Today
- Review efficient articulated body deformation from range scan data
- A morphable model for the synthesis of 3D faces, Blanz and Vetter
- Presentation by Alex

Articulated bodies from range scan data
Goal
- Generate articulated body deformations from range scan data
- Fast animation using linear blend skinning and displacement maps

Processing pipeline
1. Data acquisition
2. Skeleton fitting
3. Smooth base skin
4. Displacement maps
5. Hole filling
6. Surface model

Data acquisition
- Laser range scanning
- Wide range of poses
- Surfaces with holes, markers

Skeleton fitting
- Find global skeleton parameters (e.g., bone lengths)
- Determine joint angles for each scan
Smooth base skin
- Subdivision surface
- Deform using linear blend skinning

Displacement maps
- Cast rays along normal of subdivision surface
- Set displacement to signed distance to scanned surface

Hole filling

Surface model
\[ S(u, q) = T(u, q) + d(u, q)\hat{n}(u, q) \]
- \( u \) Surface parameterization
- \( q \) Joint angles
- \( T(u, q) \) Skinned subdivision surface
- \( \hat{n}(u, q) \) Normals of subdivision surface
- \( d(u, q) = \sum w_i(u, q)d_i(u) \)
- \( d_i(u) \) Displacement map for i-th pose

Results