



Character Skinning



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Some terms...

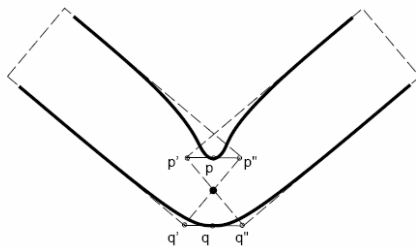
- rigging
 - given a mesh model, the process of creating a skeleton and then adding and binding the skin geometry
- skinning
 - given a character skin model, how should it move with the underlying skeleton ?
- techniques
 - model muscle and skeleton geometry, then add skin
 - linear blend skinning (a.k.a. SSD)
 - scattered-data interpolation

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Linear Skin Blending

- model vertex in a number of local coord frames

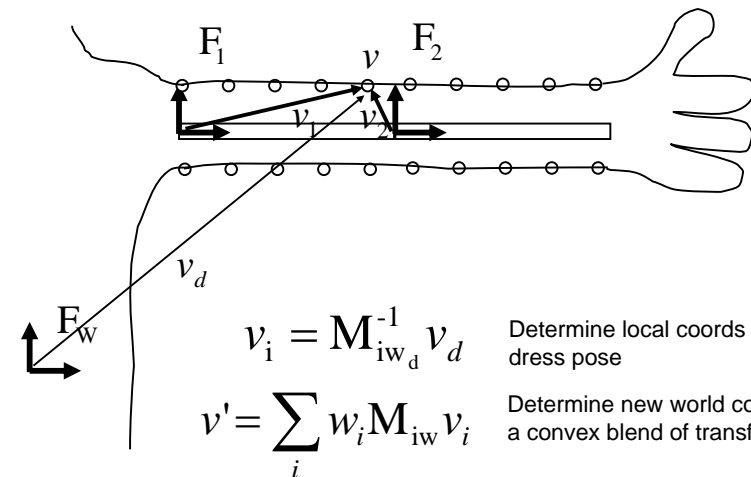


[J.P. Lewis et al., SIGGRAPH 2000]

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Linear Skin Blending



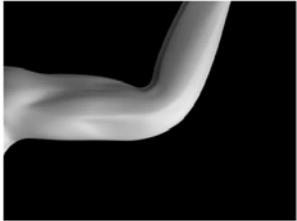
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Linear Skin Blending

- hardware support
- choosing weights ?
 - rules based on distances to joints
 - have an artist “paint” them on
- problems ...

$$w_i \propto \frac{1}{d_i}$$

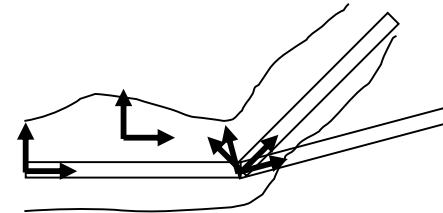


[J.P. Lewis et al., SIGGRAPH 2000]

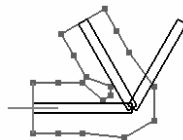
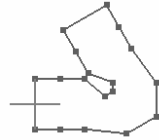
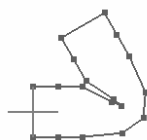
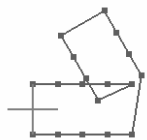
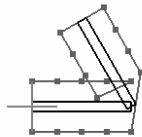
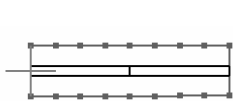


Linear Skin Blending

- fixes
 - add extra “virtual” bones (frames)



Linear Skin Blending



bind to closest link

linear blend with two links

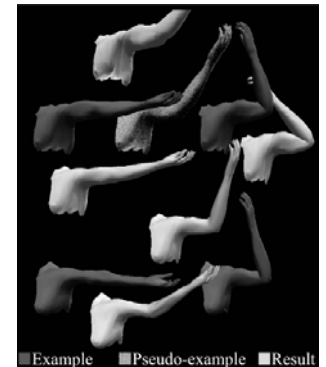
linear blend with three links

showing the extra link



Scattered Data Interpolation

- given example poses
 - automatically fit linear skin blend model $w_i v_d$
 - [Mohr & Gleicher 2003]
 - radial basis functions, etc.
 - [5 other papers on handout]



[Sloan et al., 2001]

Example Pseudo-example Result



Scattered Data Interpolation

- shape interpolation

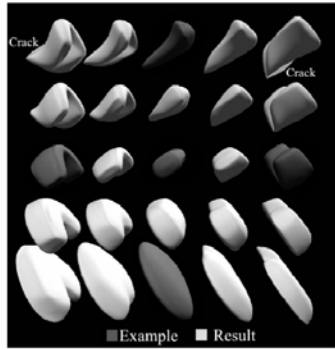


Figure 4: Exploration of the space can reveal problems with the interpolation.

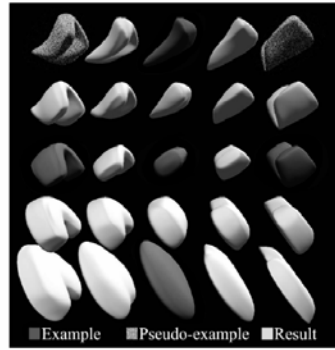


Figure 5: *Pseudo-examples* (the upper right and left corner forms) can reparameterize the space, fixing up problem regions.

[Sloan et al., 2001]