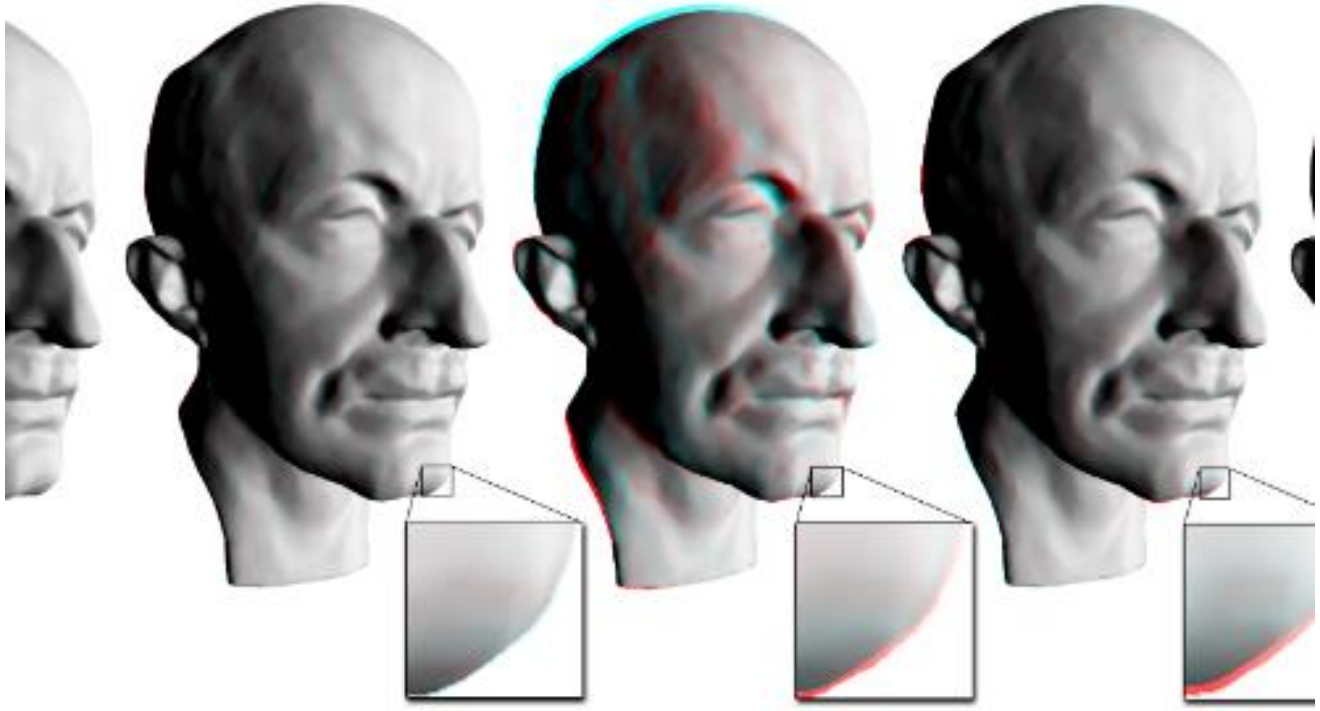
Dynamic meshes

- constant connectivity over time
- PCA over trajectories
- Parallelogram over surface

Váša,L., Skala,V.: CoDDyAC: Connectivity Driven Dynamic Mesh Compression, 3DTV Conference 2007.

Static/dynamic meshes, perception-targetted

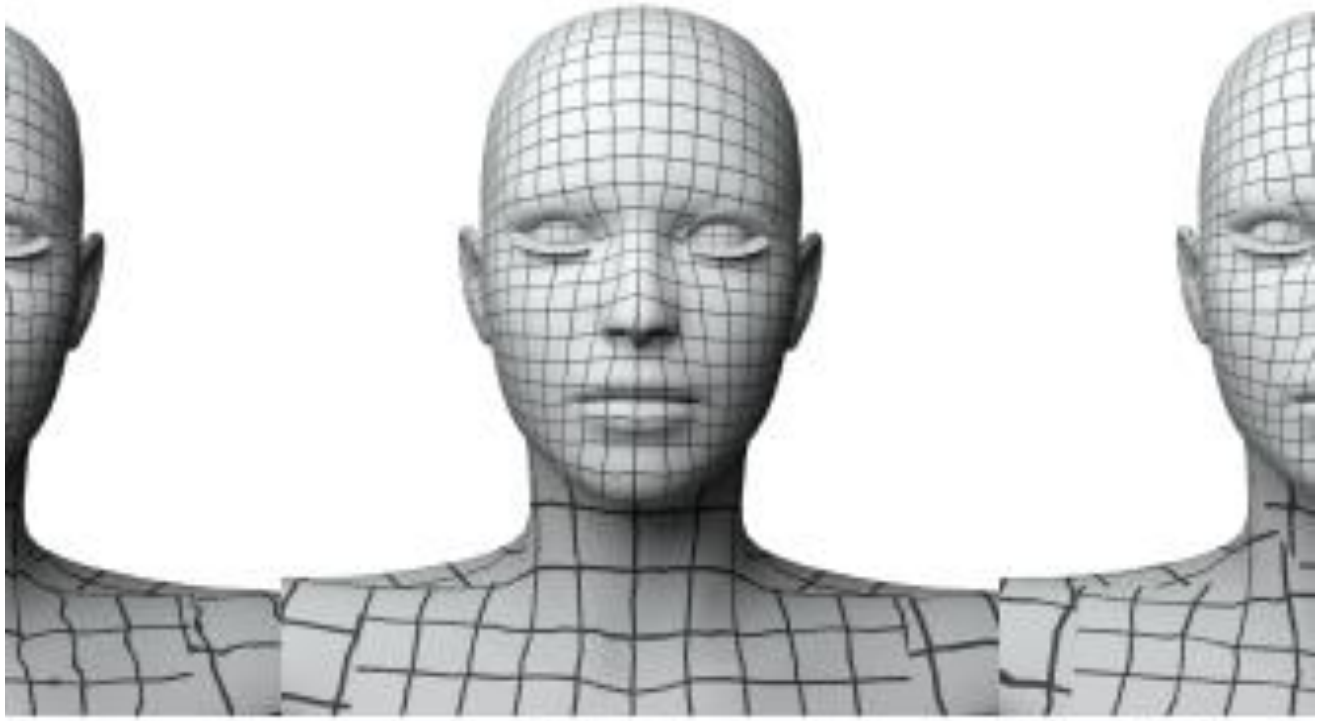


- Laplacian based encoding
- Error propagation control
  - A.k.a smart quantization

Váša,L., Petřík,O.: Optimising Perceived Distortion in Lossy Encoding of Dynamic Meshes, Computer Graphics Forum, Vol. 30(5), pp. 1439-1449, 2011.

Váša,L., Dvořák,J.: Error propagation control in Laplacian mesh compression, Computer Graphics Forum, Vol. 37(5), pp. 61-70, 2018.

Texture coordinates

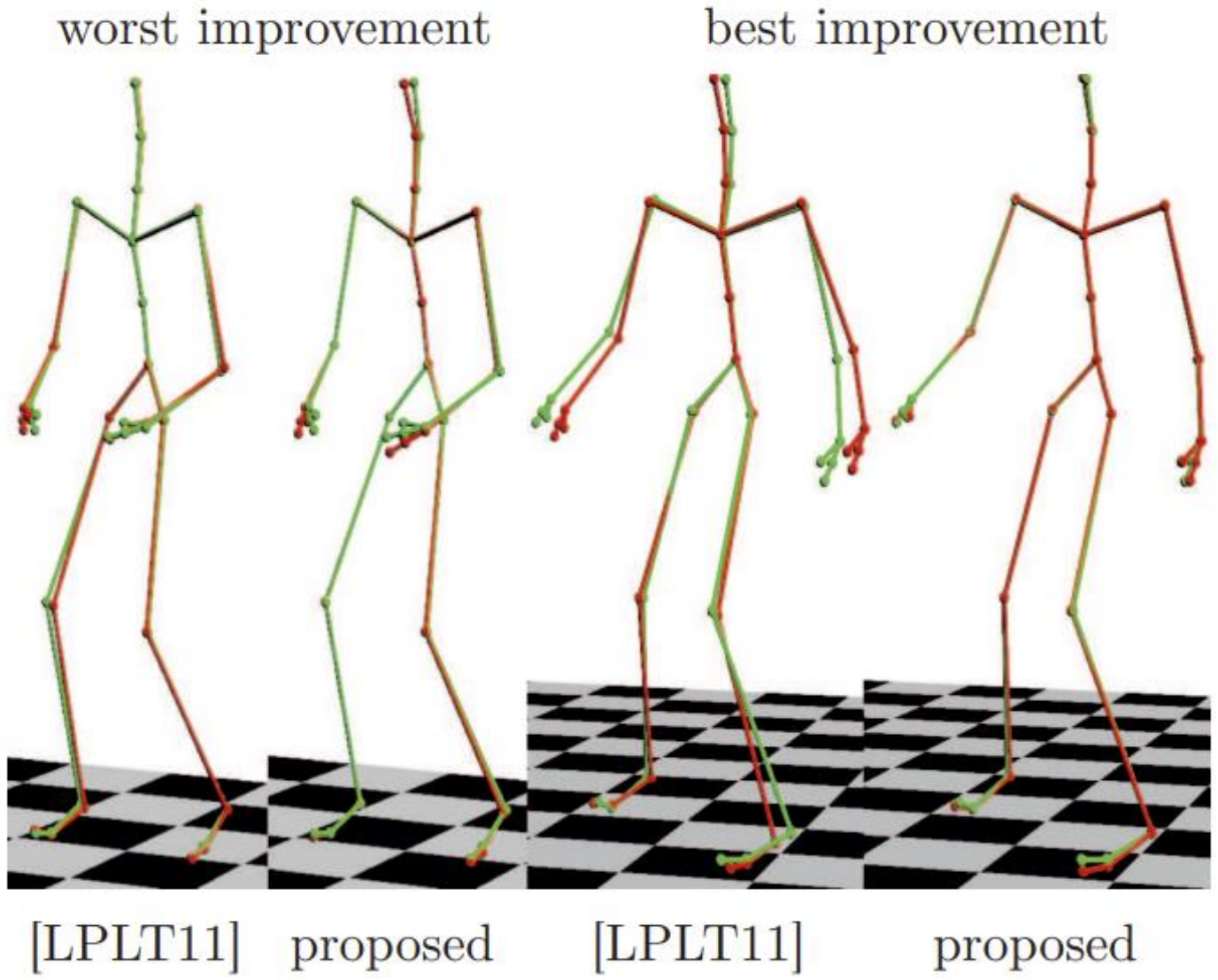


- Based on spatial coordinates
- Laplacian/parallelogram

Váša,L., Brunnett,G.: Efficient encoding of texture coordinates guided by mesh geometry, Computer Graphics Forum, Vol. 33(5), pp 25-34, 2014.

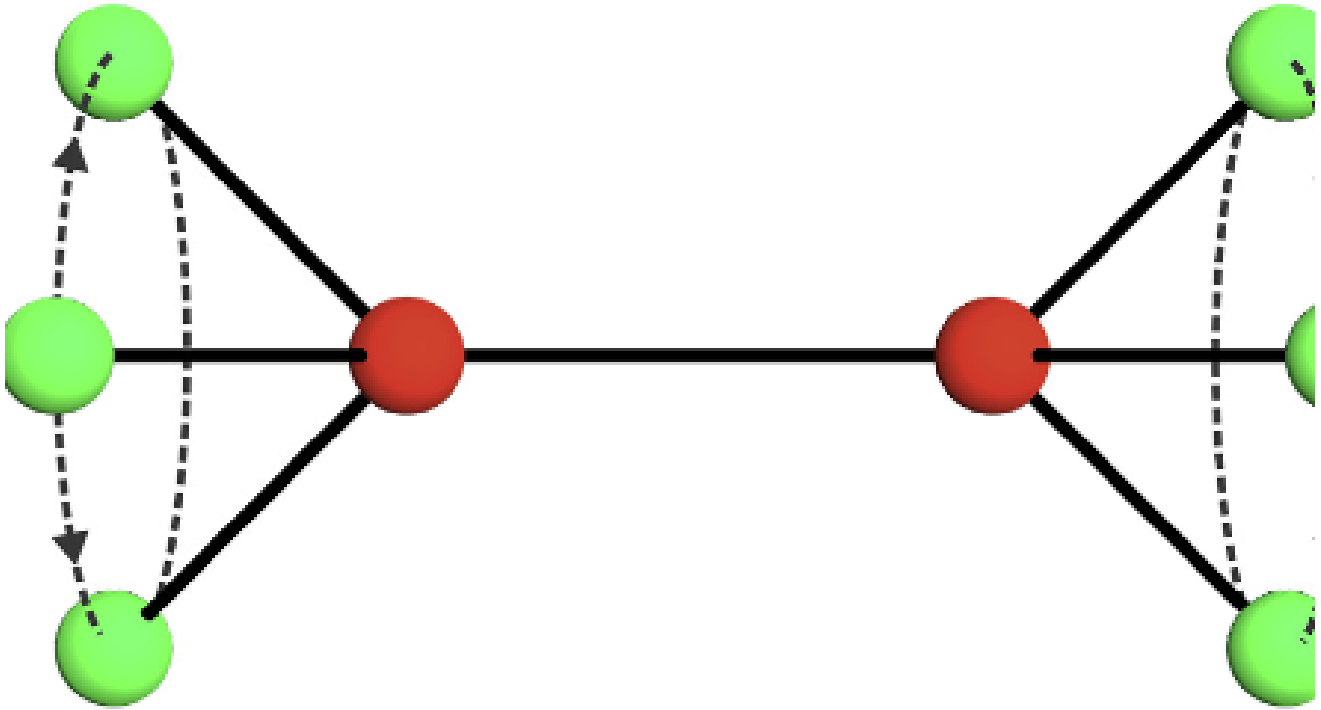
Motion capture data

- Encode angles rather than joint positions
- Respect kinematic chain
  - Error in upper level propagates -> use better precision



Váša,L., Brunnett,G.: Rate-distortion Optimized Compression of Motion Capture Data, Computer Graphics Forum, Vol. 33(2), pp 283-292, 2014.

Molecular dynamics



- „canonical molecule“
- Rotations + corrections wrt canonical molecule
- Temporal coherence

Jan Dvořák, Martin Maňák, Libor Váša, Predictive compression of molecular dynamics trajectories, Journal of Molecular Graphics and Modelling, Volume 96, 2020,

Connectivity for known geometry

- Traversal
- Expand where highest decoder certainty

Dvořák, J., Káčereková, Z., Vančček, P. and Váša, L. (2022), Priority-based encoding of triangle mesh connectivity for a known geometry. Computer Graphics Forum.

Time-varying meshes

- Connectivity changing in time (per frame)
- So far only a model:
  - Centers (volumes) tracked in time
- Proposed pipeline
  - Analyze sequence (track centers)
  - Transmit first frame
  - Predict/encode next frame geometry
    - Use centers
  - Encode next frame connectivity

Dvořák, J., Káčereková,Z., Vaněček,P., Hruda,L., Váša,L.: As-rigid-as-possible volume tracking for time-varying surfaces, Computers and Graphics, to appear.