SIGGRAPH2010

Example-Based Wrinkle Synthesis for Clothing Animation

Huamin Wang
Florian Hecht
Ravi Ramamoorthi
James O'Brien

University of California, Berkeley

Clothes are important.

Clothing Classification

Data-Driven Method

Example:
[Allen et al. 2002]
[Mohr and Gleicher 2003]

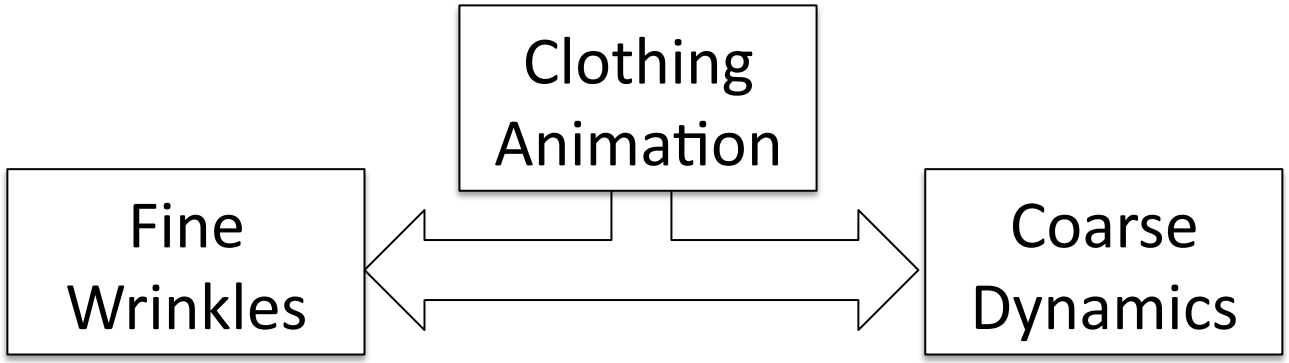
?

Cloth Simulation

Example:
[Baraff and Witkin 1998]
[Bridson et al. 2002]

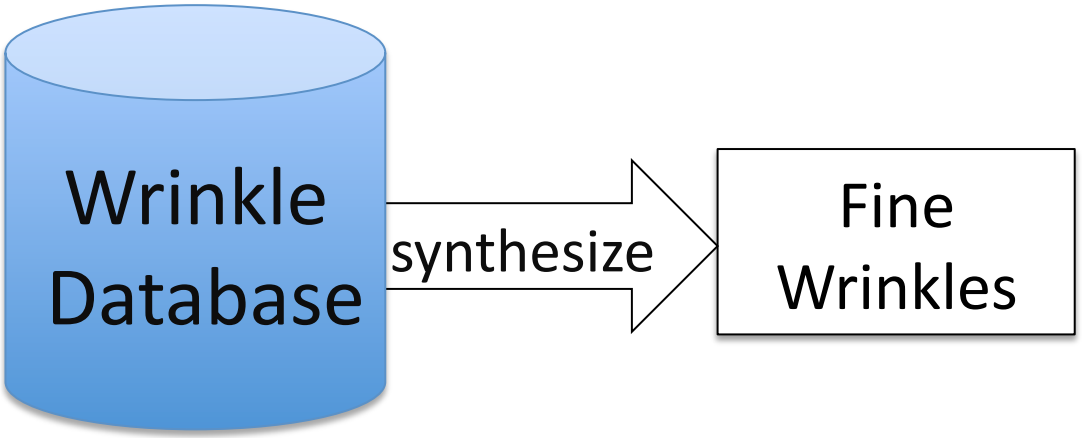
The pose decides cloth wrinkles.

Therefore:

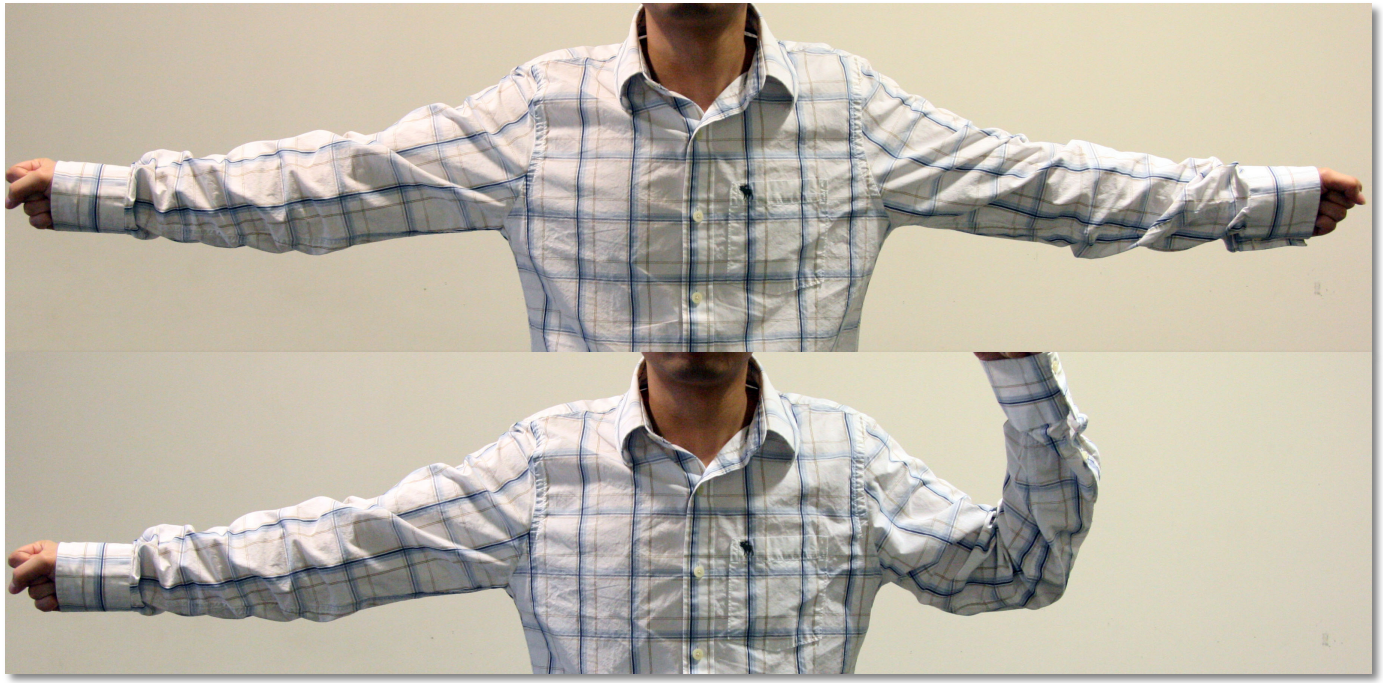


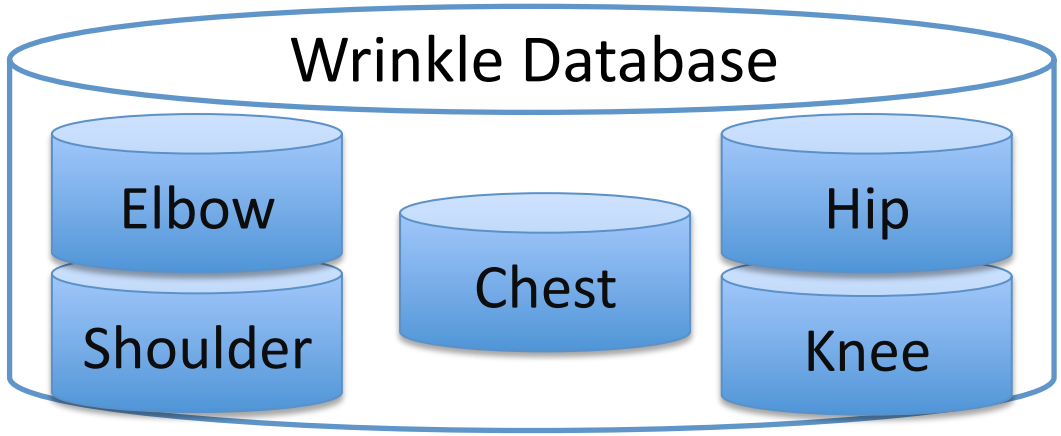
Same pose causes same wrinkles.

Therefore:

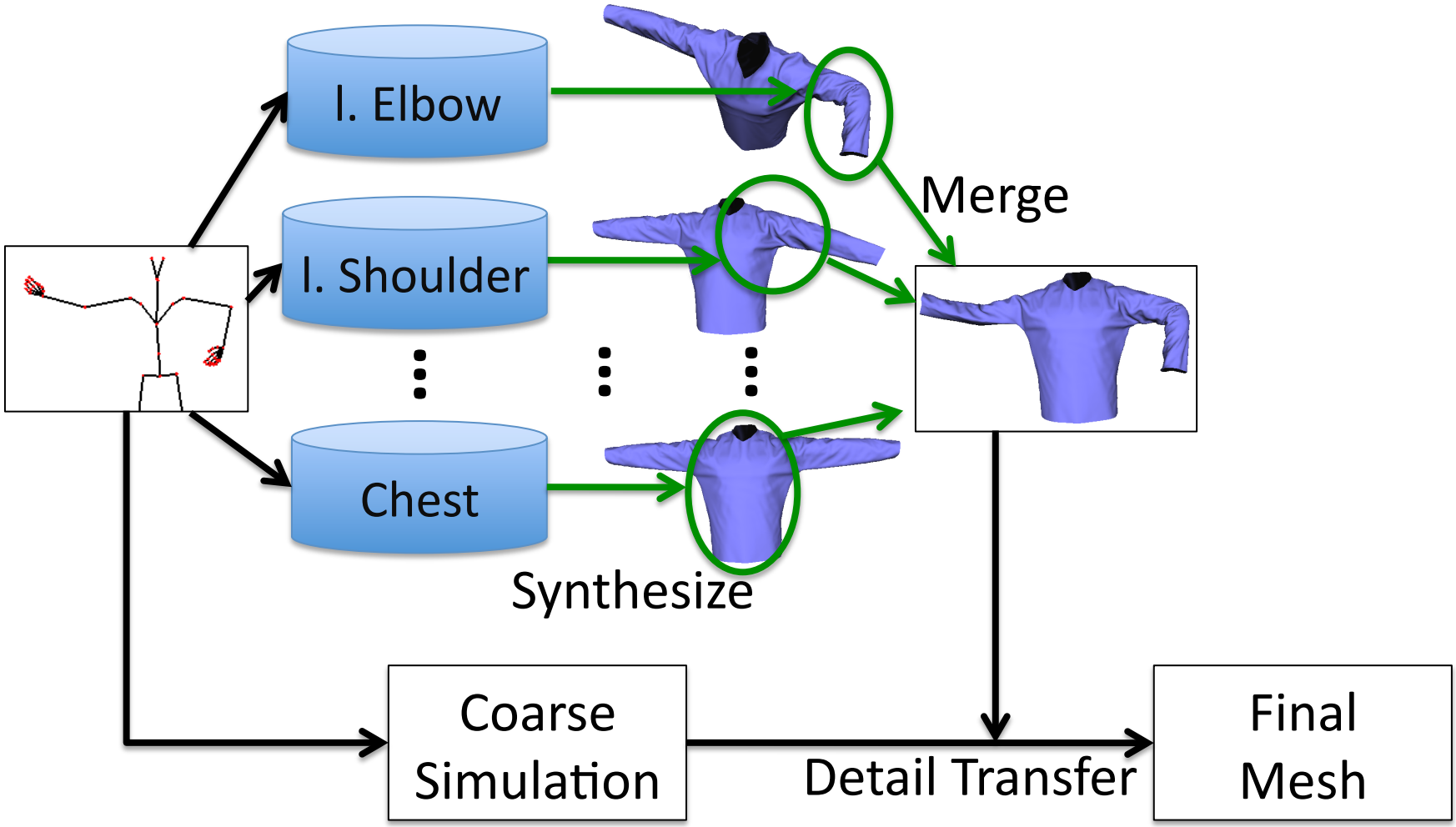


The joint affects wrinkles locally.



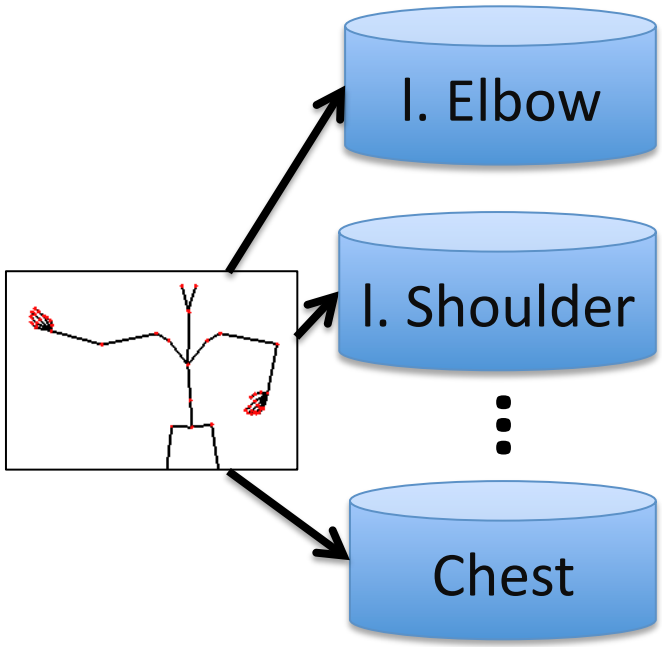


System Pipeline

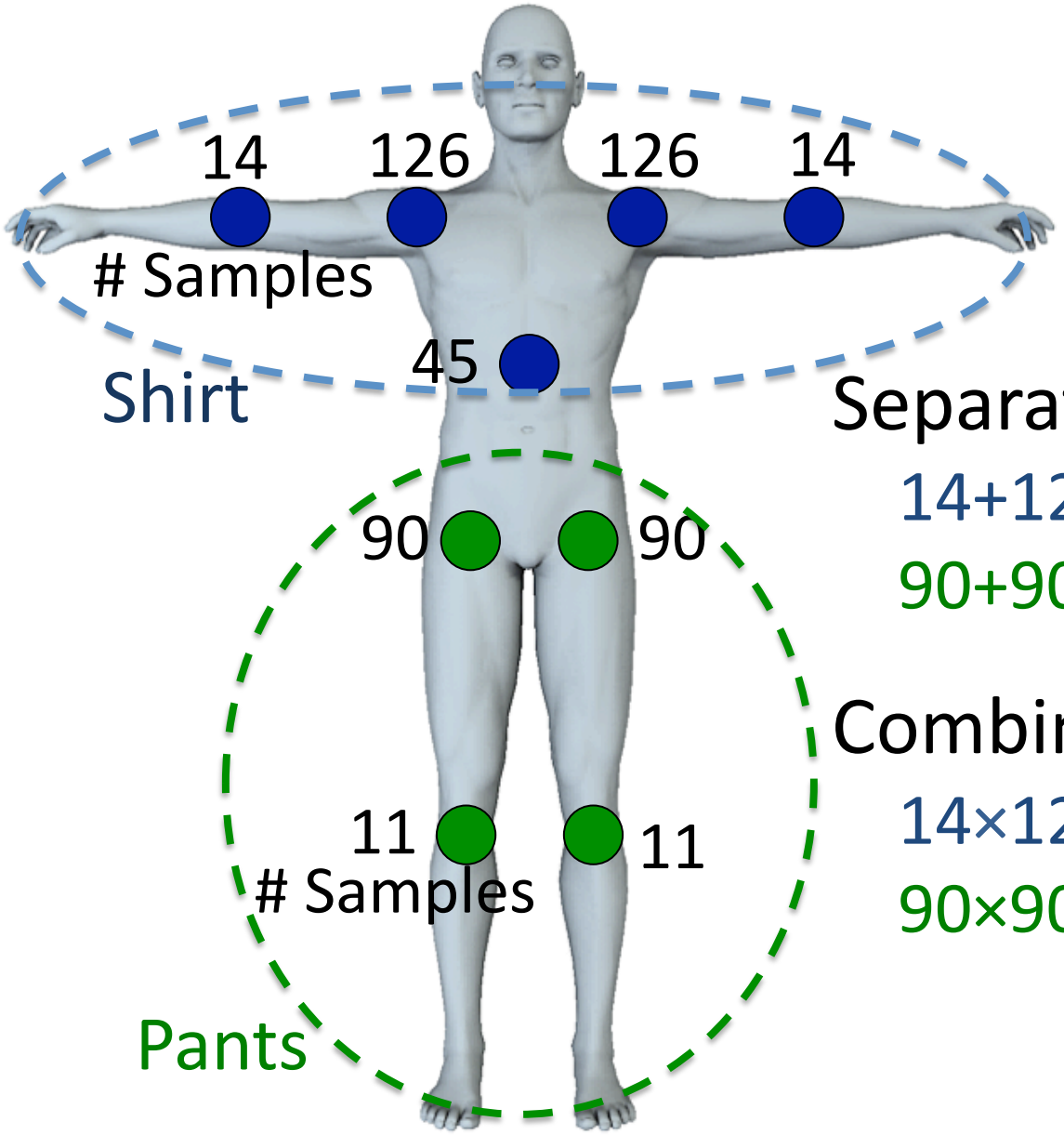


Kicking

System Pipeline



Database Construction



Separate Joint (our)

14+126+126+14+45=325

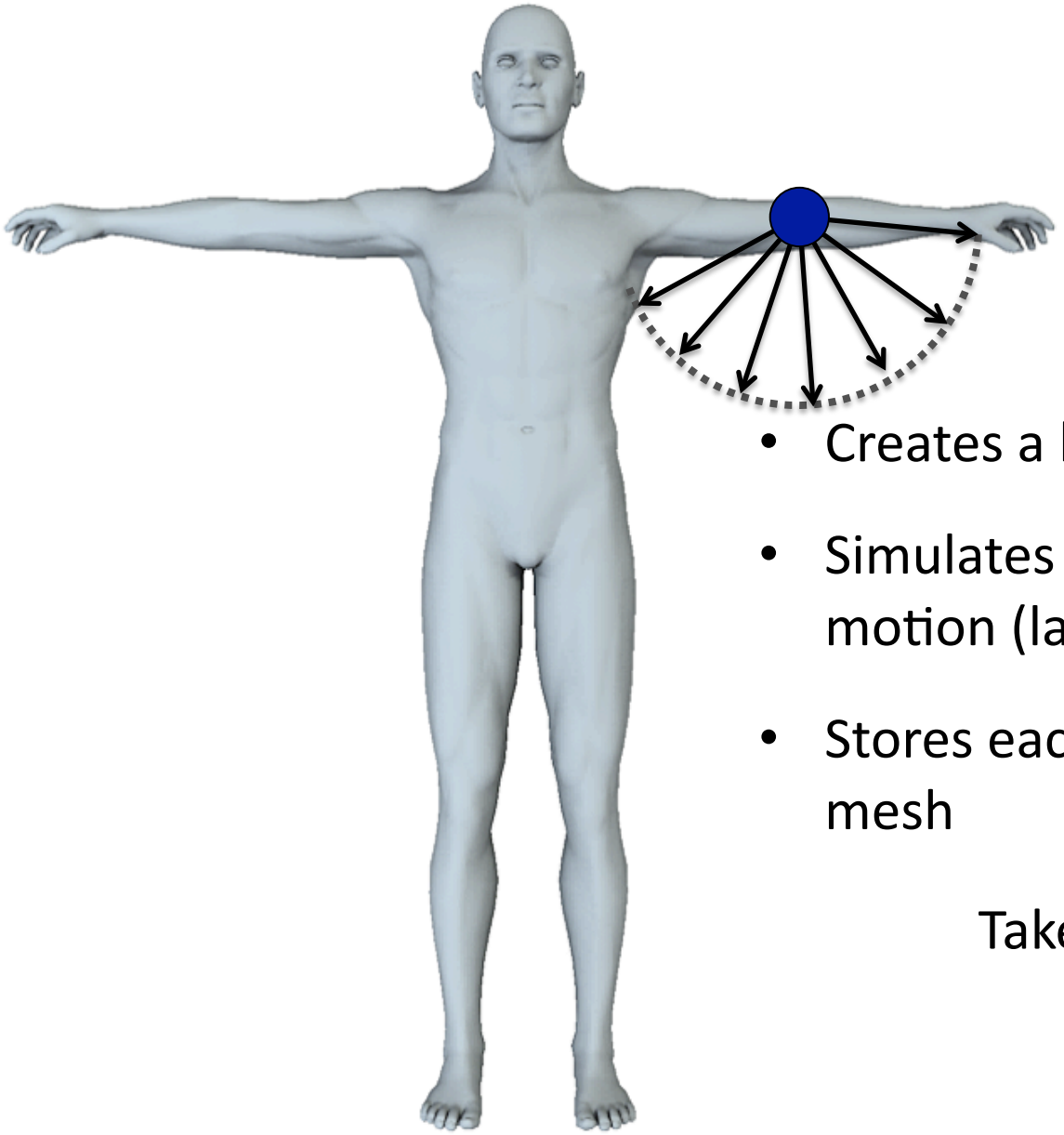
90+90+11+11=202

Combined Joint (bad)

14×126×126×14×45=140M

90×90×11×11=1M

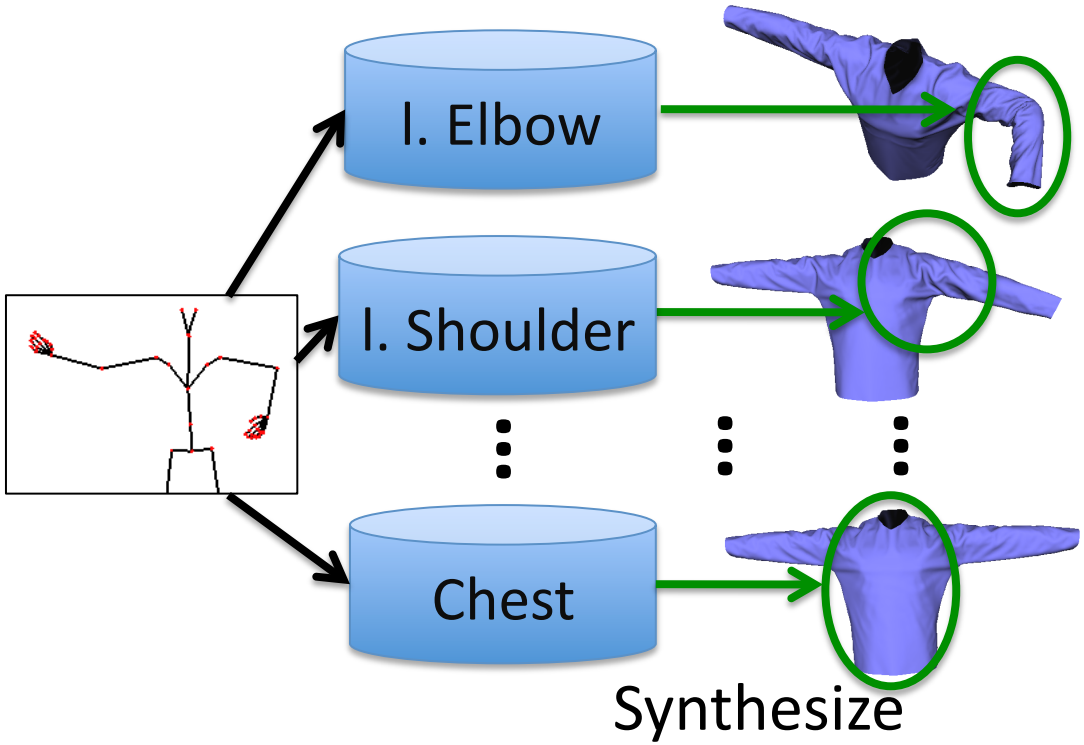
Database Construction



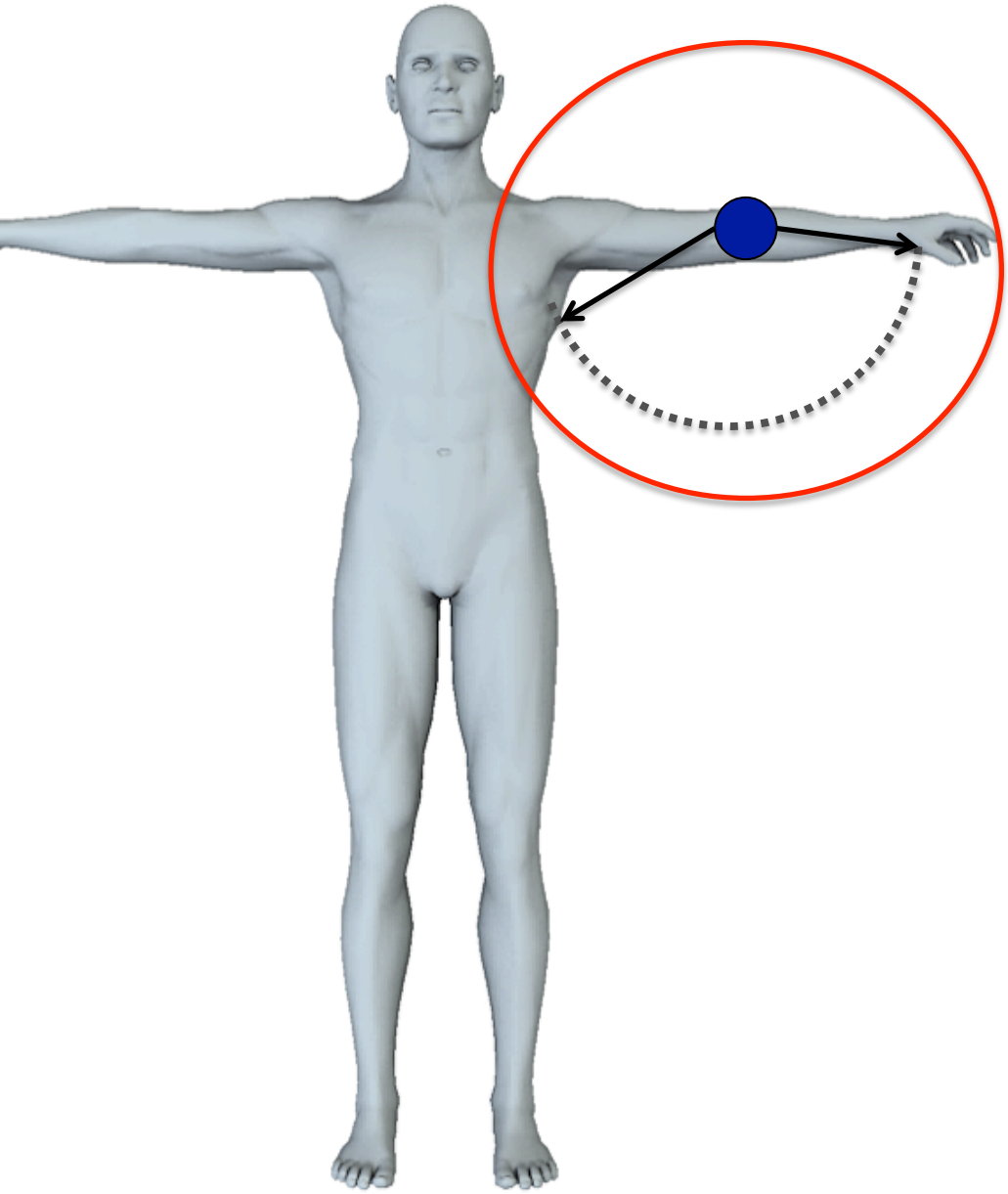
- Creates a body mesh sequence
- Simulates cloth with body motion (large damping)
- Stores each joint sample with its mesh

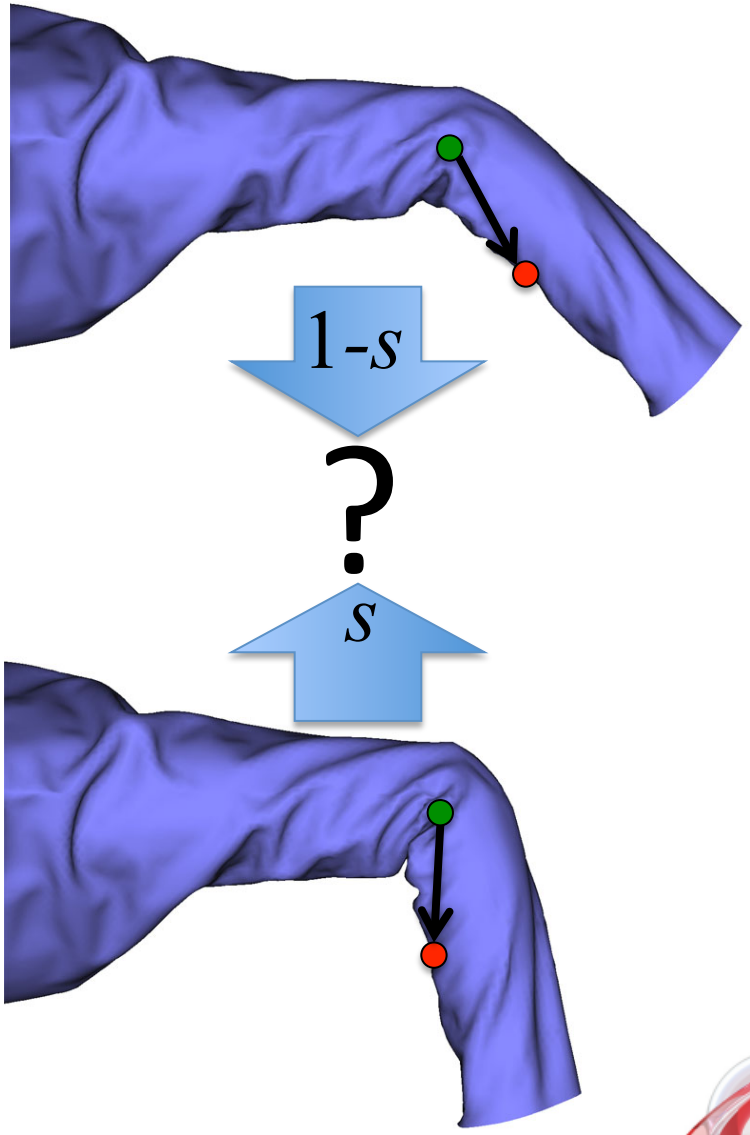
Takes 2 to 3 days.

System Pipeline



Intra-Joint Interpolation





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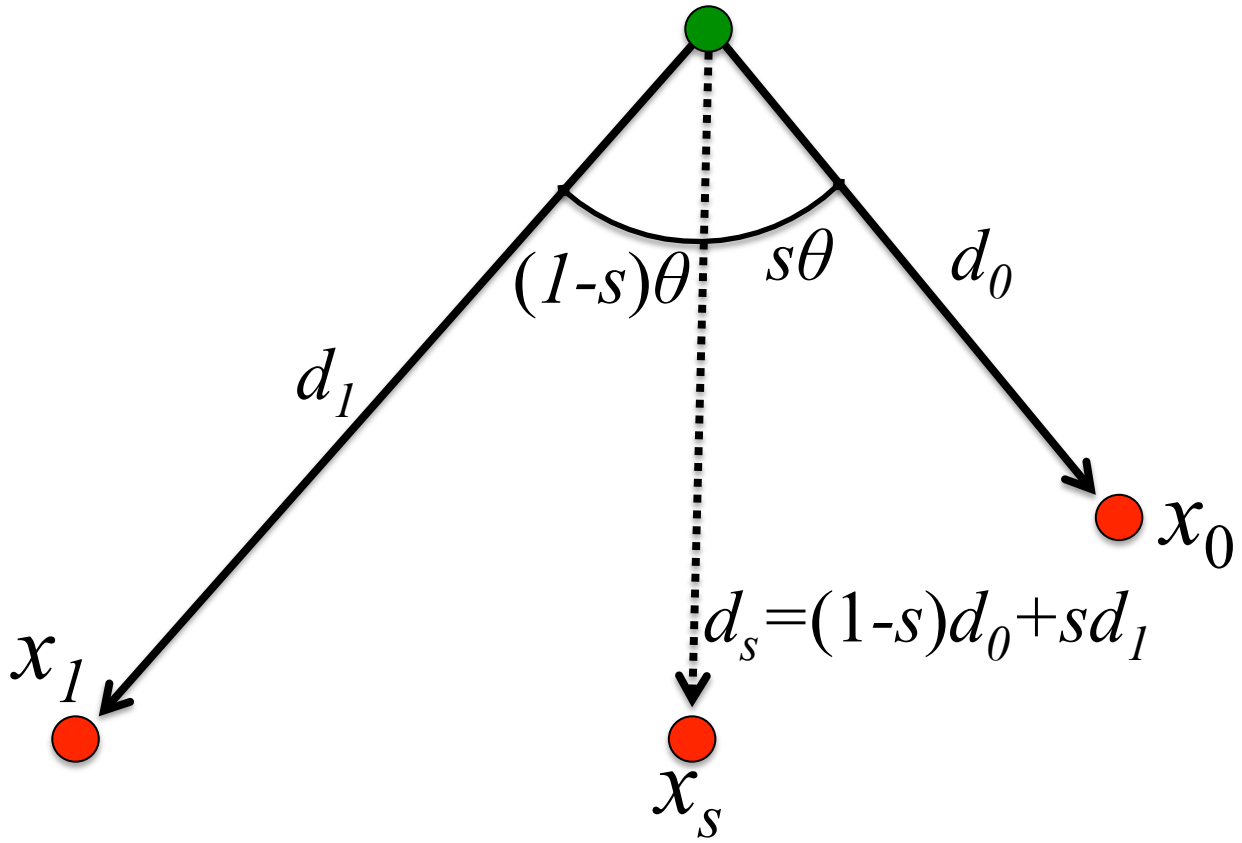

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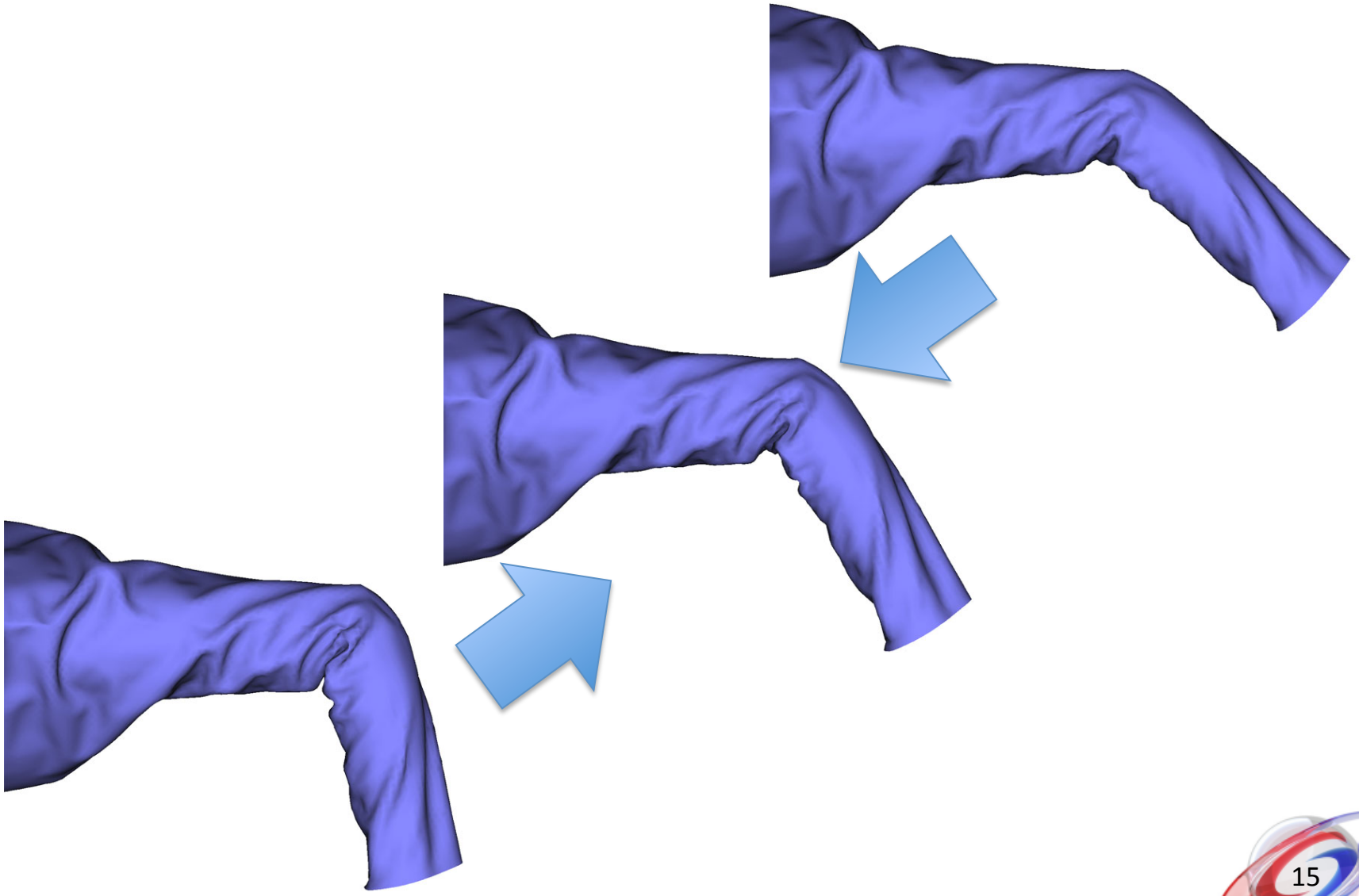
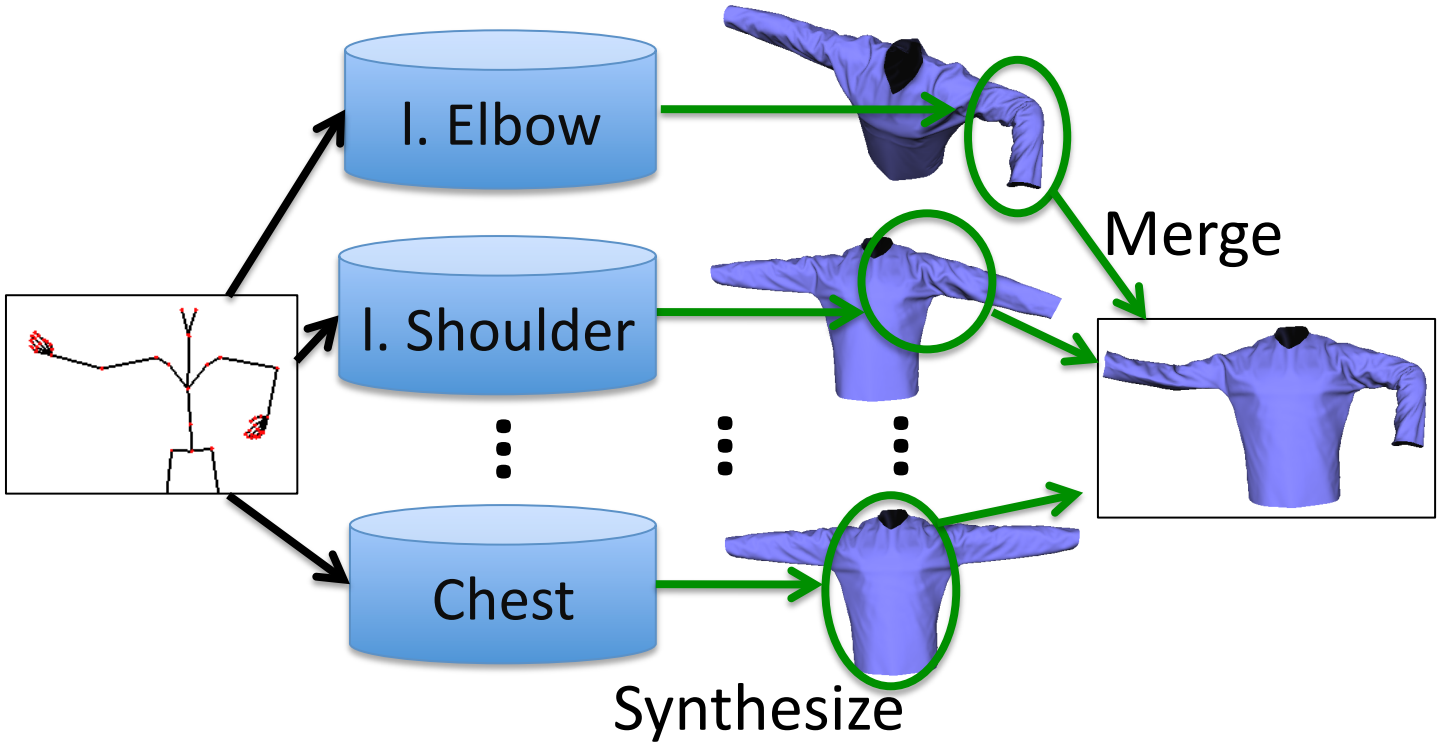
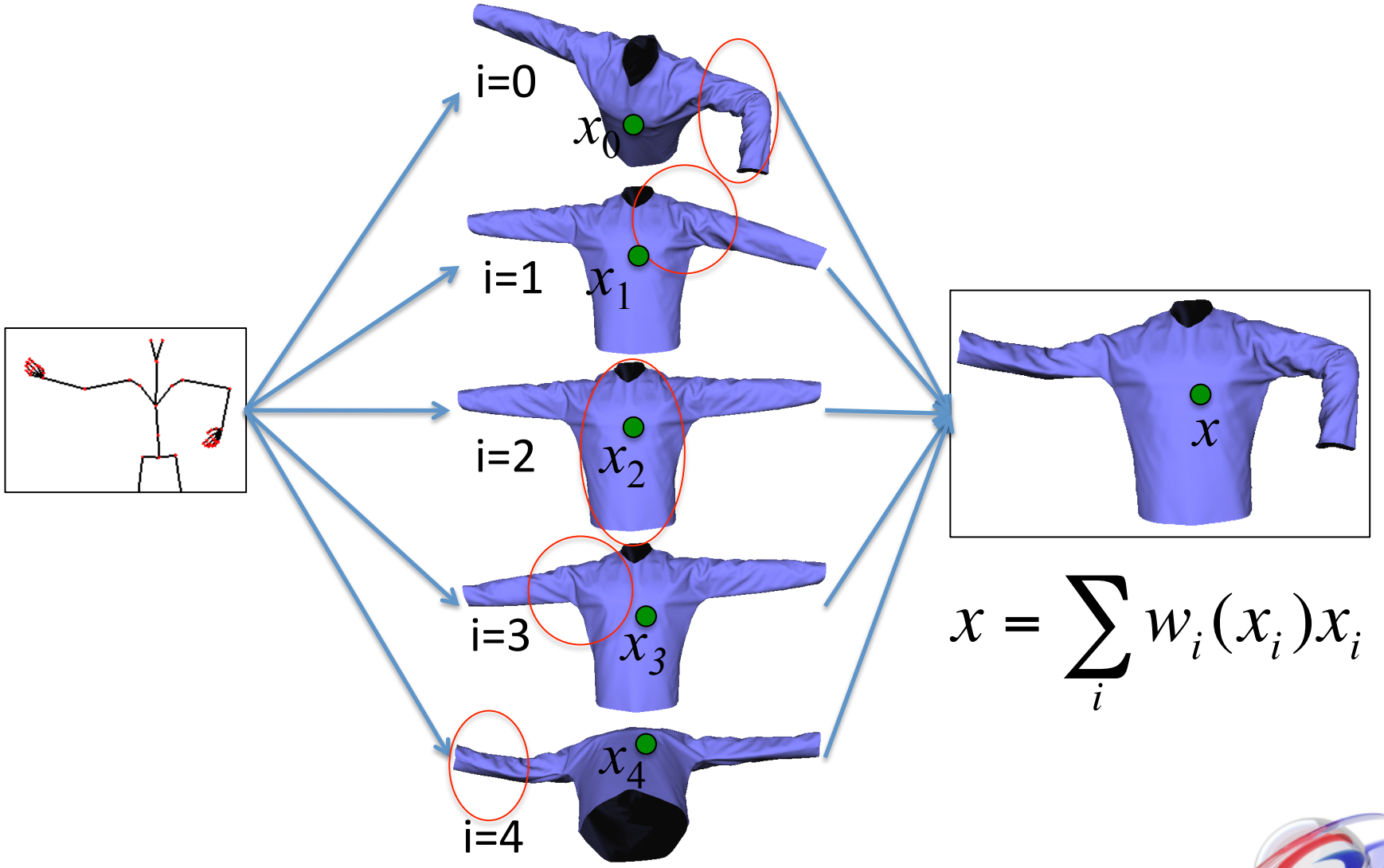


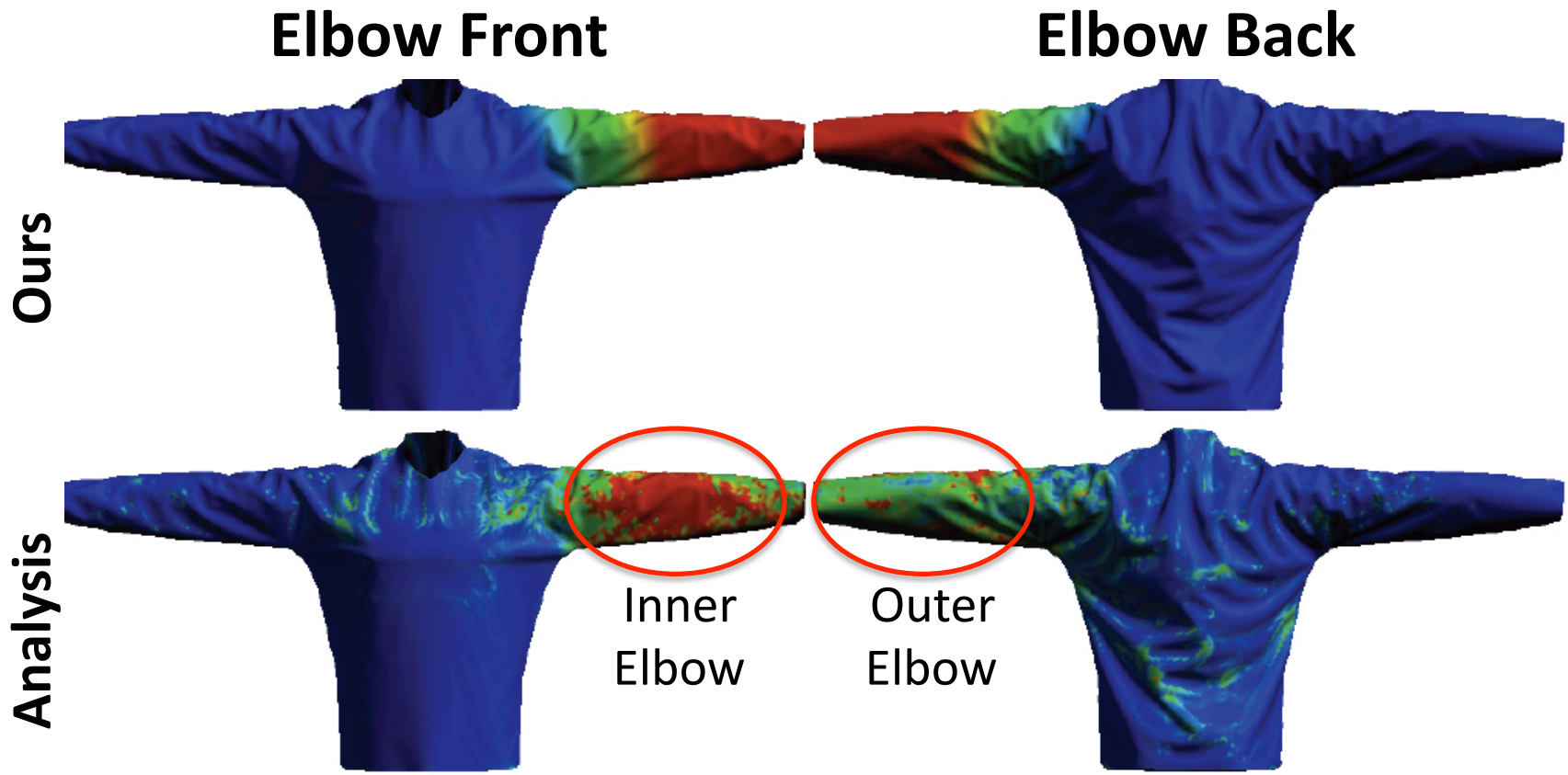
System Pipeline



Inter-Joint Merging



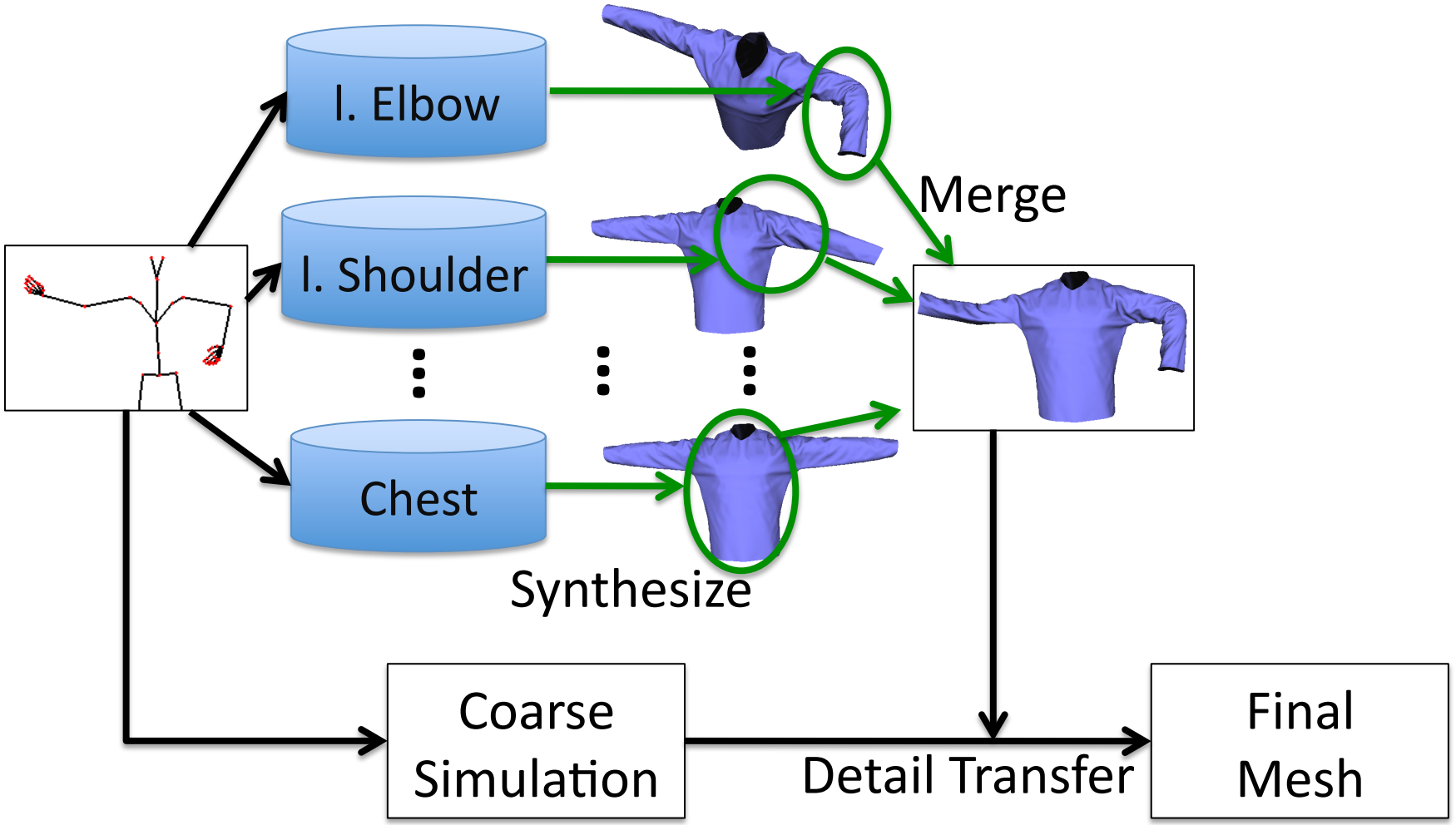
Weight map: Elbow

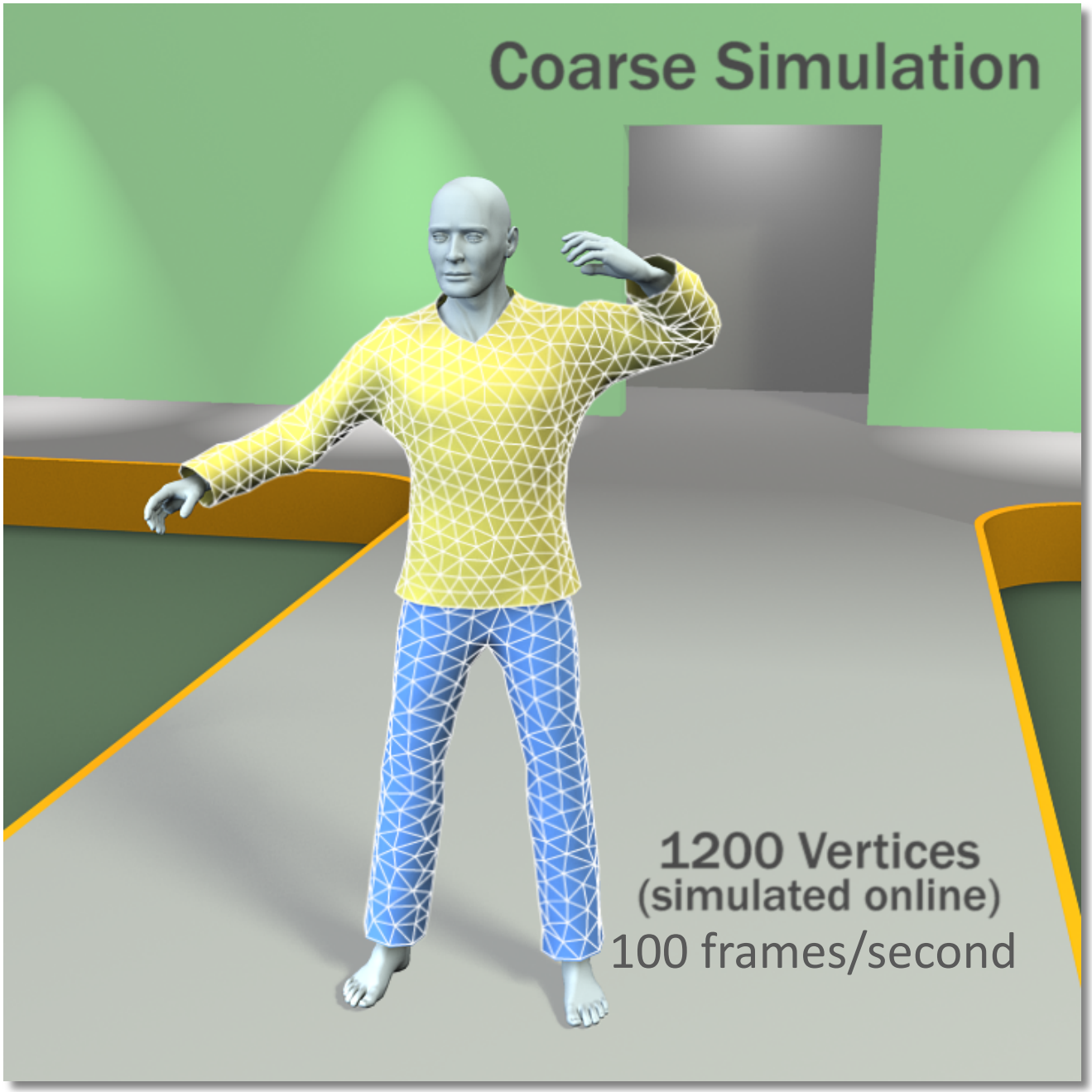


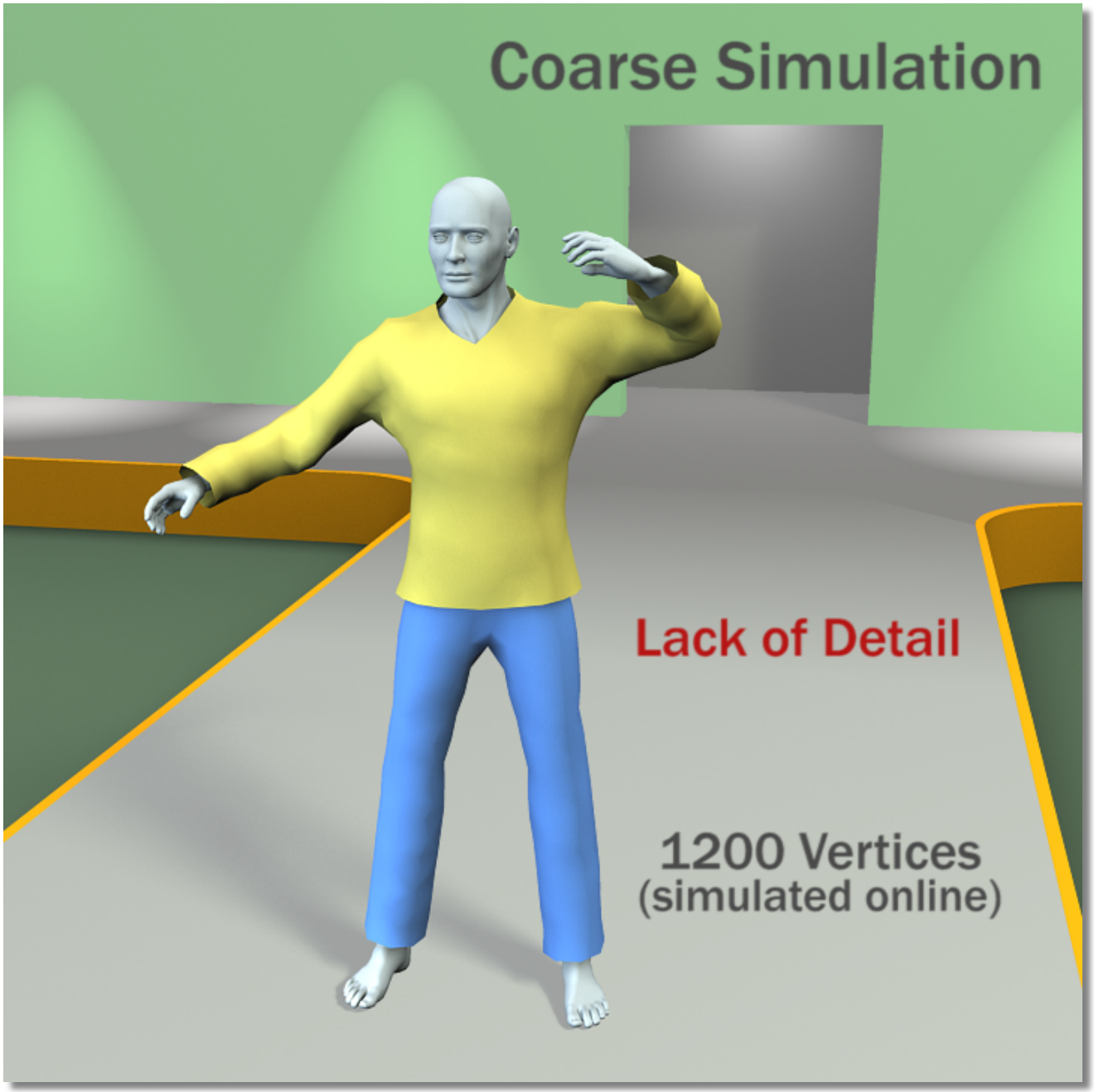
Wrinkle Synthesis Limitations

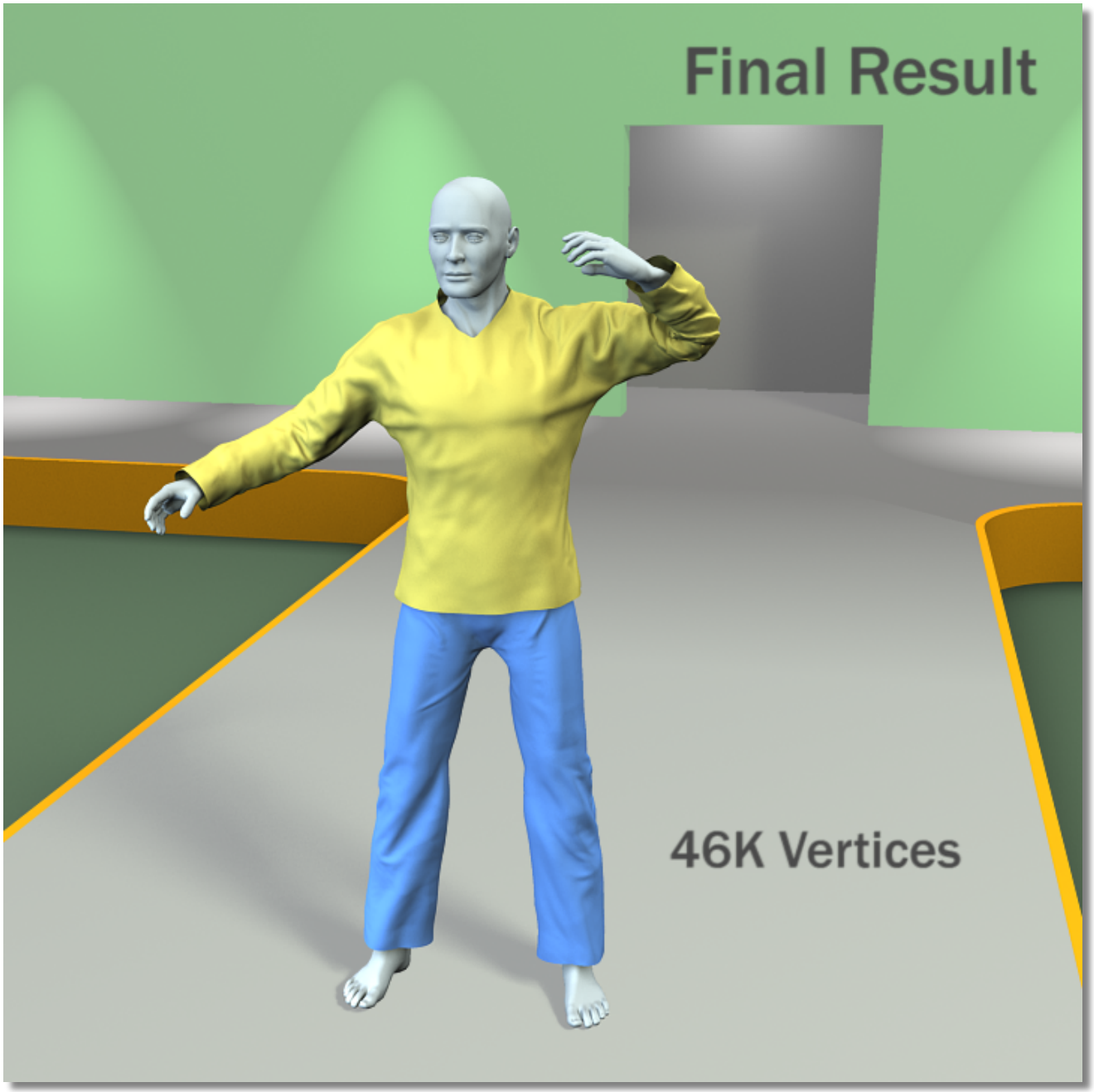
1. No global dynamics 2. Collisions

System Pipeline

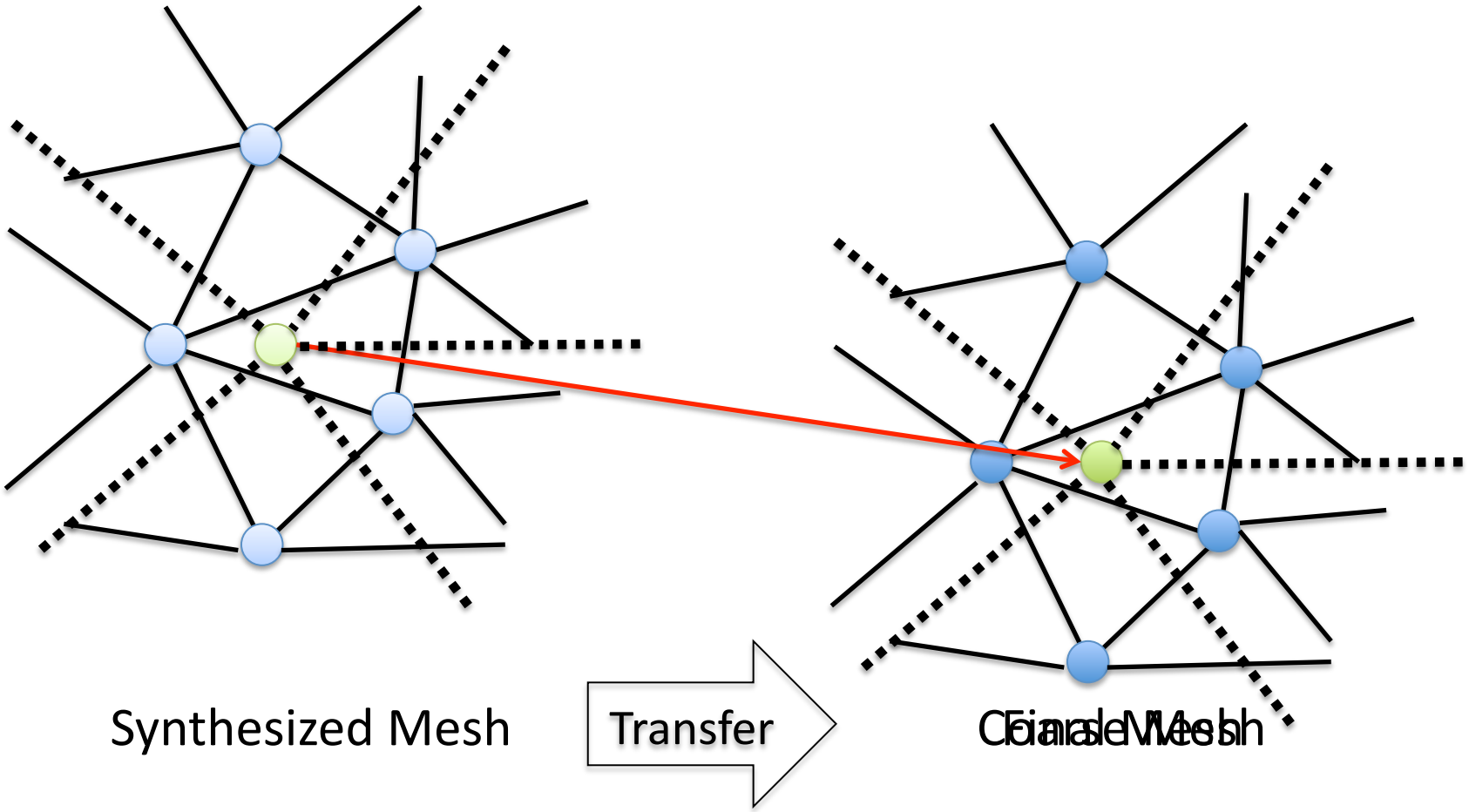



Coarse Simulation
1200 Vertices
(simulated online)
100 frames/second

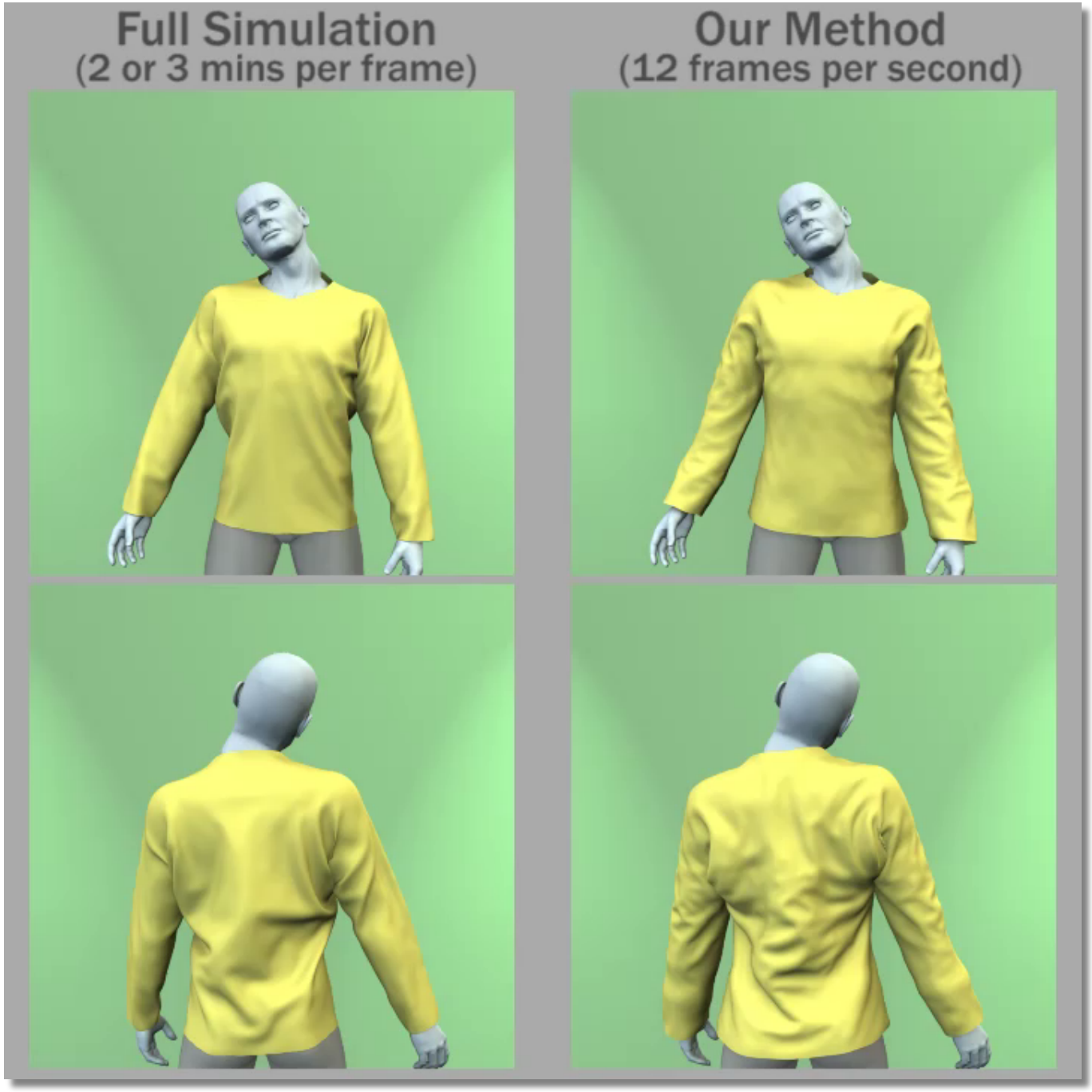

Coarse Simulation
Lack of Detail
1200 Vertices
(simulated online)


Final Result
46K Vertices

Wrinkle Detail Transfer



Side-by-Side


Full Simulation
(2 or 3 mins per frame)
Our Method
(12 frames per second)

Walking and Running
(from the same database)

Summary

- Focused on common clothes, has wide applications
  - Games
  - Fast preview for offline physical simulation
- Combines physics with the database
  - Greatly reduces the computational cost
  - Provides realistic results.
- Reduces a whole pose space to local pose spaces

Acknowledgements

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  - Anonymous reviewers
  - Michael Tao
  - Berkeley Graphics Group

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