slightly different for "expressive" rendering, "expressive" facial animation)

"Expressive Animation Design" -> User inputs (Sketch-based, VR handles, etc)

History of expressive animation

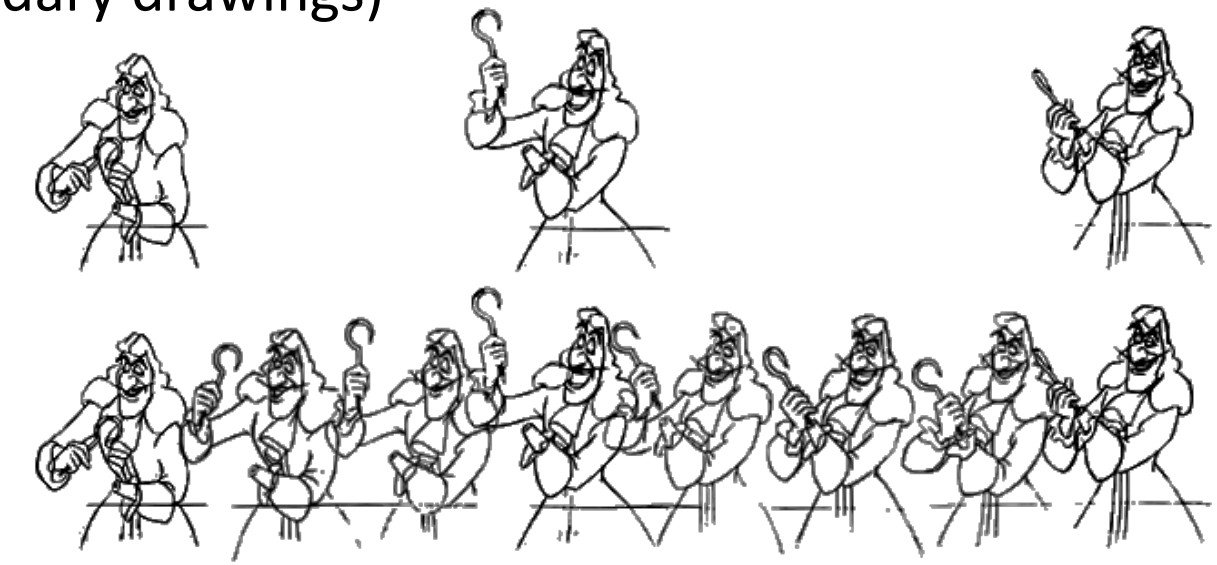
Related to early cartoon (~1910-50)

- Cartoon animation: ~30 drawings /sec (hand drawns) / sec

Principle of **key-framing**

Expressivity is key

- Animator in chief: Create **Key Frames**
- Assistants: Fill the in between (secondary drawings)



(c) Walt Disney Company, from "The Illusion of Life"

History of expressive animation

Related to early cartoon (~1910-50)

- Cartoon animation: ~30 drawings /sec (hand drawns) / sec

Principle of **key-framing**

Expressivity is key

- Animator in chief: Create **Key Frames**
- Assistants: Fill the in between (secondary drawings)

Interestingly:

- Key-Framing is still a common process in 3D Animation
- In between is automatic interpolation



(c) Walt Disney Company, from "The Illusion of Life"

Production Pipeline in Animation

Pre-production

Storyboard, Animatic, Layout

Production

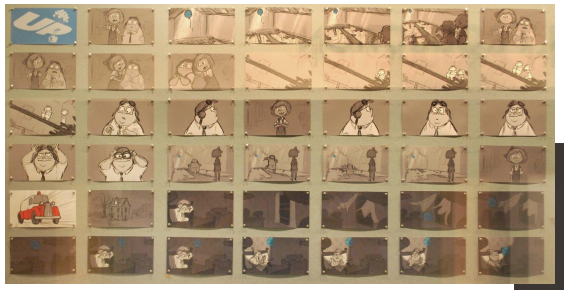
Modeling

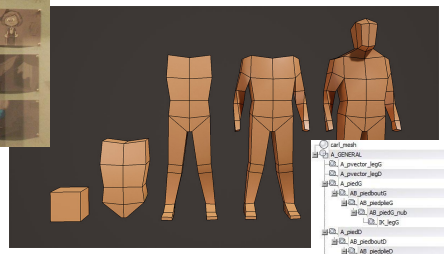
Rigging

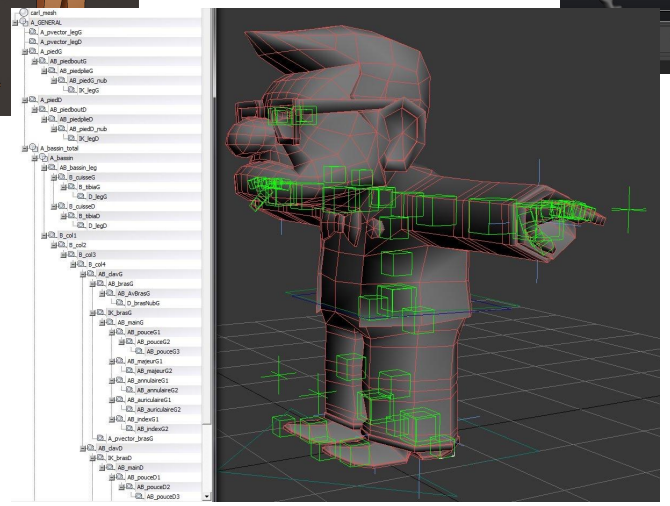
Animation

Post-Production

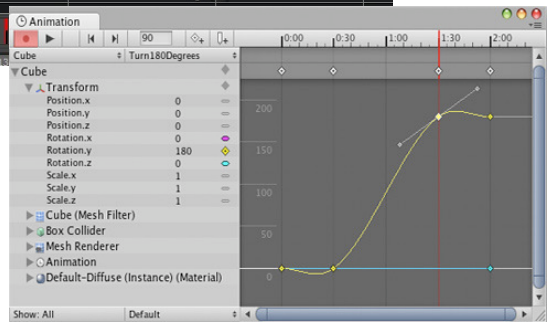
Rendering, Compositing, Editing











"Animation" = key-framed with animation curves
Otherwise "VFX"

Presentation schedule

1. Focus, terminology & context
   Signification of “expressive”, context of production Pipeline

2. Fundamentals of Expressive Animation
   12 principles of animation

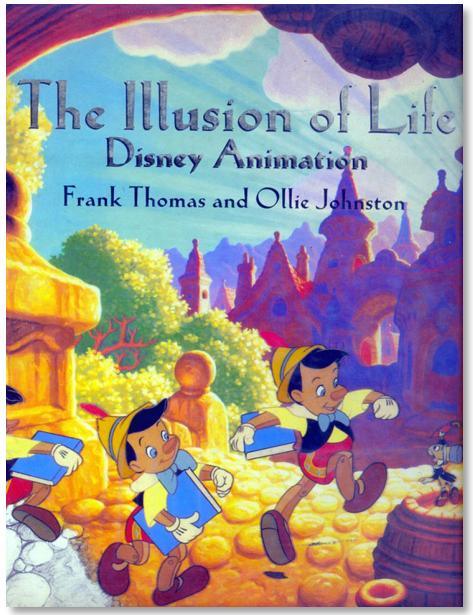
3. Overview of Expressive Animation in CG Research
   Manual/Automatic; Key-Frame/Animation

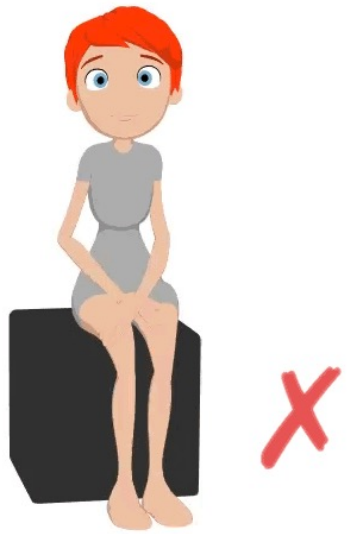
4. Example case: Velocity Skinning

History of expressive animation

- Basic interpolation b/w realistic poses doesn't provide expressive animation
- Formulation of "12 Fundamental Principles of Animation"

  [F. Thomas and O. Johnston, Disney – The Illusion of Life, 1981]





"robotic" feel



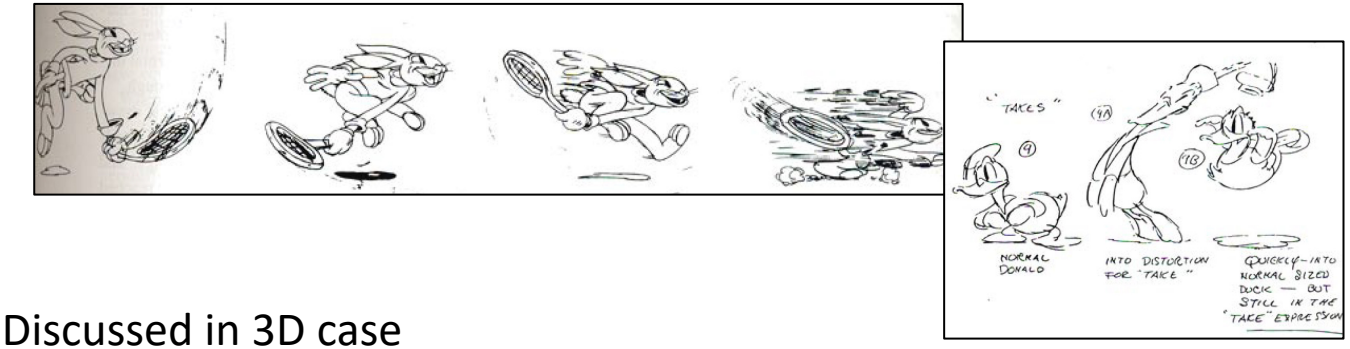
"lively" feel

12 Principles of Animation

1. Timing
2. Spacing
3. Slow-in, Slow-out
4. Squash & Stretch
5. Anticipation
6. Exaggeration
7. Follow Through
8. Secondary Action
9. Arcs
10. Appeal
11. Staging
12. Straight Ahead/Pose to Pose

Artistic convention more than scientific basis
How animators learn to do animation

Initially for 2D animation



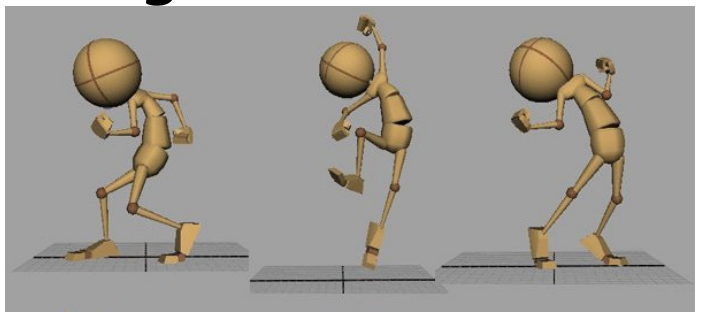
Discussed in 3D case

[John Lasseter – Principles of Traditional Animation Applied to 3D Computer Animation. SIGGRAPH 87]



Timing (1) and Spacing (2)

*Animator-related terminology related to **key-framing***



- **Posing** the key frames

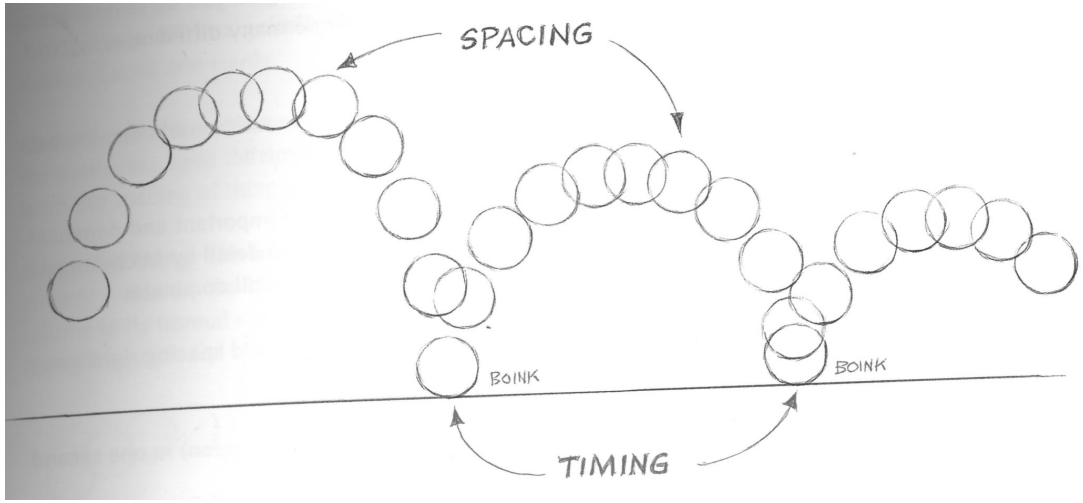
  Set the general posture of the character (no time involved)

- **Timing**: Place key frames at specific times

  global duration of an action

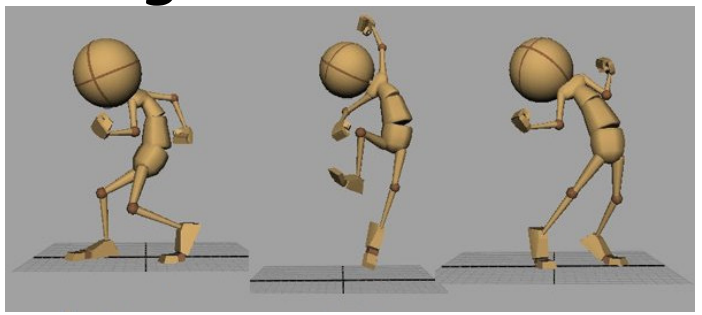
- **Spacing**: Change of speed in the interpolation

  local dynamics of the action



Timing (1) and Spacing (2)

*Animator-related terminology related to **key-framing***



- **Posing** the key frames

  Set the general posture of the character (no time involved)

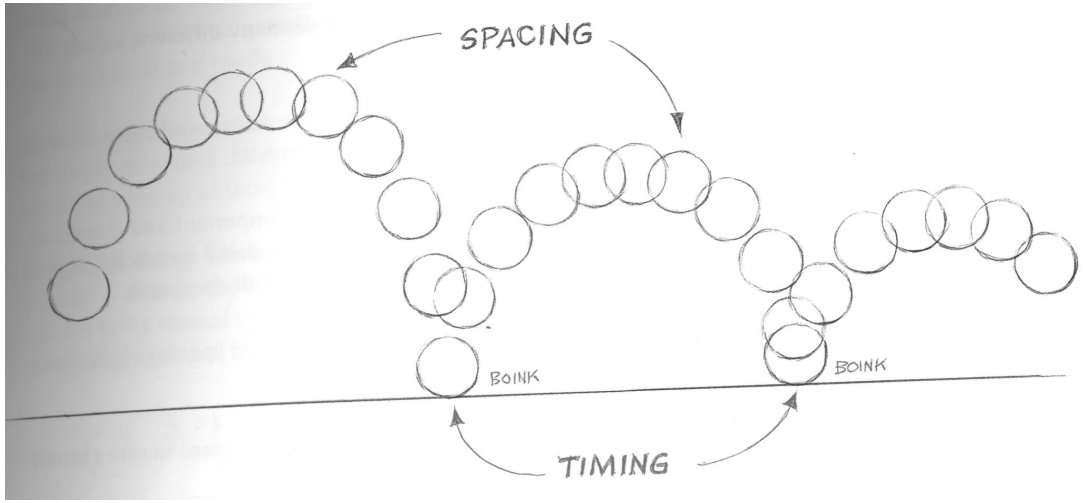
- **Timing**: Place key frames at specific times

  global duration of an action

- **Spacing**: Change of speed in the interpolation

  local dynamics of the action

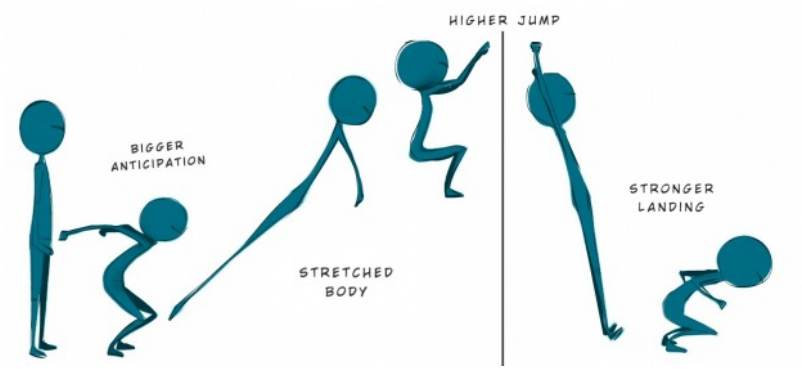
  → *Slow-in/Slow-out (3)*



Principles of Animation

Squash & Stretch (4)

Common in cartoon



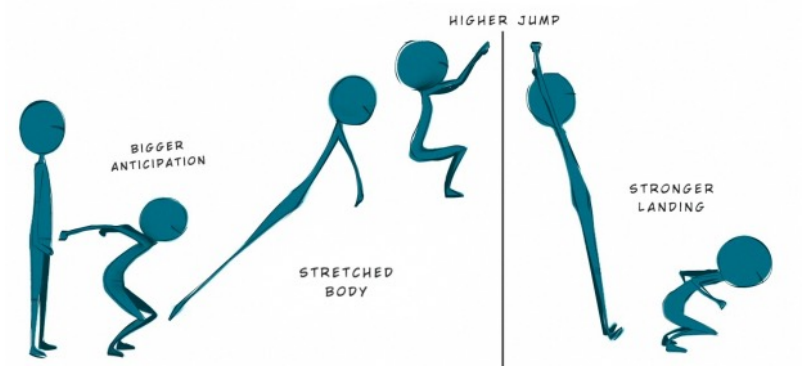
Unrealistic
but surprisingly “plausible”



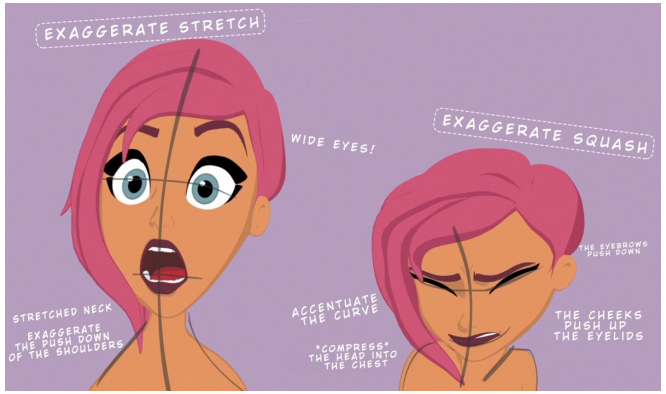
Principles of Animation

Squash & Stretch (4)

Common in cartoon



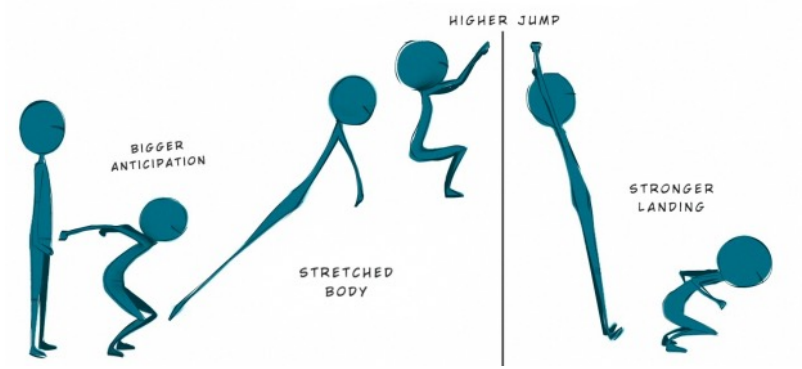
Unrealistic
but surprisingly “plausible”



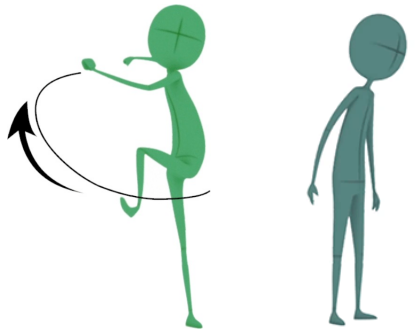
+ Exaggeration (6) – “energy involved”

Principles of Animation

Squash & Stretch (4)



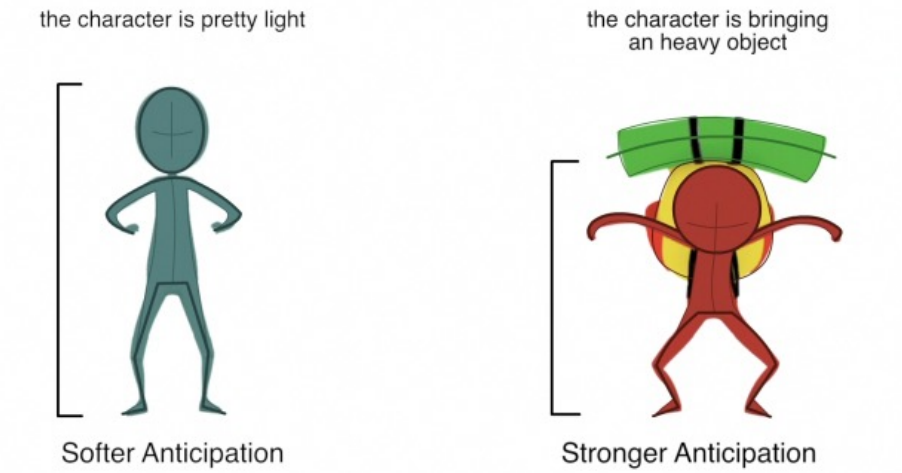
Anticipation (5)



Common in cartoon

Unrealistic
but surprisingly “plausible”





+ Exaggeration (6) – “energy involved”

Principles of Animation

Follow through (7), secondary action (8)



Passive elements
Follows the main motion with delay (inertia)

Principles of Animation

Follow through (7), secondary action (8)



Passive elements
Follows the main motion with delay (inertia)

Arcs (9)



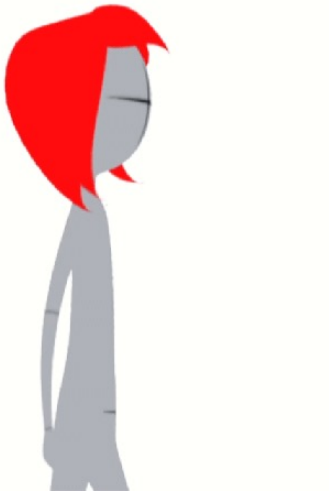




No straight line trajectories

Principles of Animation

Follow through (7), secondary action (8)



Passive elements
Follows the main motion with delay (inertia)

Arcs (9)







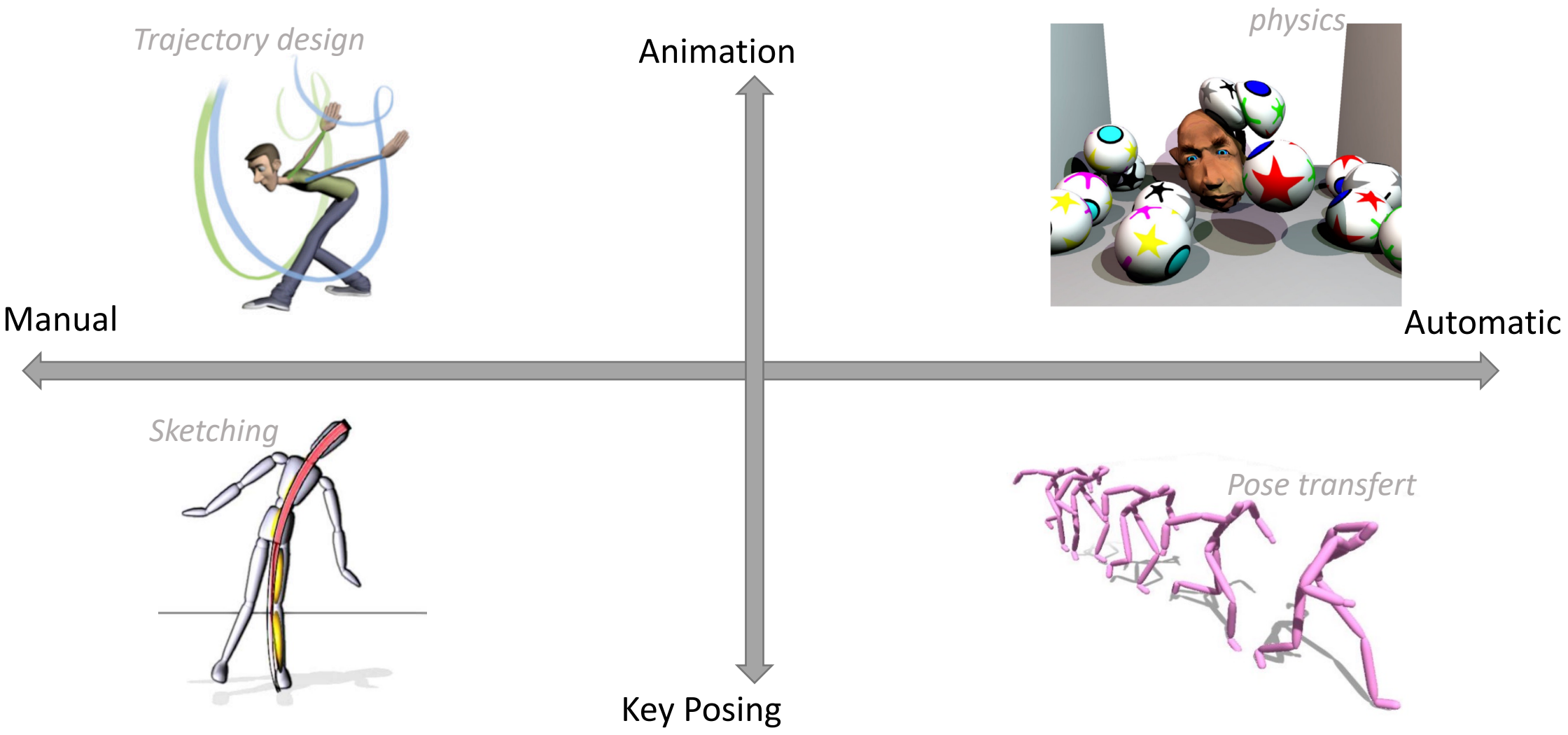
No straight line trajectories

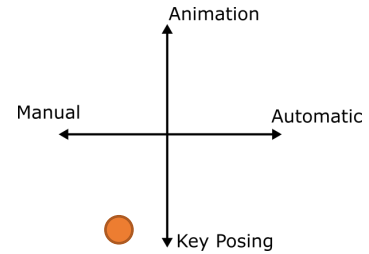
Skip: Staging, Appeal, Straight ahead/Pose to pose - More about scene appeal, process of creation

Presentation schedule

1. Focus, terminology & context
   Signification of “expressive”, context of production Pipeline
2. Fundamentals of Expressive Animation
   12 principles of animation
3. Overview of Expressive Animation in CG Research
   Manual/Automatic; Key-Frame/Animation
4. Example case: Velocity Skinning

General classification





The line of Action - Principle

Central curve across the character

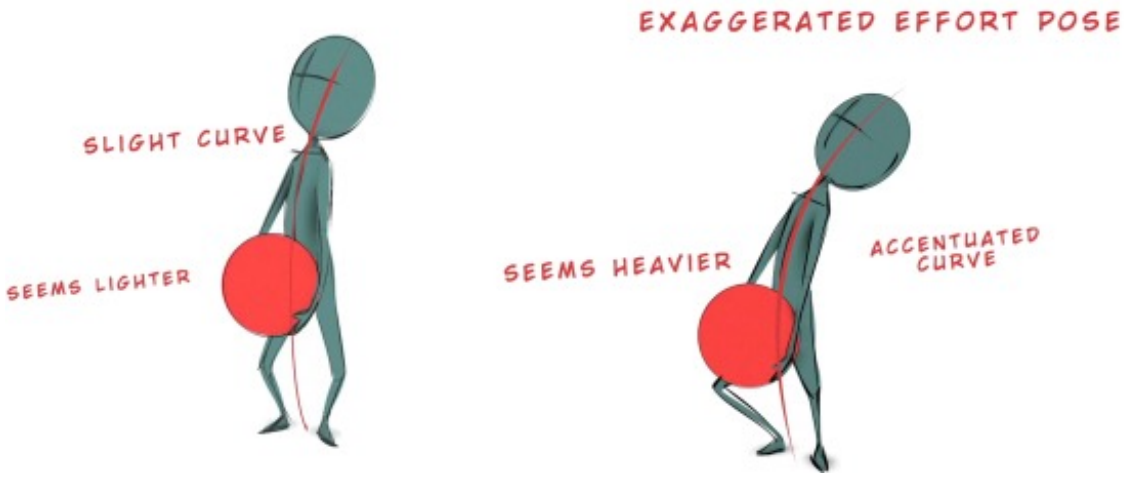
Simple element => lot of expressivity

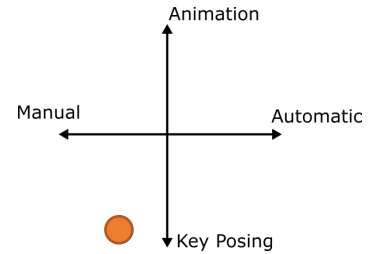
Straigh curve => “stable state” / low energy

Bent curve => “unstable state” / dynamics



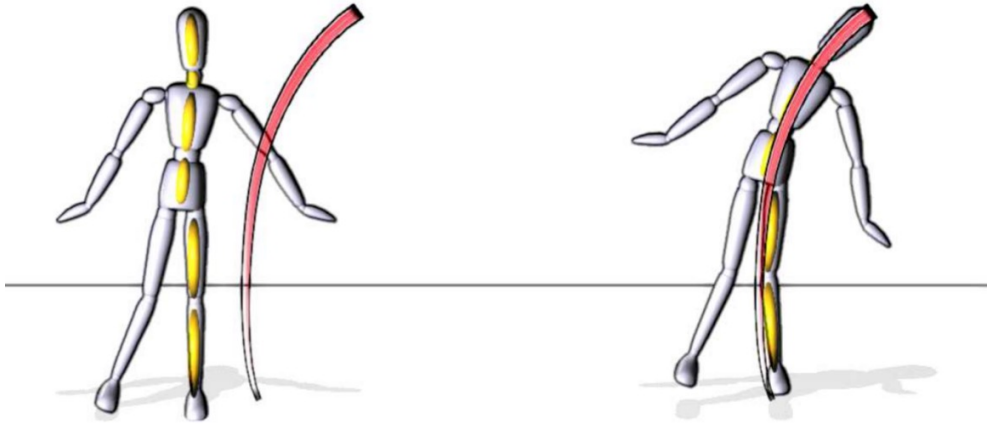


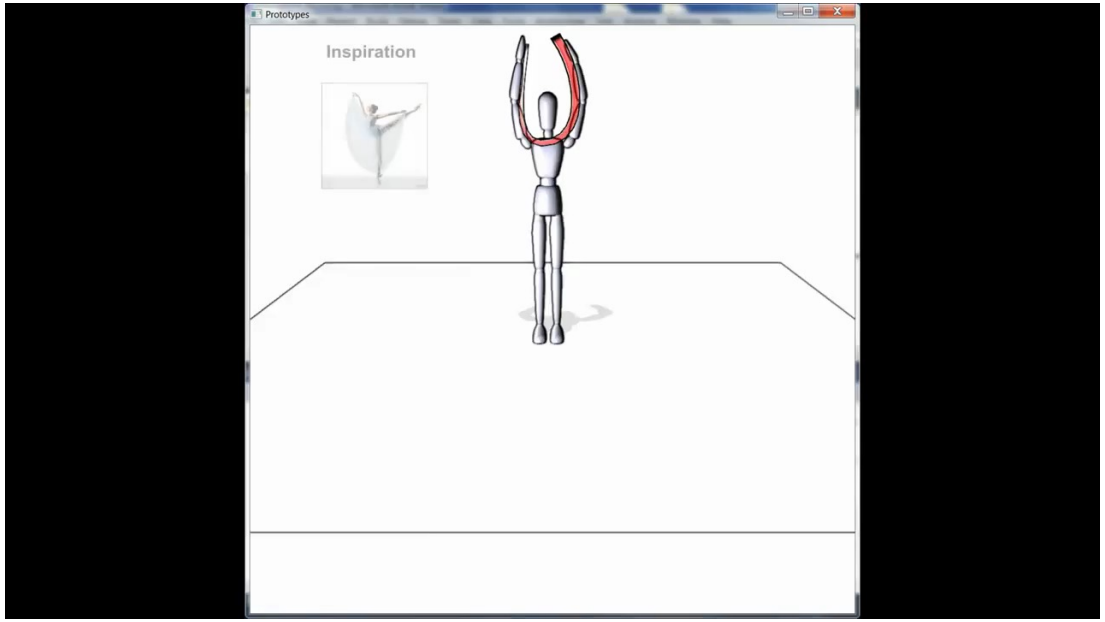




The line of Action

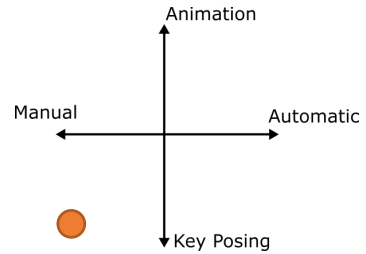
[Guay et al., The Line of Action: an Intuituve Interface for Expressive Character Posing. SIGGRAPH Asia 2013]





Idea: Match **skeleton** & **sketched curve**
for **positions** & **tangents**
in **screen space**

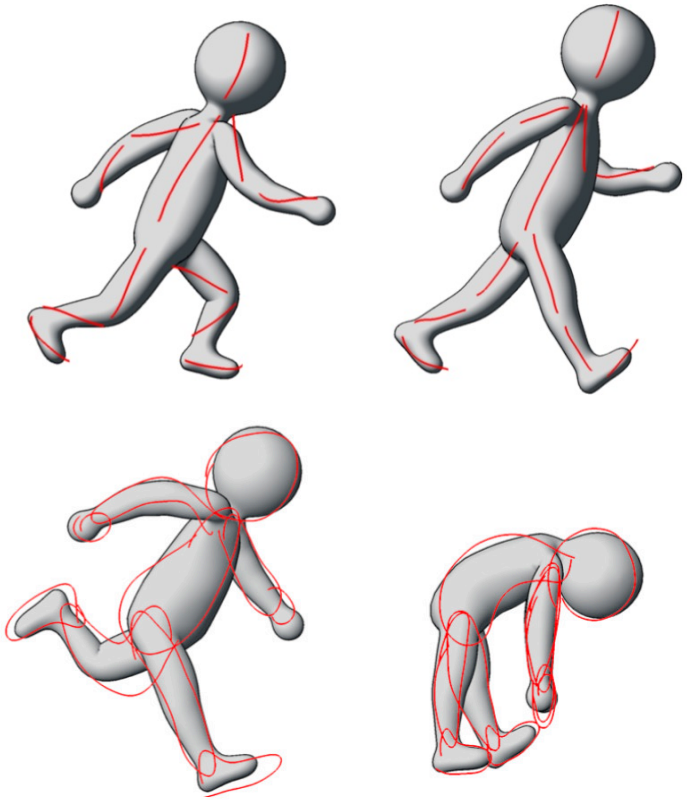
$$\min_{p_{sk}(s),t_{sk}(s)} \alpha\|p_{sk}(s) - p_c(s)\|^2 + \beta\,\|t_{sk}(s) - t_c(s)\|^2$$



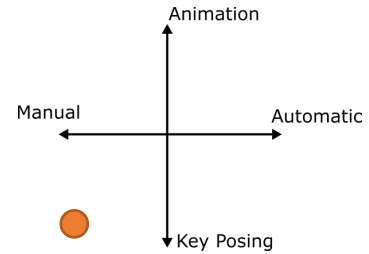
Line of Action follow up

Toward **finer character posing**

[Hahn et al., Sketch Abstractions for Character Posing. SCA 2015]



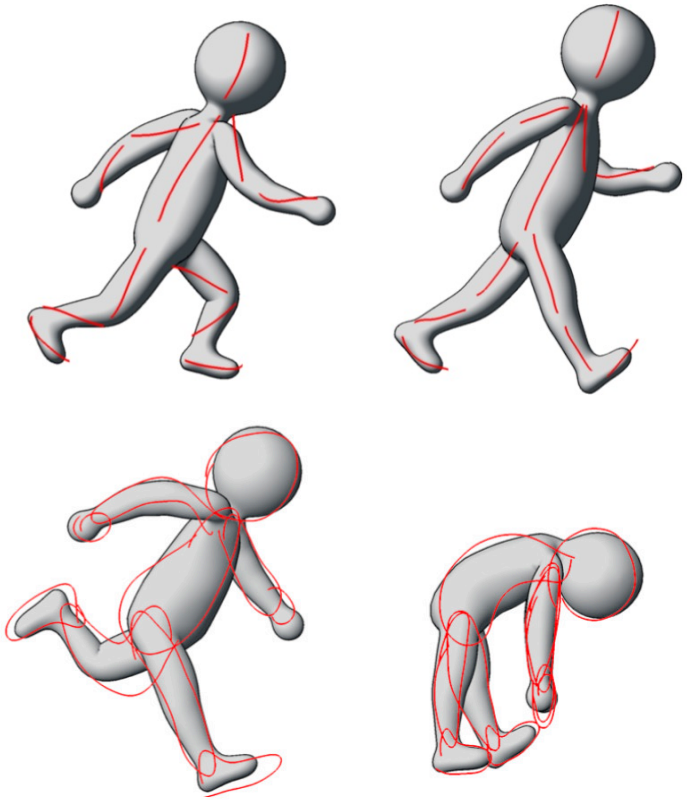
Local correspondence
-> ICP



Line of Action follow up

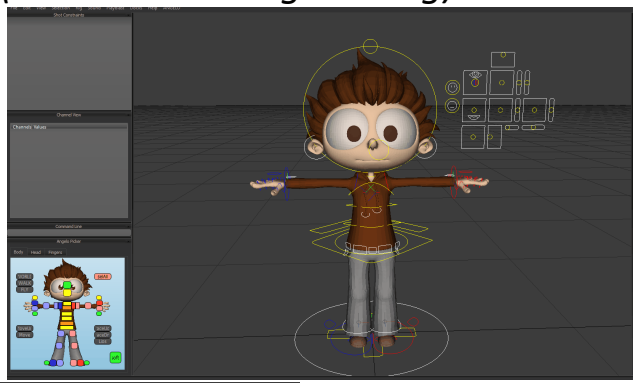
Toward **finer character posing**

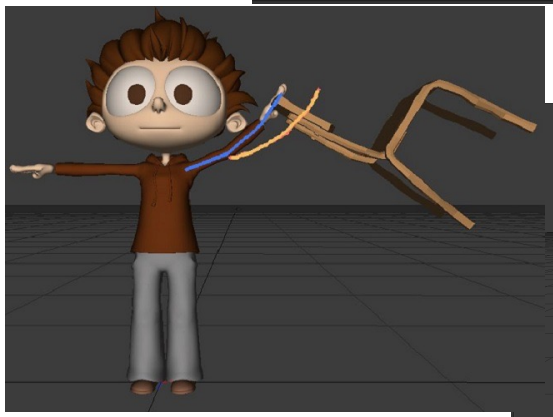
[Hahn et al., Sketch Abstractions for Character Posing. SCA 2015]

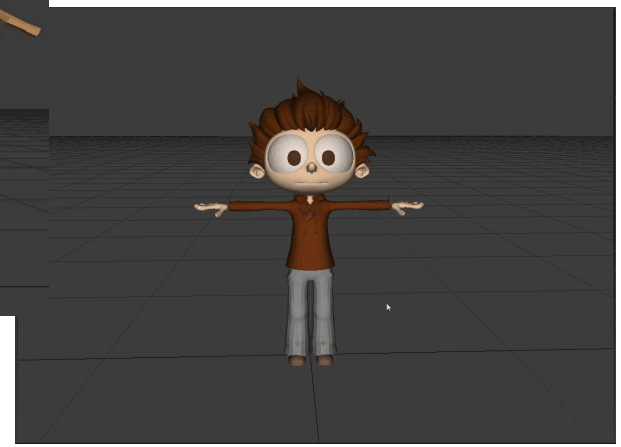


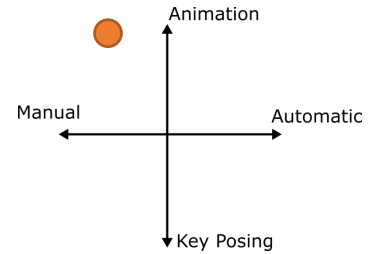
Local correspondence
-> ICP

Production context
(Mercenaries engineering)





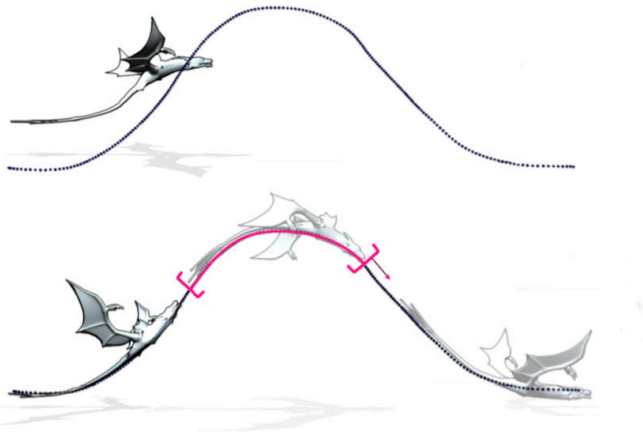




Line of Action follow up

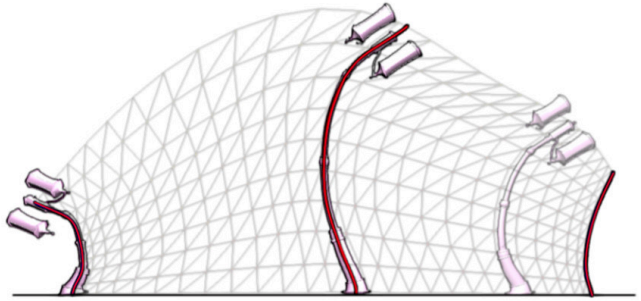
Toward space/time trajectory **synthesis**

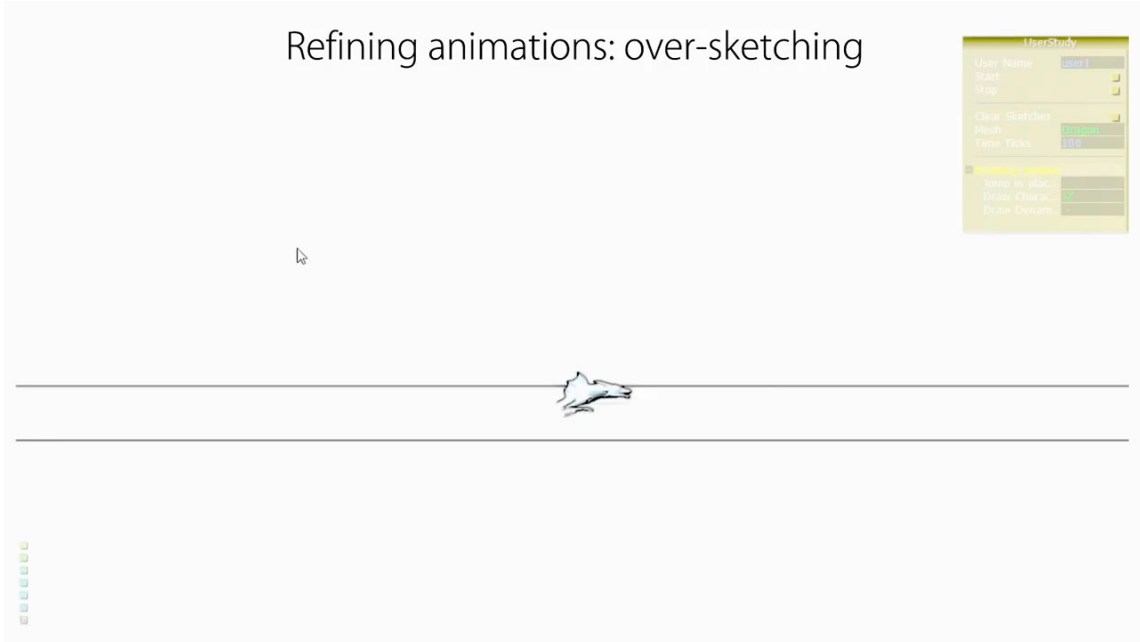
[Guay et al., Space-time sketching of character animation, SIGGRAPH 2015]

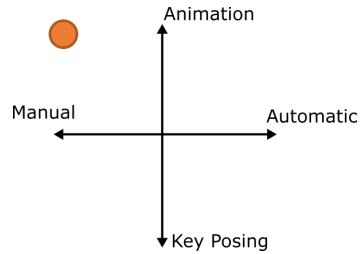


Space-time trajectory
Sliding window

+ Constraints
Space-time interpolation b/w lines of actions



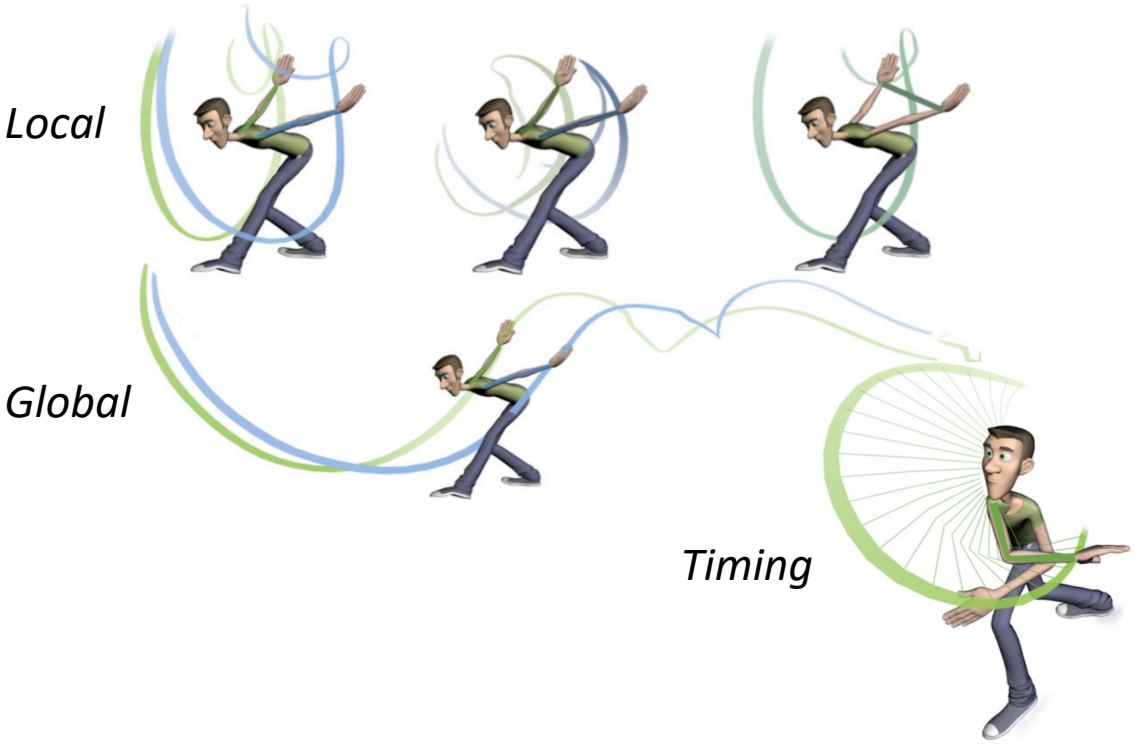




Line of Action follow up

Toward space/time trajectory **edits**

[Choi et al., SketchiMo: Sketch-Based Motion Editing for Articulated Characters, SIGGRAPH 2016]





SketchiMo follow up

Dedicated to motion cycles

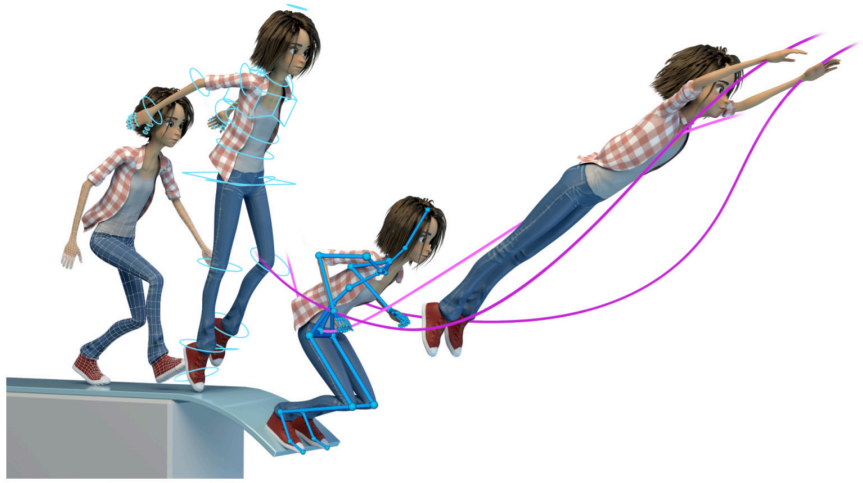
[Ciccone et al.,
Authoring Motion Cycles, SCA 2017]





Preserving Bézier animation curves

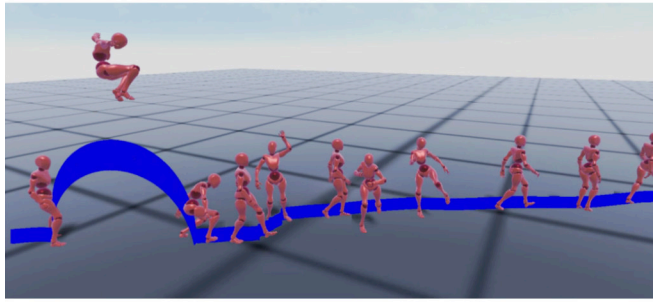
[Ciccone et al.,
Tangent-Space Opt. for Interactive
Animation Control, SIGGRAPH 2019]

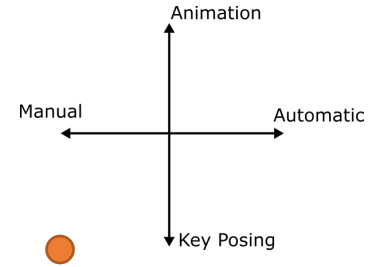


More expressive inputs

[Garcia et al.,
Spatial Motion Doodles, MIG 2019]



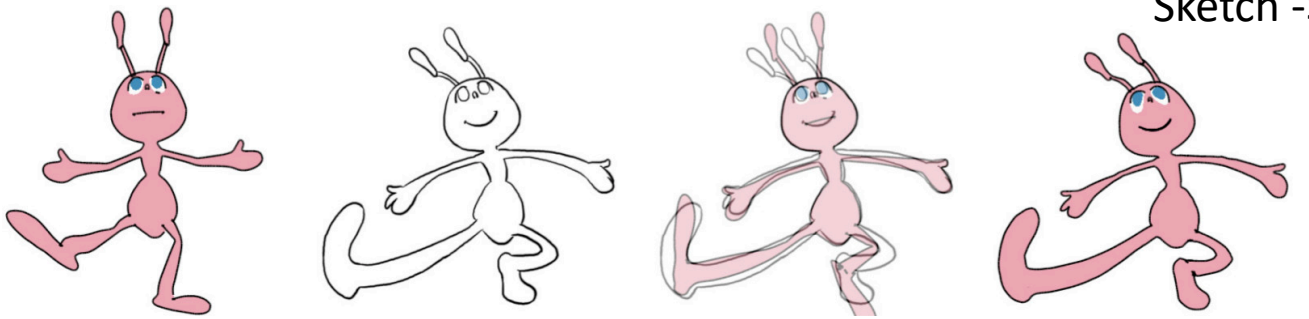


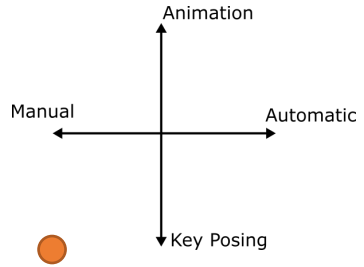


Manual control of Key Poses deformation

[Li et al., Stylizing Motion with Drawings, SCA2003]

Sketch -> Image based wrap

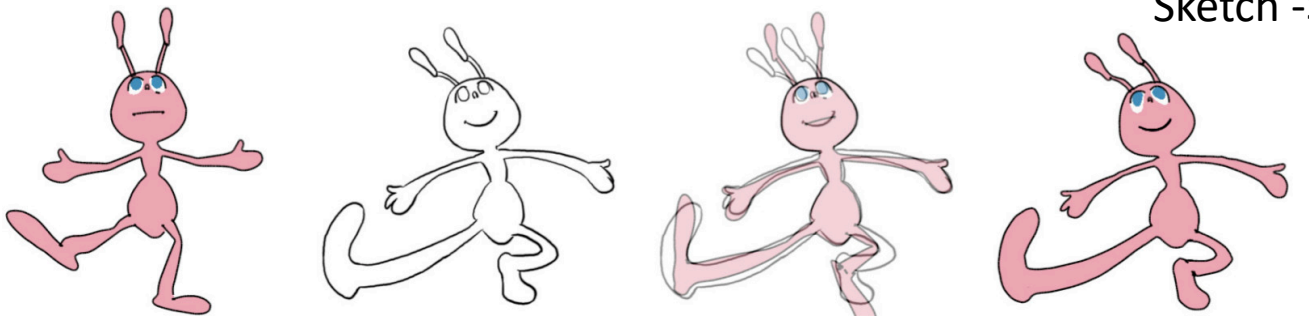




Manual control of Key Poses deformation

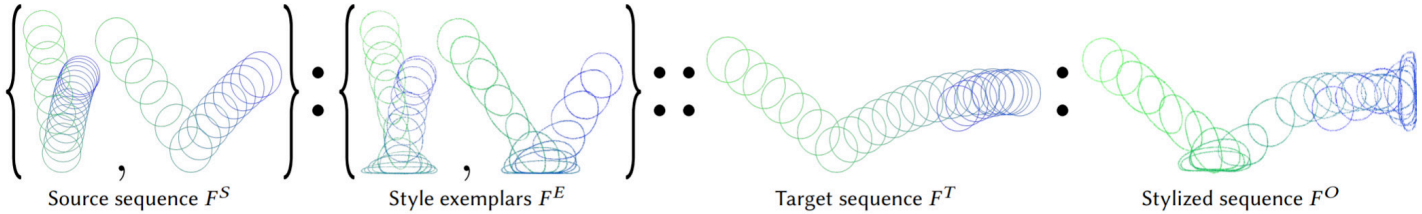
[Li et al., Stylizing Motion with Drawings, SCA2003]

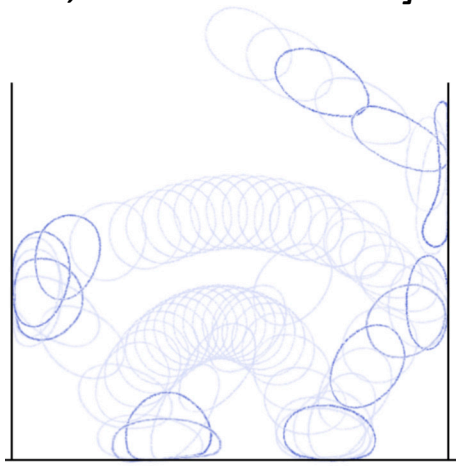
Sketch -> Image based wrap



[Dvoroznak et al., Example-Based Expressive Animation of 2D Rigid Bodies, SIGGRAPH 2017]

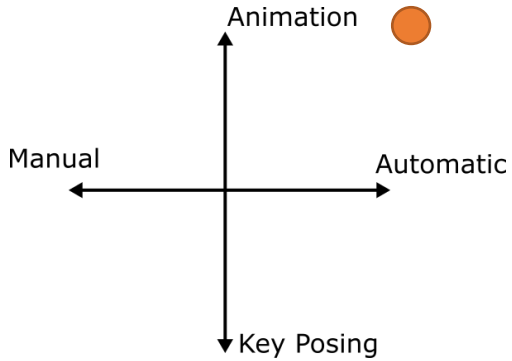
Stylized examples sequence
Match input sequences -> apply parametric deformation





Note: limited to 2D animations

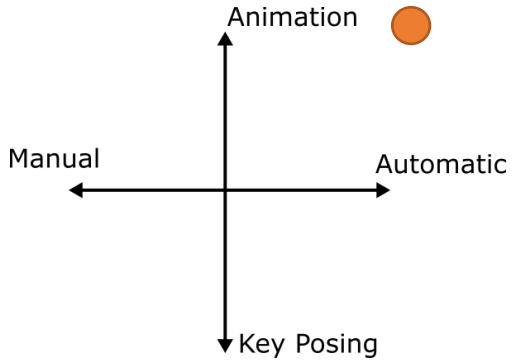
Automatic animation methods



Physics-based simulation

(+) provide automatically dynamics/inertia for skin deformation (secondary effects, follow through, etc)

Automatic animation methods



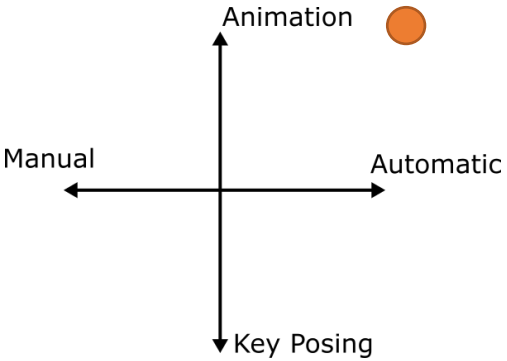
Physics-based simulation

(+) provide automatically dynamics/inertia for skin deformation (secondary effects, follow through, etc)

Main challenges:

- *How to add/control expressive part*
- *Computational efficiency*

Automatic animation methods



Physics-based simulation

(+) provide automatically dynamics/inertia for skin deformation (secondary effects, follow through, etc)

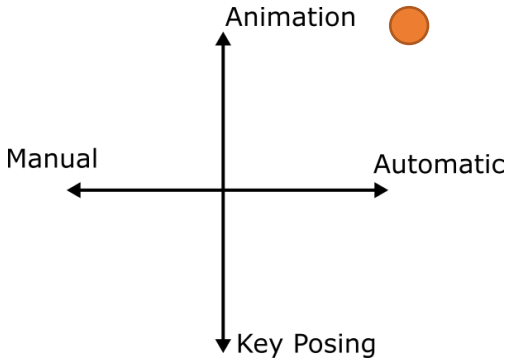
Main challenges:

- *How to add/control expressive part*
- *Computational efficiency*

Parameter fitting
(limited possibility)

Constrained optimization
$\alpha E_{physics} + \beta E_{constraints}$

Automatic animation methods



Physics-based simulation

(+) provide automatically dynamics/inertia for skin deformation (secondary effects, follow through, etc)

Main challenges:

- *How to add/control expressive part*
- *Computational efficiency*

Parameter fitting
(limited possibility)

Constrained optimization
$\alpha E_{physics} + \beta E_{constraints}$

Reduced domains

[Xu16]
[Zhang20]
…

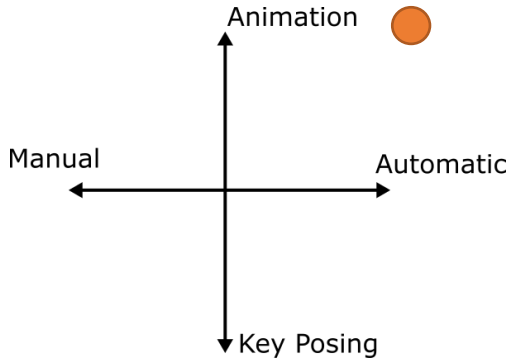






[Zhang et al., Complementary Dynamics, SIGGRAPH 2020]

Automatic animation methods



Physics-based simulation

(+) provide automatically dynamics/inertia for skin deformation (secondary effects, follow through, etc)

Main challenges:

- *How to add/control expressive part*
- *Computational efficiency*

Parameter fitting
(limited possibility)

Constrained optimization
$\alpha E_{physics} + \beta E_{constraints}$

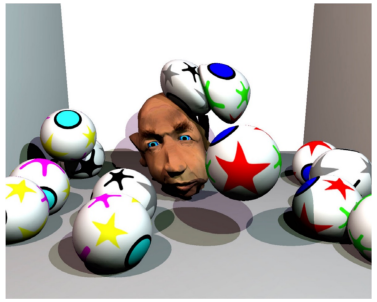
Reduced domains

[Xu16]
[Zhang20]
…

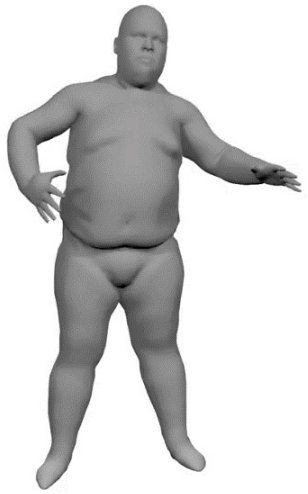


Positions Based

[Rumman14]
[Komaritzan18]

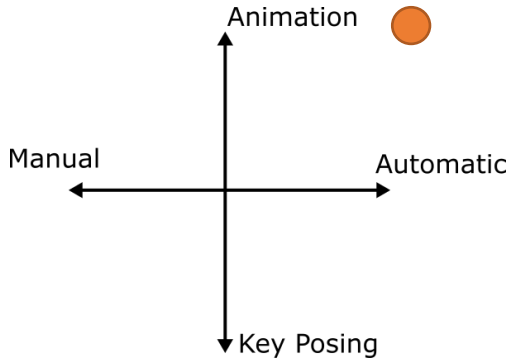


Collisions



[Komaritzan et al., Fast projective skinning, MIG 2019]

Automatic animation methods



Physics-based simulation

(+) provide automatically dynamics/inertia for skin deformation (secondary effects, follow through, etc)

Main challenges:

- *How to add/control expressive part*
- *Computational efficiency*

Parameter fitting
(limited possibility)

Constrained optimization
$\alpha E_{physics} + \beta E_{constraints}$

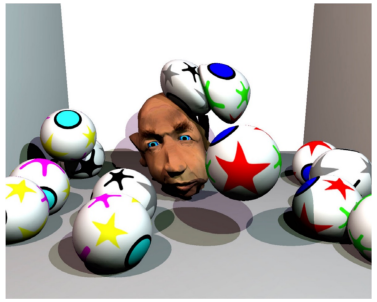
Reduced domains

[Xu16]
[Zhang20]
…



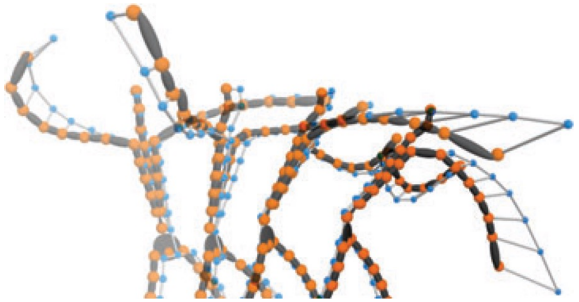
Positions Based

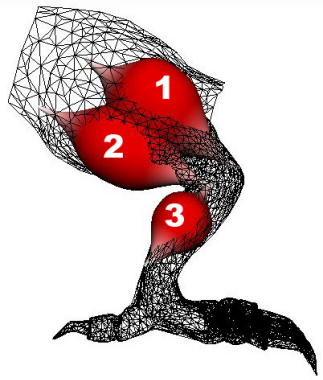
[Rumman14]
[Komaritzan18]



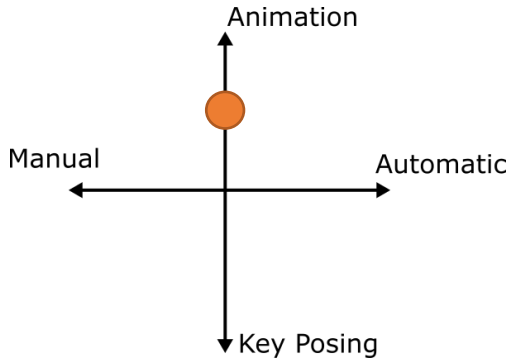
Hybrid Models

[Larboulette05]
[Ji-Yong12]
[Rousselet18]
[Jacobson11]
…





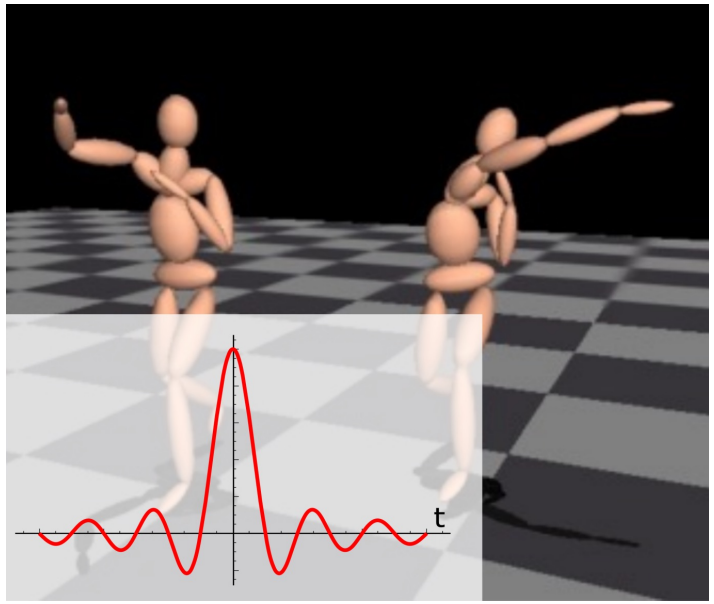
Intermediate – Expressive Kinematics



Automatic deformation – with simple user control

Time filter

[Wang et al., The cartoon animation filter. SIGGRAPH 06]
[Kass, Anderson. Animating Oscillatory Motion with Overlap: Wiggly Splines. SIGGRAPH 08]



+ Time control
- Spatial control

Parametric Bending

[Noble & Tang, Automatic Expressive Deformations for Stylizing Motion*, CGF06]*



+ Bending effect
- No Hierarchy

Presentation schedule

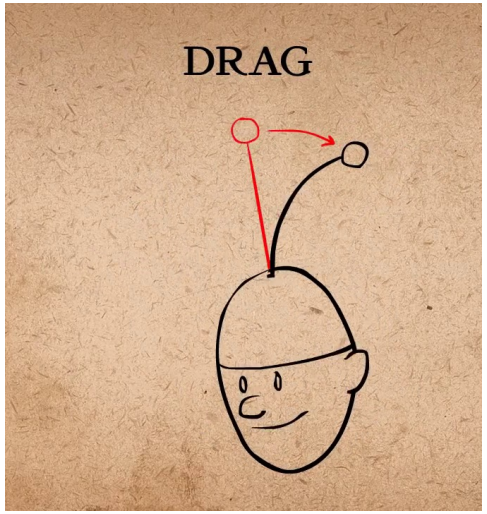
1. Focus, terminology & context
   Signification of “expressive”, context of production Pipeline
2. Expressive Animation Principles
   12 principles of animation
3. Overview of Expressive Animation in Research
   Manual/Automatic; Key-Frame/Animation
4. Example case: Velocity Skinning

Velocity Skinning



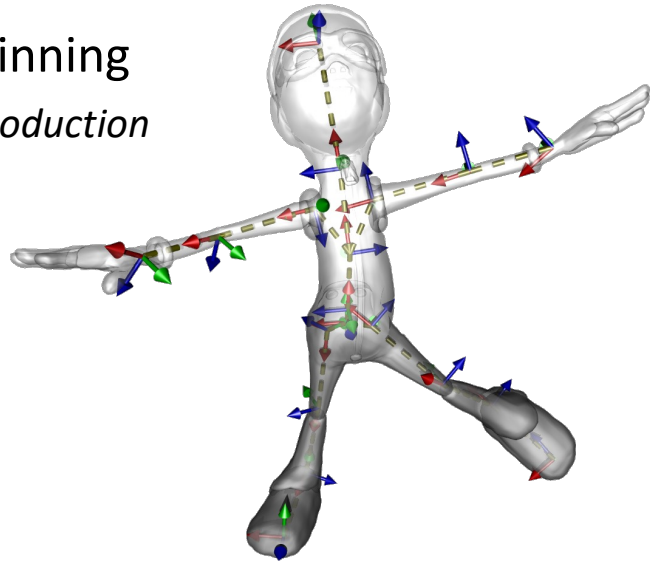
Objective:

1) Cartoon effects
 - Drag
 - Stretch

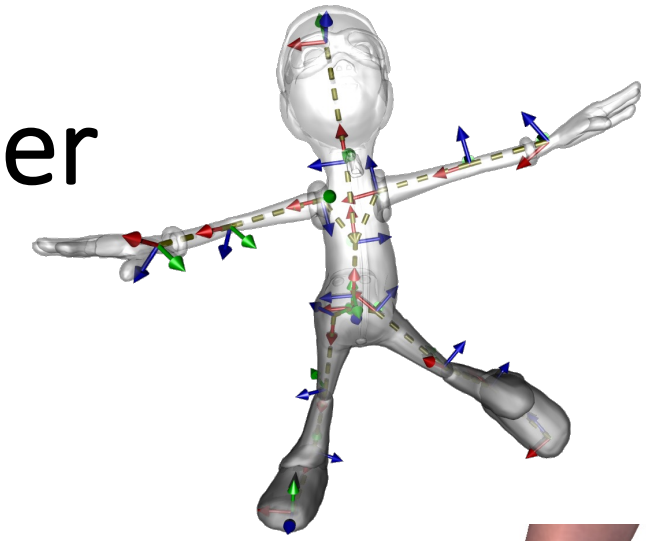


2) Fit to standard Skinning

Typical LBS used in production



Skinning – Formulation Reminder



Rigid Skinning

skin vertices rigidly attached to a joint

Formulation

Matrix 4x4

Rest pose: Frame T^0, vertex v^0

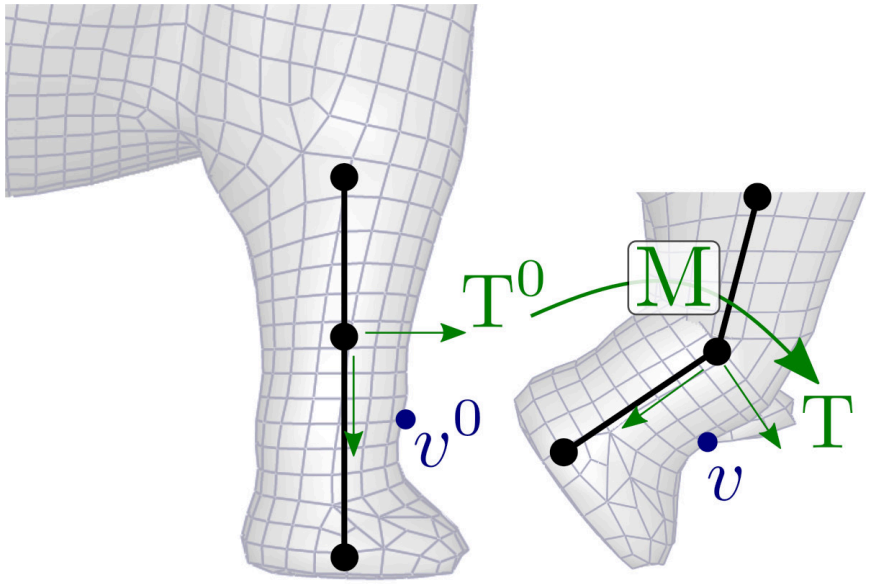
Deformed: Frame T, vertex v

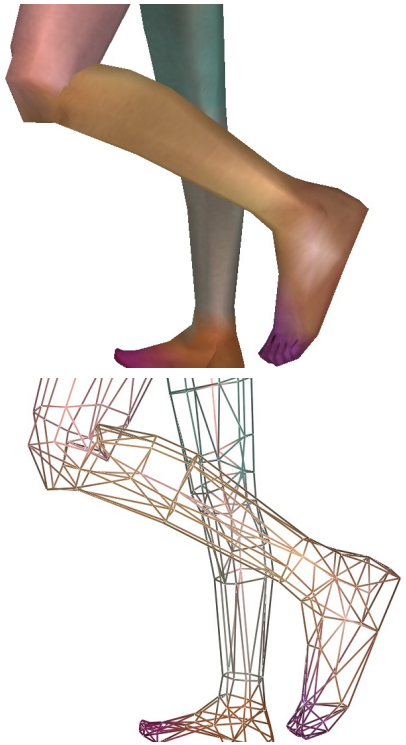
v0 and v have same local coordinates

$\Rightarrow T^{-1} V + (T0)^{-1} v^0$

$\Rightarrow V = T\,(T0)^{-1} v^0$

M: Deformation matrix





Skinning

Smooth Skinning / **L**inear **B**lend **S**kinning

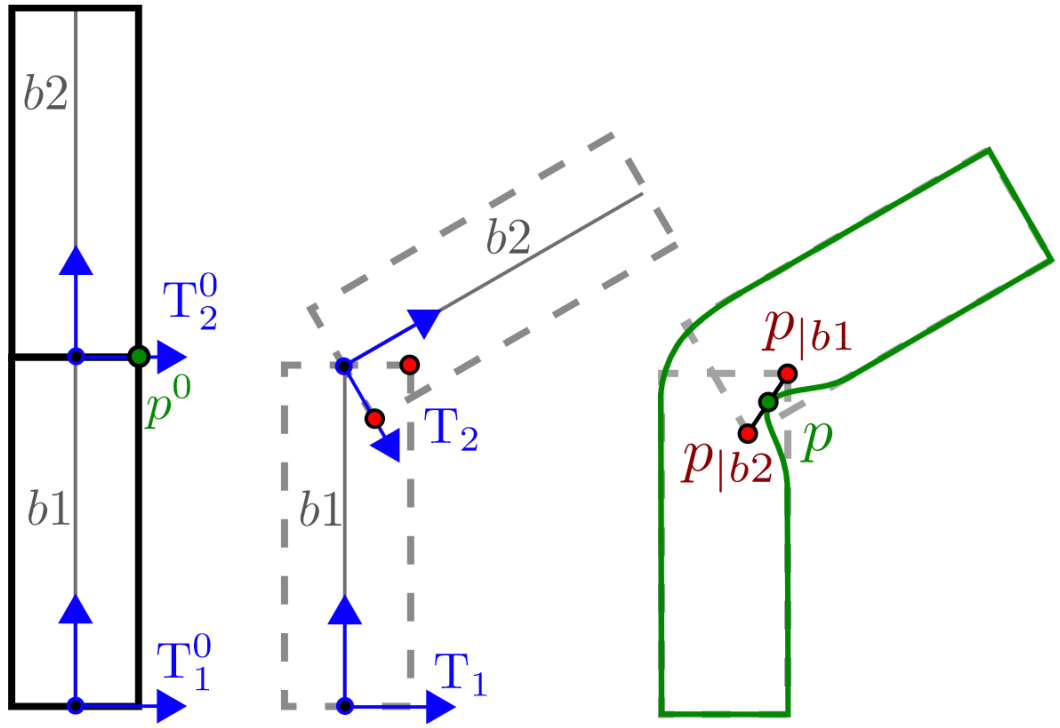
Linear interpolation of positions b/w associated joints

Example at middle vertex position of a bending cylinder

$$p = 0.5\, p_{|b1} + 0.5\, p_{|b2}$$

$$p = 0.5 \underbrace{\mathrm{T}_1 \left(\mathrm{T}_1^0\right)^{-1}}_{\mathrm{M}_1} p^0 + 0.5 \underbrace{\mathrm{T}_2 \left(\mathrm{T}_2^0\right)^{-1}}_{\mathrm{M}_2} p^0$$

$$p = \left(0.5\, \mathrm{M}_1 + 0.5\, \mathrm{M}_2\right) p^0$$



Skinning

Smooth Skinning / Linear Blend Skinning

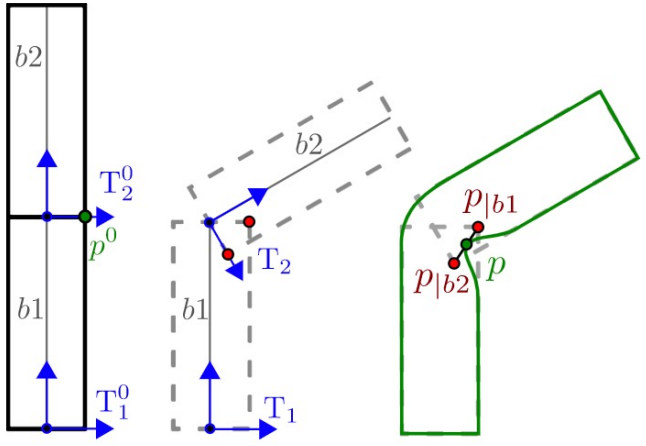
Linear interpolation of positions b/w associated joints

Example at middle vertex position of a bending cylinder

$$p = 0.5\, p_{|b1} + 0.5\, p_{|b2}$$

$$p = 0.5 \underbrace{\mathrm{T}_1 \left(\mathrm{T}_1^0\right)^{-1}}_{\mathrm{M}_1} p^0 + 0.5 \underbrace{\mathrm{T}_2 \left(\mathrm{T}_2^0\right)^{-1}}_{\mathrm{M}_2} p^0$$

$$p = \left(0.5\, \mathrm{M}_1 + 0.5\, \mathrm{M}_2\right) p^0$$



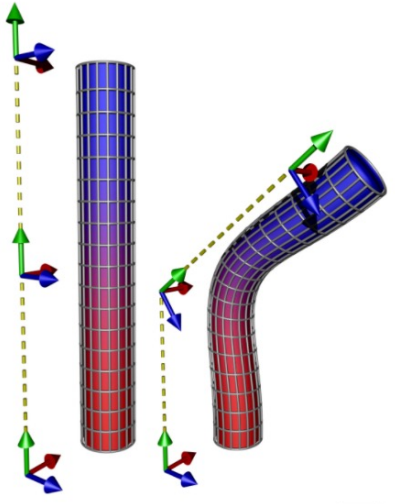
Can be generalized to arbitrary interpolation between two bones

$$p = \alpha\, p_{|b1} + (1-\alpha)\, p_{|b2} = \left(\alpha \mathrm{M}_1 + (1-\alpha)\, \mathrm{M}_2\right)\, p^0$$

α: skinning weights

Can be generalized to any number of bones

$$p = \sum_{k=0}^{N-1} \alpha_k\, p_{|bk} = \left(\sum_{k=0}^{N-1} \alpha_k\, \mathrm{M}_k\right)\, p^0 \,, \quad \sum_k \alpha_k = 1$$



Skinning

Smooth Skinning / Linear Blend Skinning

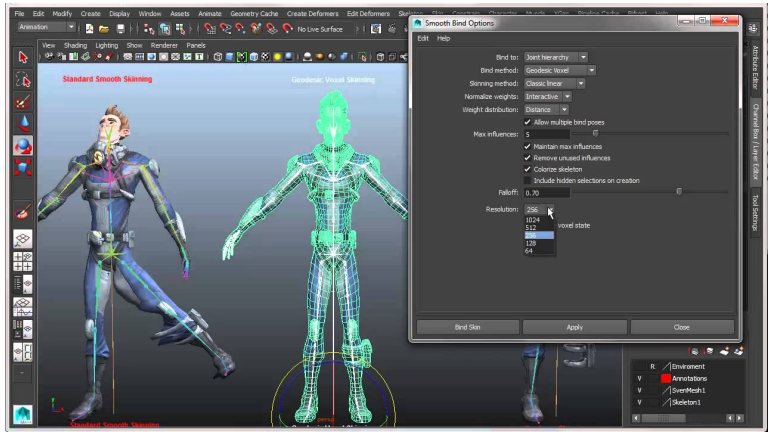
Linear interpolation of positions b/w associated joints

$$p = \left(\sum_{k=0}^{N-1} \alpha_k \, \mathrm{M}_k \right) p^0 = \left(\sum_{k=0}^{N-1} \alpha_k \, \mathrm{T}_k \, (\mathrm{T}_k^0)^{-1} \right) p^0$$

$$\forall k \, , \; \alpha_k \in [0, 1], \text{and} \sum_{k=0}^{N-1} \alpha_k = 1$$

The current standard for almost all articulated character deformation

- *Intuitive* deformation
- Controllable shape – through weights
- Very Fast – GPU compatible
  Matrix/vector operations



Skinning

Smooth Skinning / Linear Blend Skinning

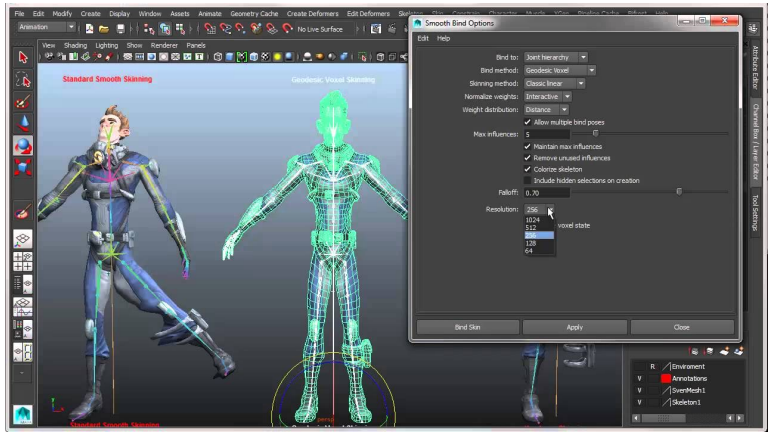
Linear interpolation of positions b/w associated joints

$$p = \left(\sum_{k=0}^{N-1} \alpha_k \, \mathrm{M}_k \right) p^0 = \left(\sum_{k=0}^{N-1} \alpha_k \, \mathrm{T}_k \, (\mathrm{T}_k^0)^{-1} \right) p^0$$

$$\forall k \, , \; \alpha_k \in [0, 1], \text{and} \sum_{k=0}^{N-1} \alpha_k = 1$$

The current standard for almost all articulated character deformation

- *Intuitive* deformation
- Controllable shape – through weights
- Very Fast – GPU compatible
  Matrix/vector operations



Disclaimer:

- LBS has well known artifacts (collapsing elbow, candy wrapper, etc)
- Large number of improvements (Dual Quaternion, Pose Space, Delta Mush, Implicit Skinning, PBD, Multi-weights, etc)

> *Out of our scope*
> *Aims to work on the simplest skinning method*
> *Not all of improvements compatible with standard Pipeline*

Skinning

Smooth Skinning / Linear Blend Skinning

Linear interpolation of positions b/w associated joints

$$p = \left(\sum_{k=0}^{N-1} \alpha_k \, \mathrm{M}_k \right) p^0 = \left(\sum_{k=0}^{N-1} \alpha_k \, \mathrm{T}_k \, (\mathrm{T}_k^0)^{-1} \right) p^0$$

$$\forall k \, , \; \alpha_k \in [0, 1], \text{and} \sum_{k=0}^{N-1} \alpha_k = 1$$

The current standard for almost all articulated character deformation

- *Intuitive* deformation
- Controllable shape – through weights
- Very Fast – GPU compatible
  Matrix/vector operations

At the "heart" of the **Animation PipeLine**

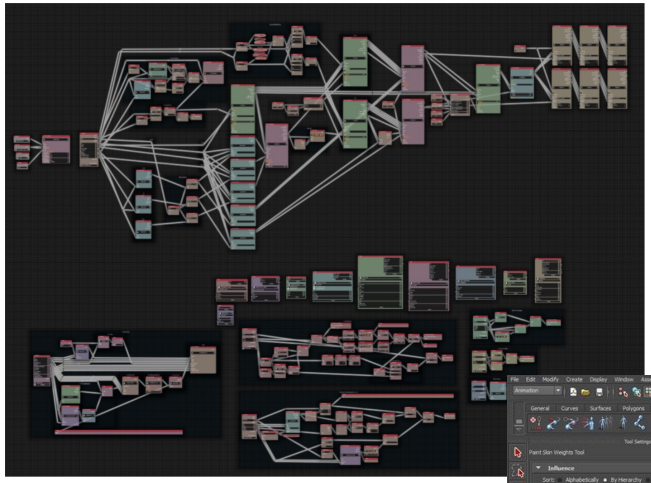
Skeleton & skinning weights are Artists Inputs

Avoid method modifying the Rig

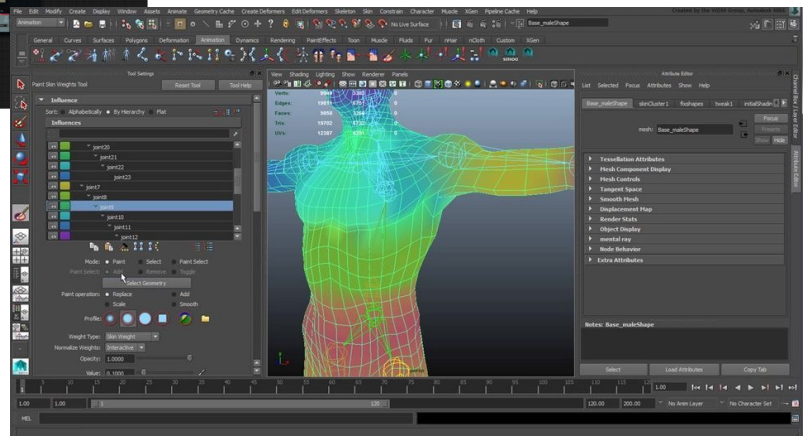
- Rigs can be very complex

- Companies developed years of expertise

(example of Rig)



(weights painting interface)



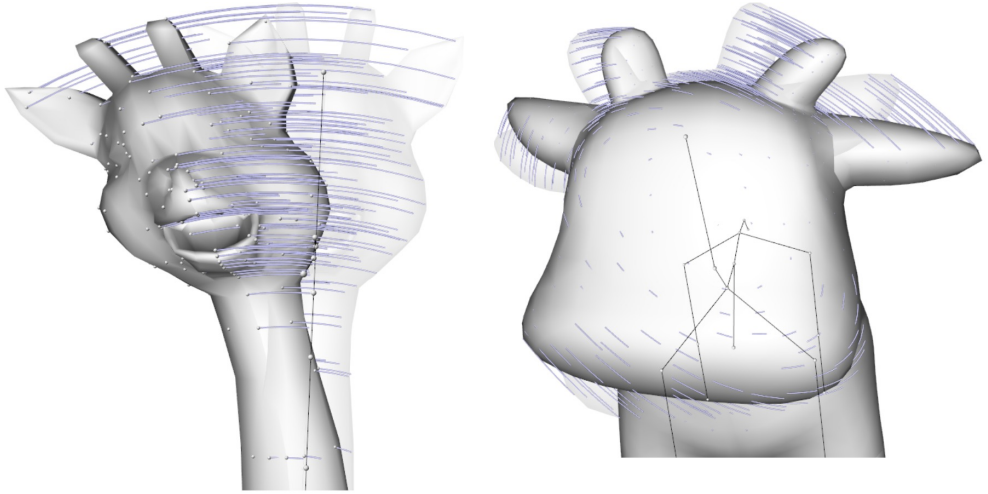
Velocity Skinning

Note - Skinning only computes static key-framed pose

Lots of interesting deformation effect come from velocity

Question - Can we integrate the **velocity** in the **skinning**

Objective - Automatic **Drag** & **Stretch** deformer



Constraints

Real time

10^6 triangles

Work "Out of the box"

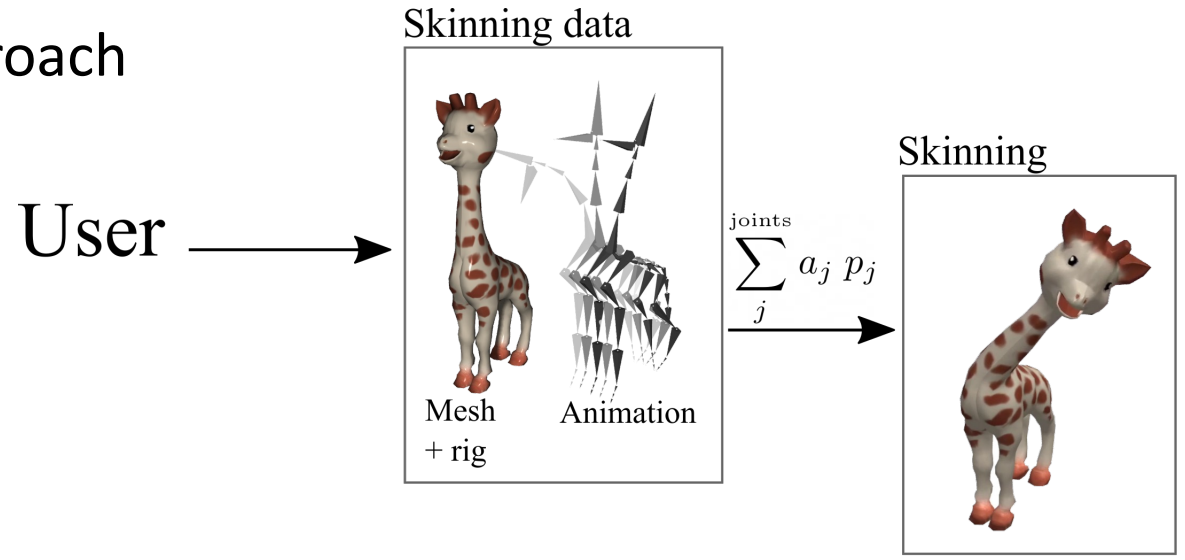
with user control

"Non-Linear" time edits



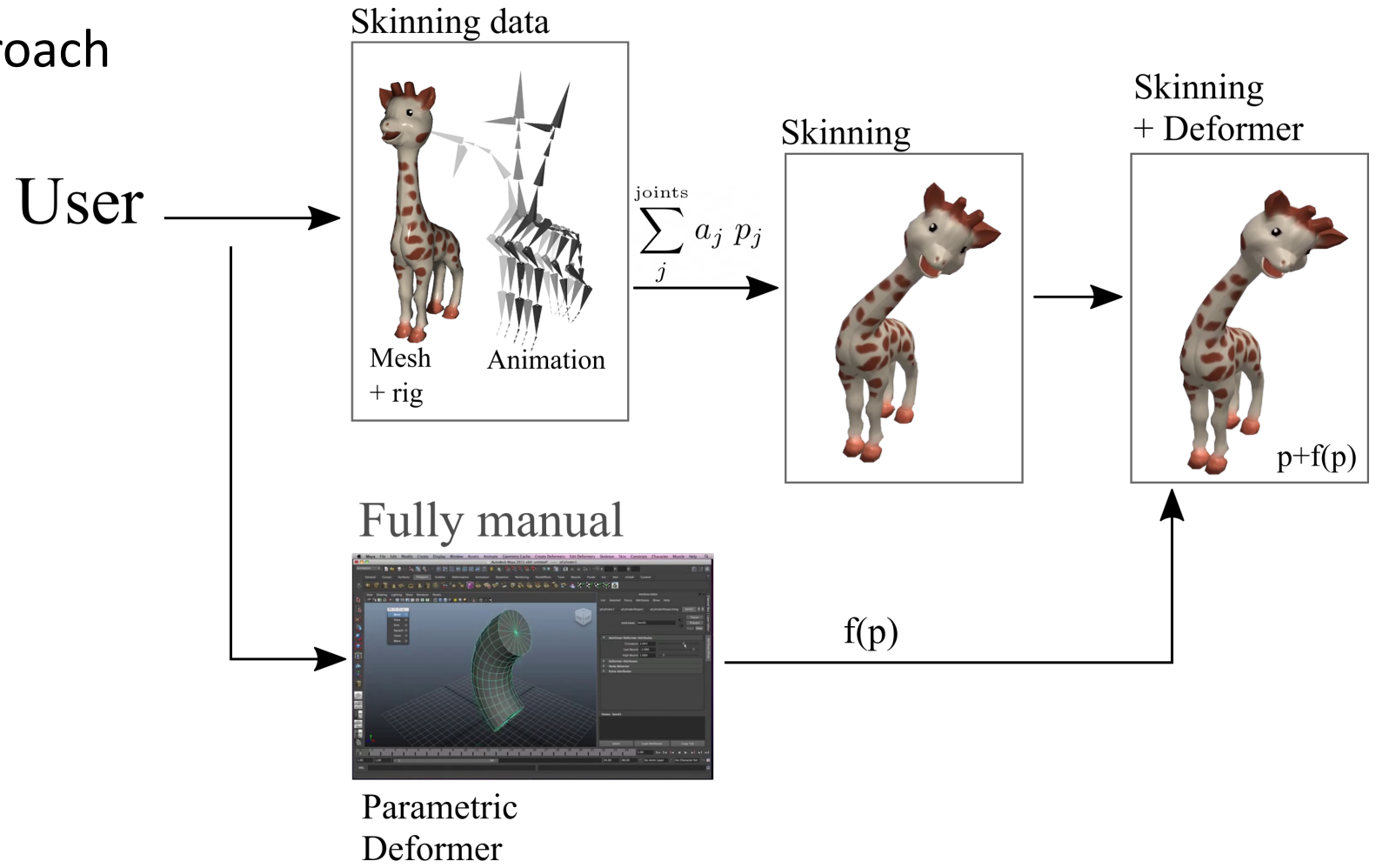
Velocity Skinning

Standard approach



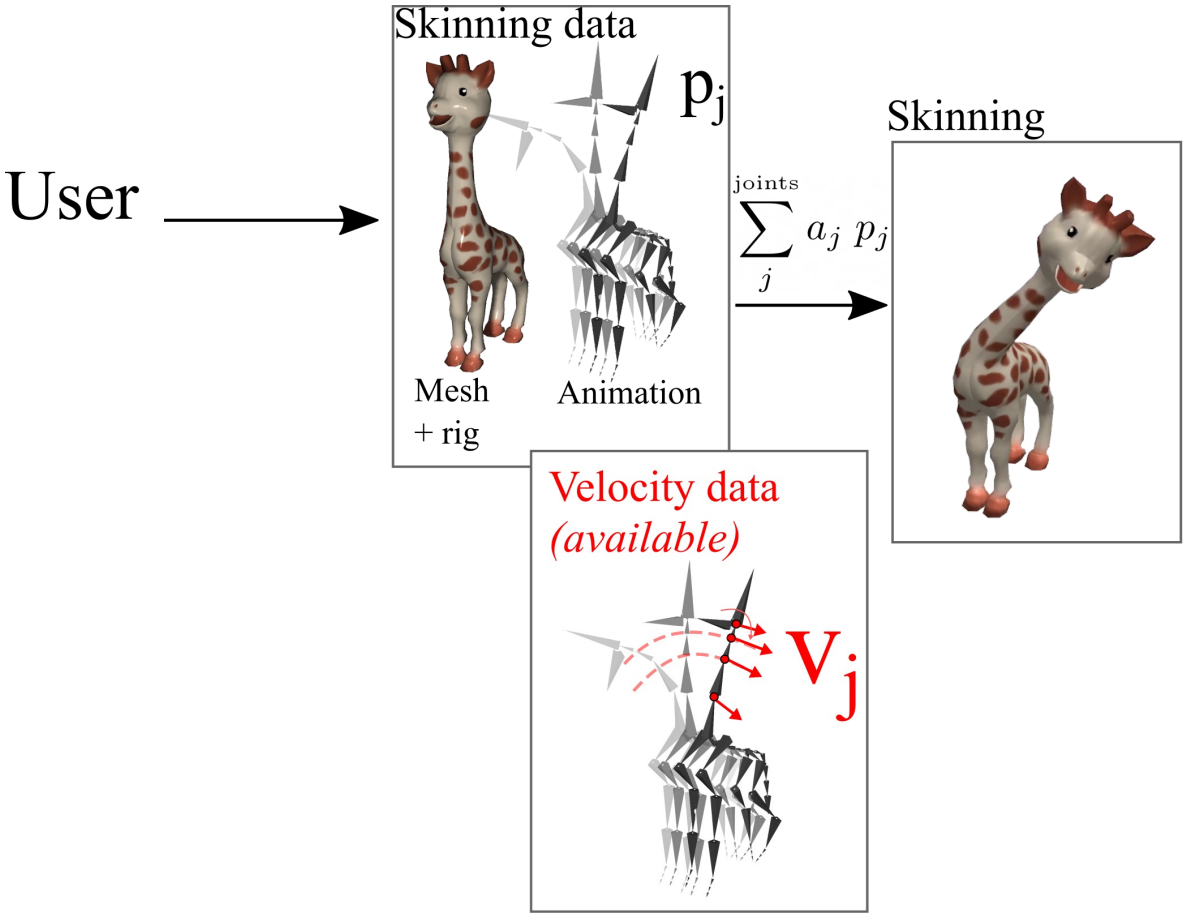
Velocity Skinning

Standard approach



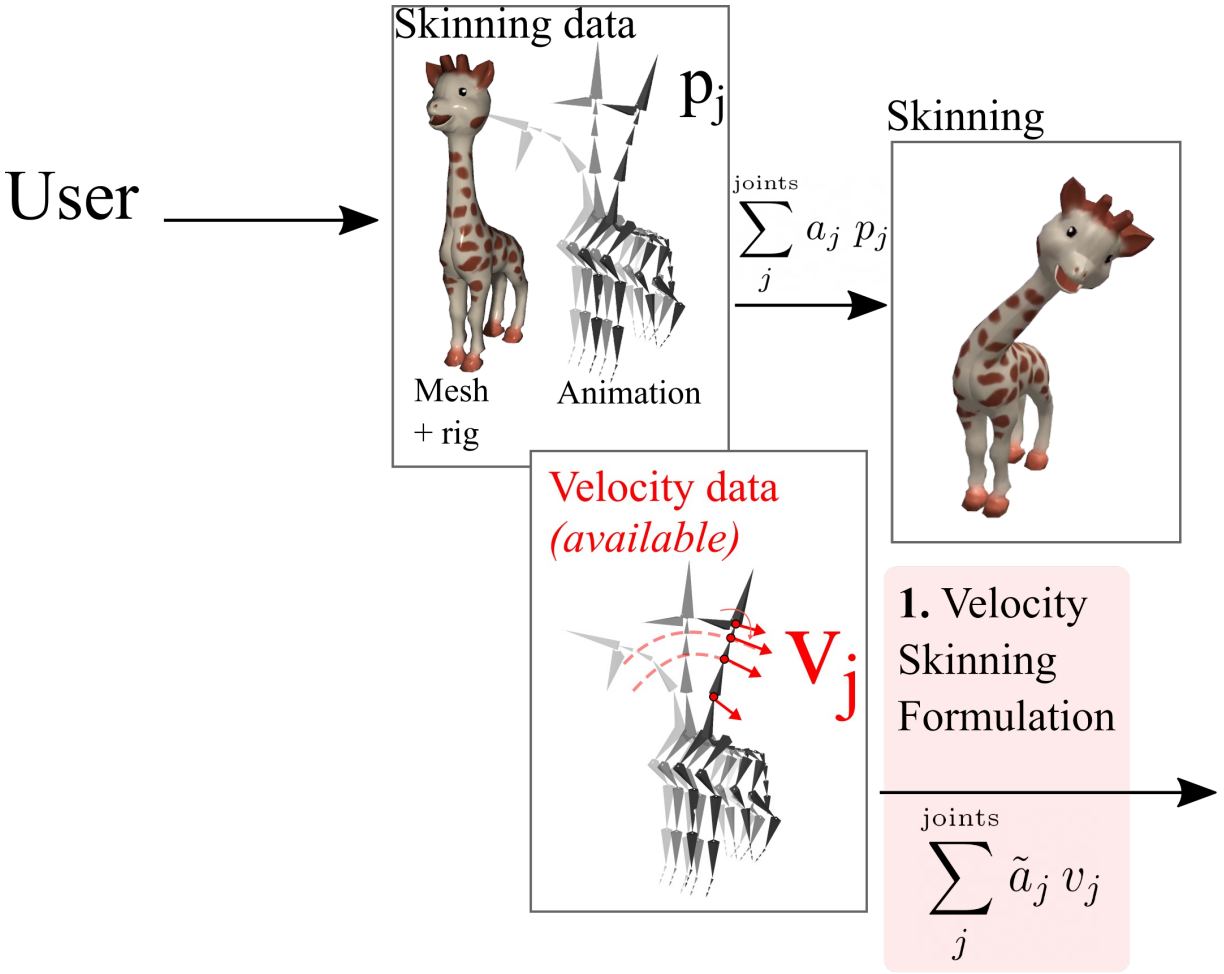
Velocity Skinning

Our proposition



Velocity Skinning

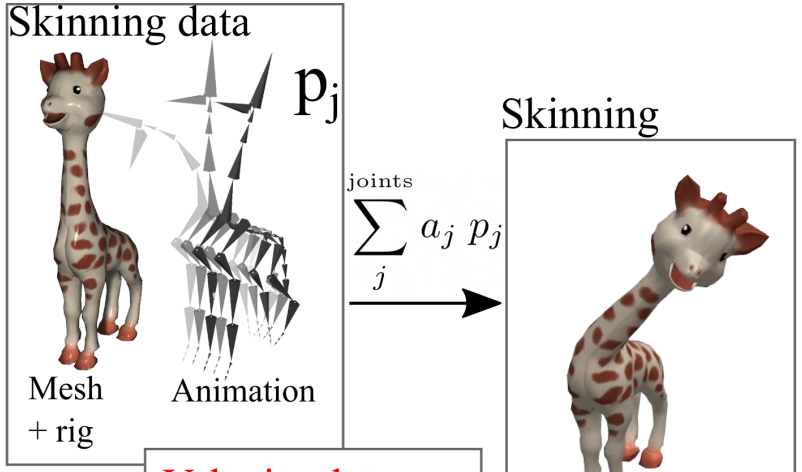
Our proposition



Velocity Skinning

Our proposition

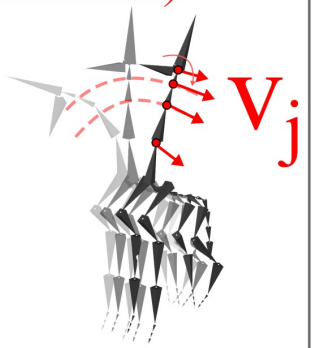
User



$$\sum_{j}^{\text{joints}} a_j \, p_j$$

Skinning

Velocity data
(available)



1. Velocity Skinning Formulation

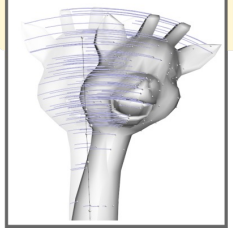
$$\sum_{j}^{\text{joints}} \tilde{a}_j \, v_j$$

2. Velocity Skinning Deformation

Drag & Stretch

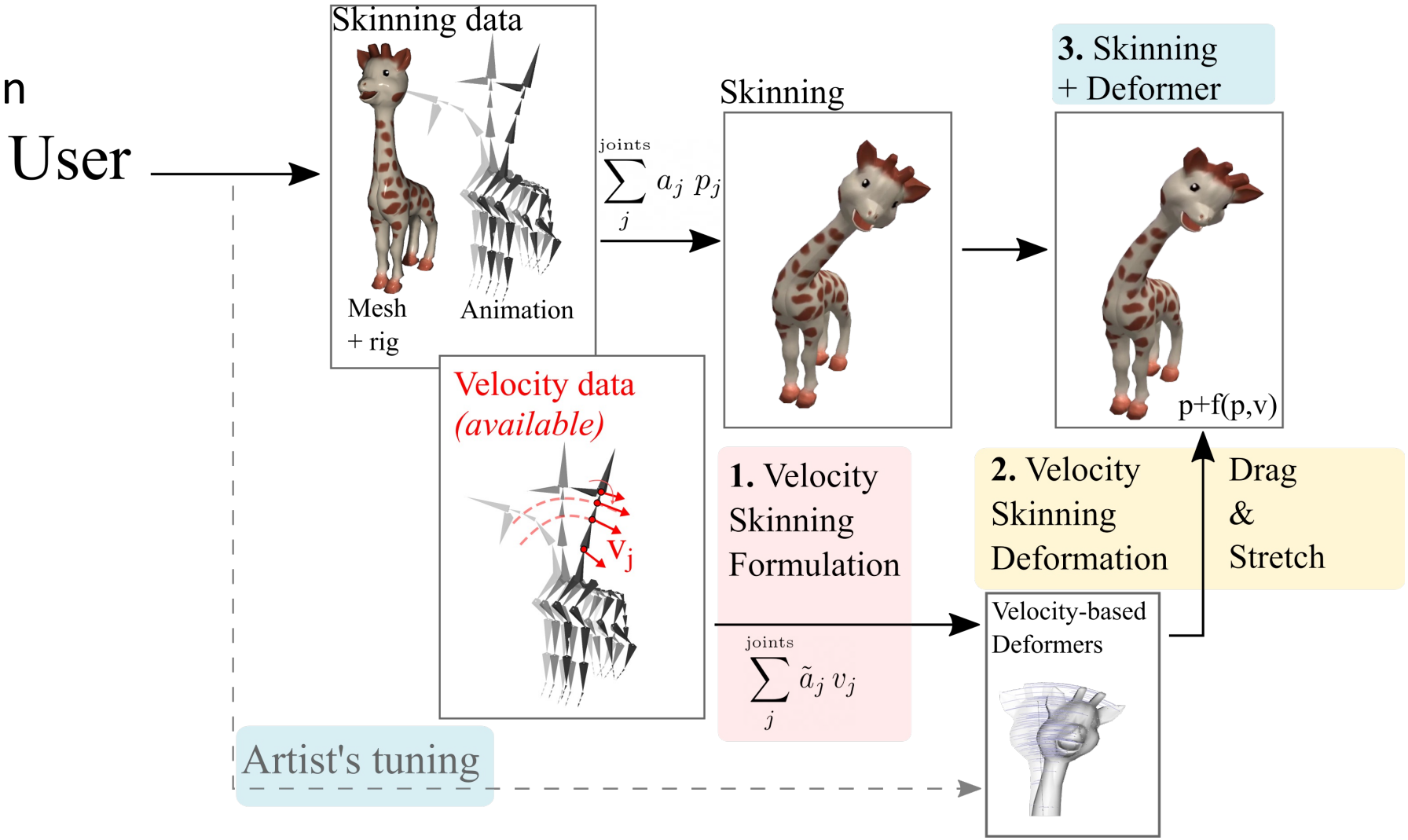
$$\sum_{j}^{\text{joints}} \tilde{a}_j \, \psi(v_j)$$

Velocity-based Deformers



Velocity Skinning

Our proposition



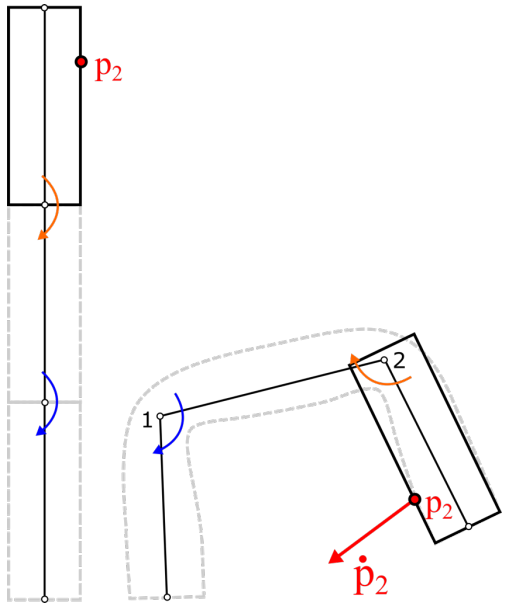
Velocity Skinning Formulation

- Standard LBS

$$p = \sum_{joints\ j} a_j\ p_j$$

- Differentiating

$$v(p) = \dot{p} = \sum_{joints\ j} a_j\ \dot{p}_j$$



Velocity Skinning Formulation

- Standard LBS

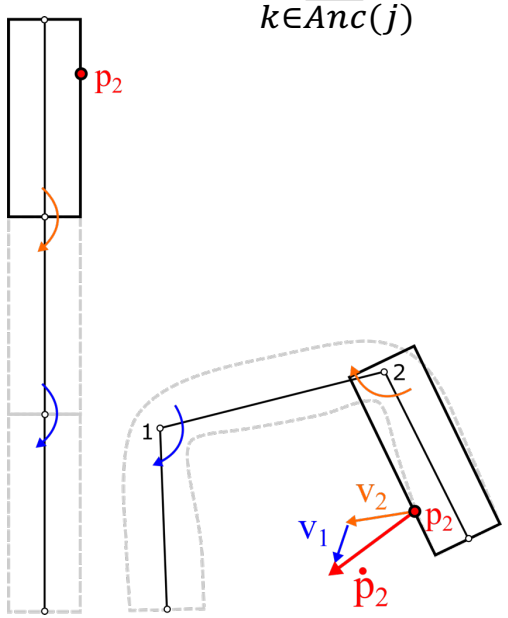
$$p = \sum_{joints\ j} a_j\, p_j$$

- Differentiating

$$v(p) = \dot{p} = \sum_{joints\ j} a_j\, \dot{p}_j$$

Decompose $\dot{p}$ along the hierarchy

$$\dot{p}_j = \sum_{k \in Anc(j)} v_k$$



Velocity Skinning Formulation

- Standard LBS

$$p = \sum_{joints\ j} a_j\ p_j$$

- Differentiating

$$v(p) = \dot{p} = \sum_{joints\ j} a_j\ \dot{p}_j$$

Decompose $\dot{p}$ along the hierarchy $\longrightarrow$

$$\dot{p}_j = \sum_{k \in Anc(j)} v_k$$

- Skinning in velocity

$$v(p) = \sum_{joints\ j} a_j \left(\sum_{k \in Anc(j)} v_k \right)$$

$$v(p) = \sum_{joints\ j} \tilde{a}_j\ v_j$$

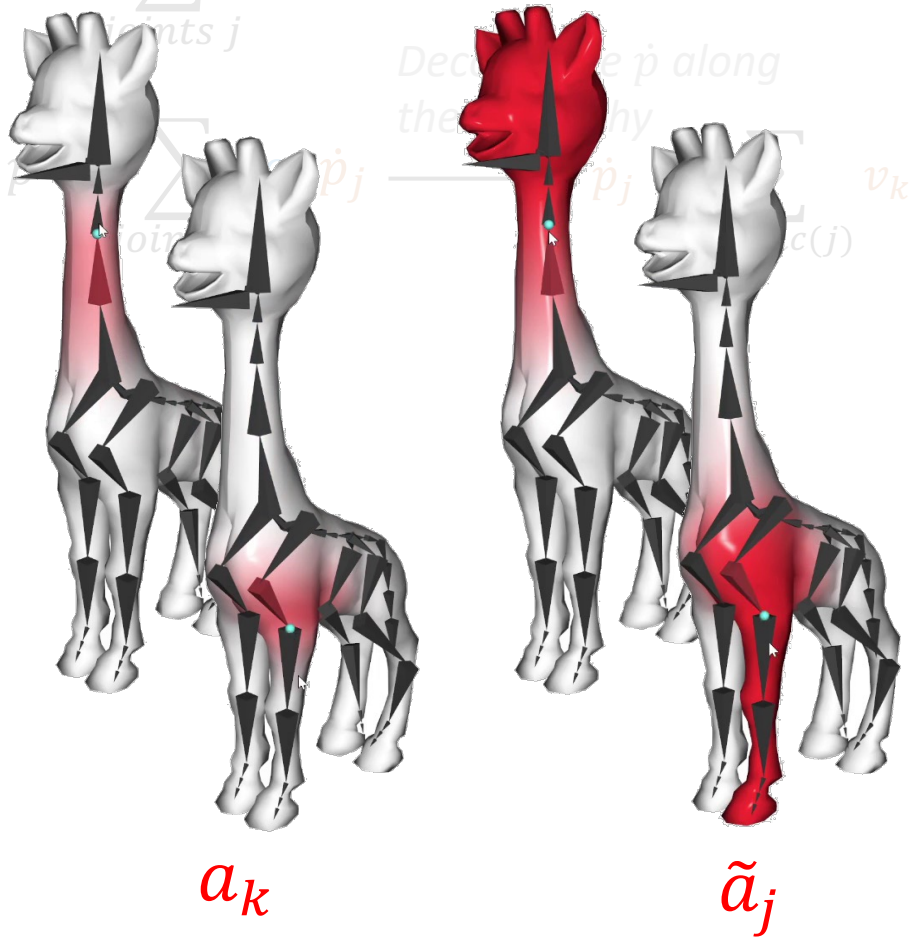
with $$\tilde{a}_j = \sum_{k \in Desc(j)} a_k$$

Velocity Skinning Formulation

- Standard LBS
- Differentiating
- Skinning in velocity

$$v(p) = \sum_{joints\ j} \tilde{a}_j\ v_j$$

with $\tilde{a}_j = \sum_{k \in Desc(j)} a_k$



Velocity Skinning Deformation

$$v(p) = \sum_{joints\ j} \tilde{a}_j\, v_j(p) \quad = \sum_j \tilde{a}_j \left(u_j + \omega_j (p - proj_j) \right)$$

Velocity to deformation

$$d(p) = \sum_{joints\ j} \tilde{a}_j\, \psi_j(p) \quad = \sum_j \tilde{a}_j \left(\psi_{u_j} + \psi_{\omega_j}(p) \right)$$

Final position: $q = p + d(p)$

$$q = p + \sum_{joints\ j} \psi_{u_j}^{drag} + \psi_{\omega_j}^{drag} + \psi_{u_j}^{stretch} + \psi_{\omega_j}^{stretch}$$

skinning — *velocity skinning*

How to choose the deformer functions ψ ?

Drag deformer

- **Linear velocity** u_j

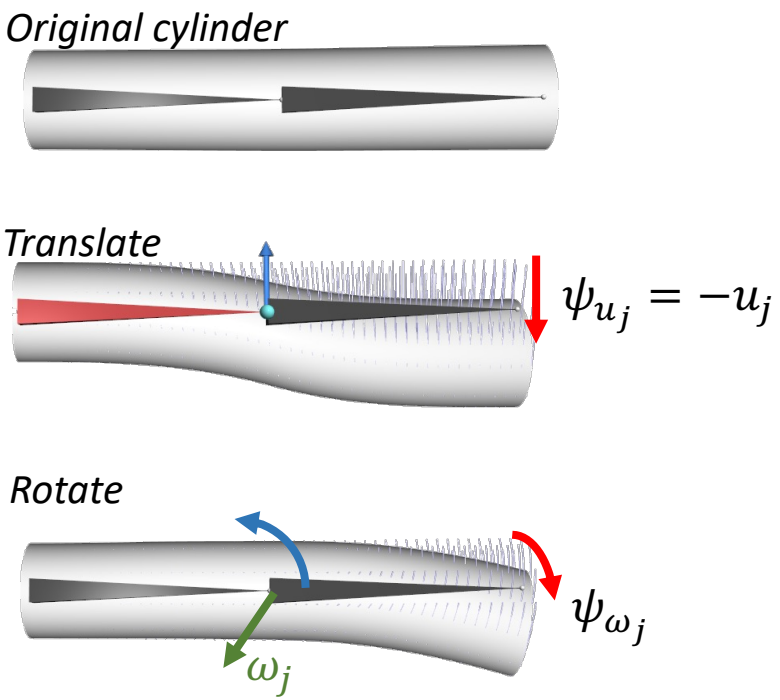
  $\psi_{u_j}^{drag}$: translation $-u_j$

- **Angular velocity** ω_j

  $\psi_{\omega_j}^{drag}$: rotation around ω_j

  Axis: ω_j

  Angle: $\theta = -\left\|\omega_j\,(p - proj_j)\right\|$



Stretch deformer

- Central axis of stretch
- Stretching/Squeezing deformation

Linear velocity

$\psi_{u_j}^{stretch}$ Homogeneous Scaling



Angular velocity

$\psi_{u_j}^{stretch}$ Anisotropic Scaling



Results

[Rohmer et al., Velocity Skinning for Real-time Stylized Skeletal Animation, Eurographics 2021]

https://velocityskinning.com



Original Mesh



Standard Skinning



Our Results
Velocity Skinning

Results

[Rohmer et al., Velocity Skinning for Real-time Stylized Skeletal Animation, Eurographics 2021]

https://velocityskinning.com



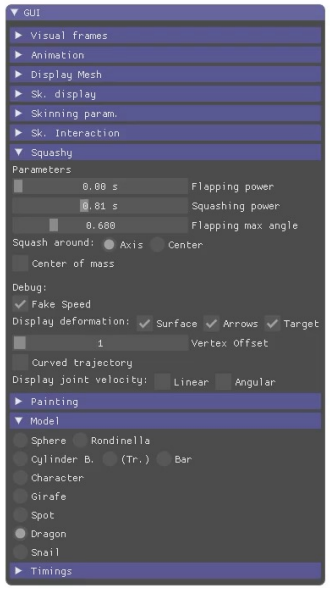
Standard Skinning

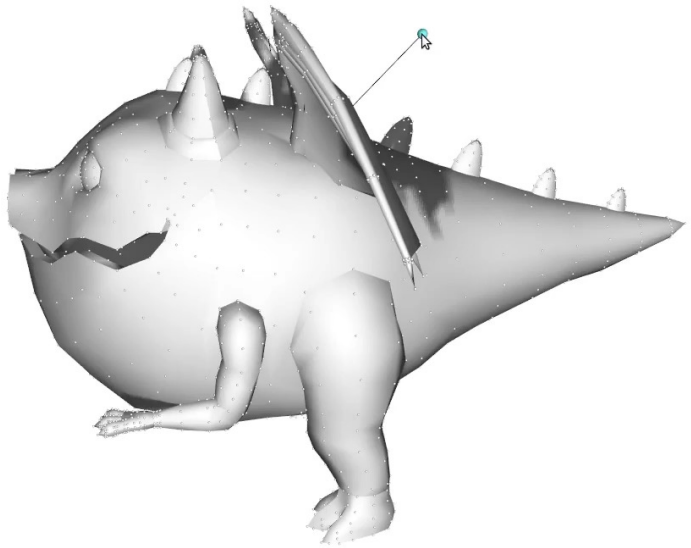


Velocity Skinning

Results – User controls

$$\psi_{\omega_j}\colon \theta = -\alpha_j(\mathrm{p})\ \left\|\omega_{\mathrm{j}}\ (\mathrm{p}-\mathrm{p_j}\ )\right\| \qquad \psi_{u_j} = -\beta_j\ (\mathrm{p})\ u_j$$





Deformation Visualizer

Results – Computational Time

Large mesh

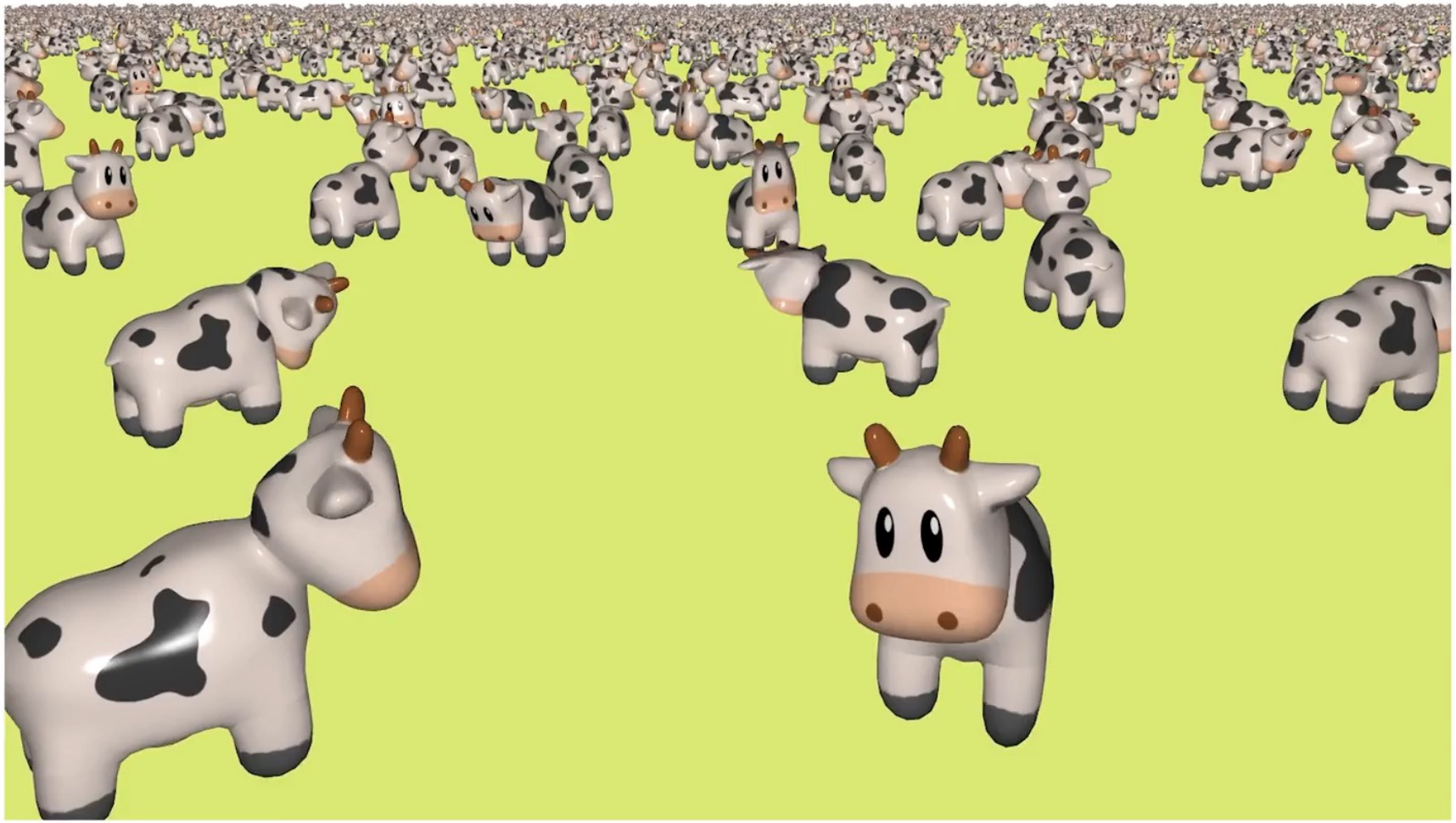
1.5 Million triangles
< 37ms/frame



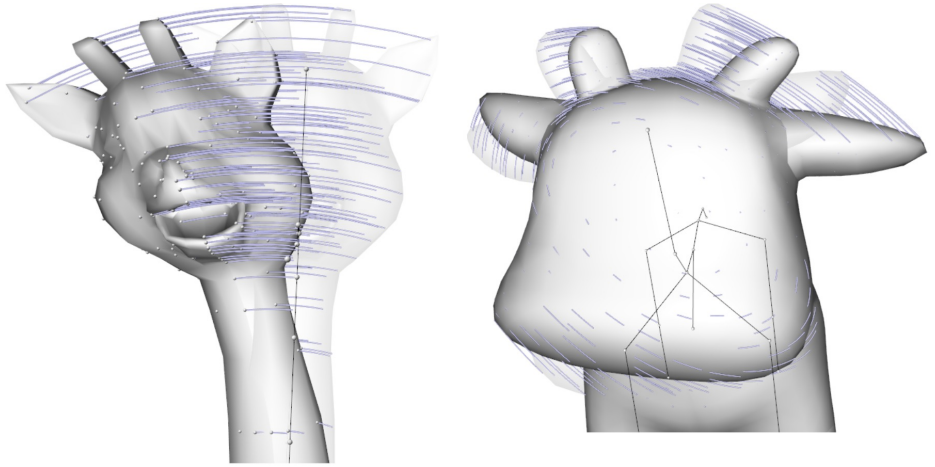
Results – Computational Time

Multiple instances

4000 cows,
5800 triangles/cow
<40 ms/frame



Wrap up / Limitations



(+) Very simple approach

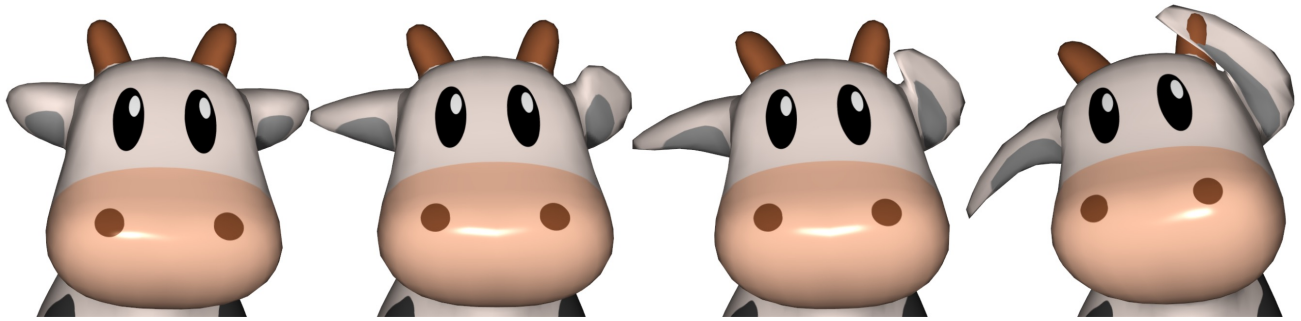
(+) Real-time, no iterations (fully predictible)

(+) No history needed

(-) Non physics deformation

No real inertia, action/reaction, linear blend of deformation

(-) Intersection

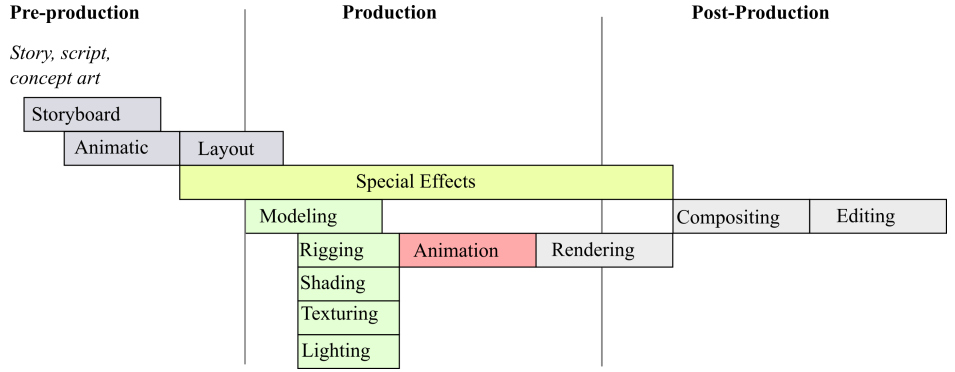


(-) Hierarchy propagation

Conclusion – Expressive animations

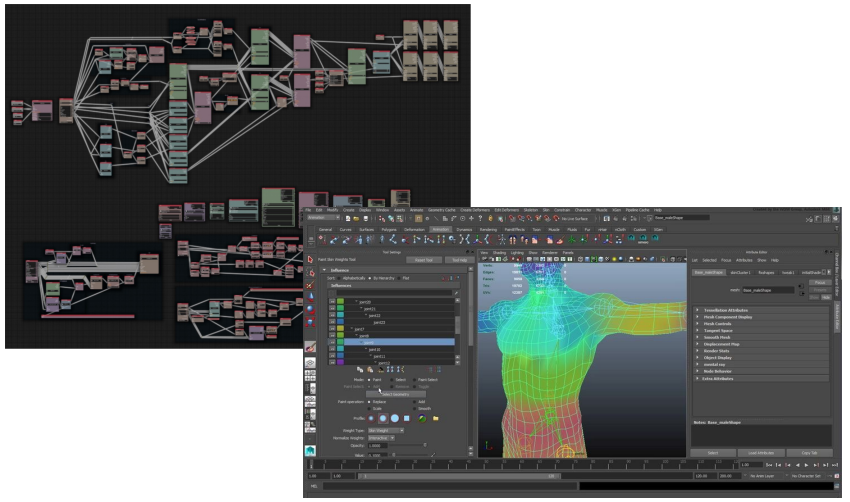
Expressive animation: wide subjective domain

- *Almost “everything” can be done manually*
- *But could often be more efficiently (/less painfully) done*

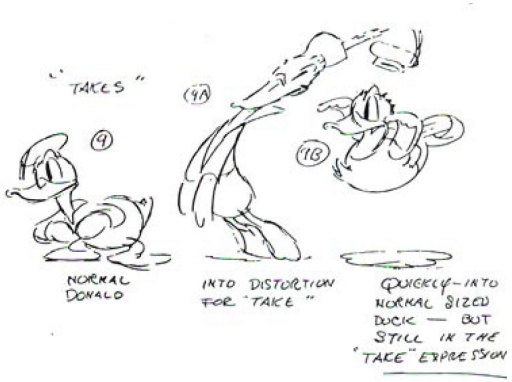


Trade-off from physics inspiration & artistic view

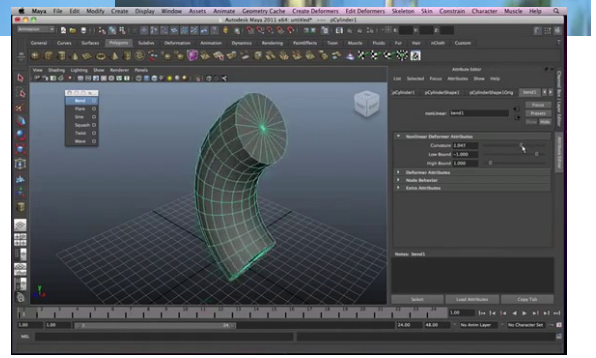
- *Be open to animator worlds/references*
- *Considering production constraints -> unsolved problems*



Still challenging to link expressive design (input) with animation (output)


"TAKES"
NORMAL DONALD
INTO DISTORTION FOR "TAKE"
QUICKLY-INTO NORMAL SIZED DUCK — BUT STILL IN THE "TAKE" EXPRESSION





Thank you !

