

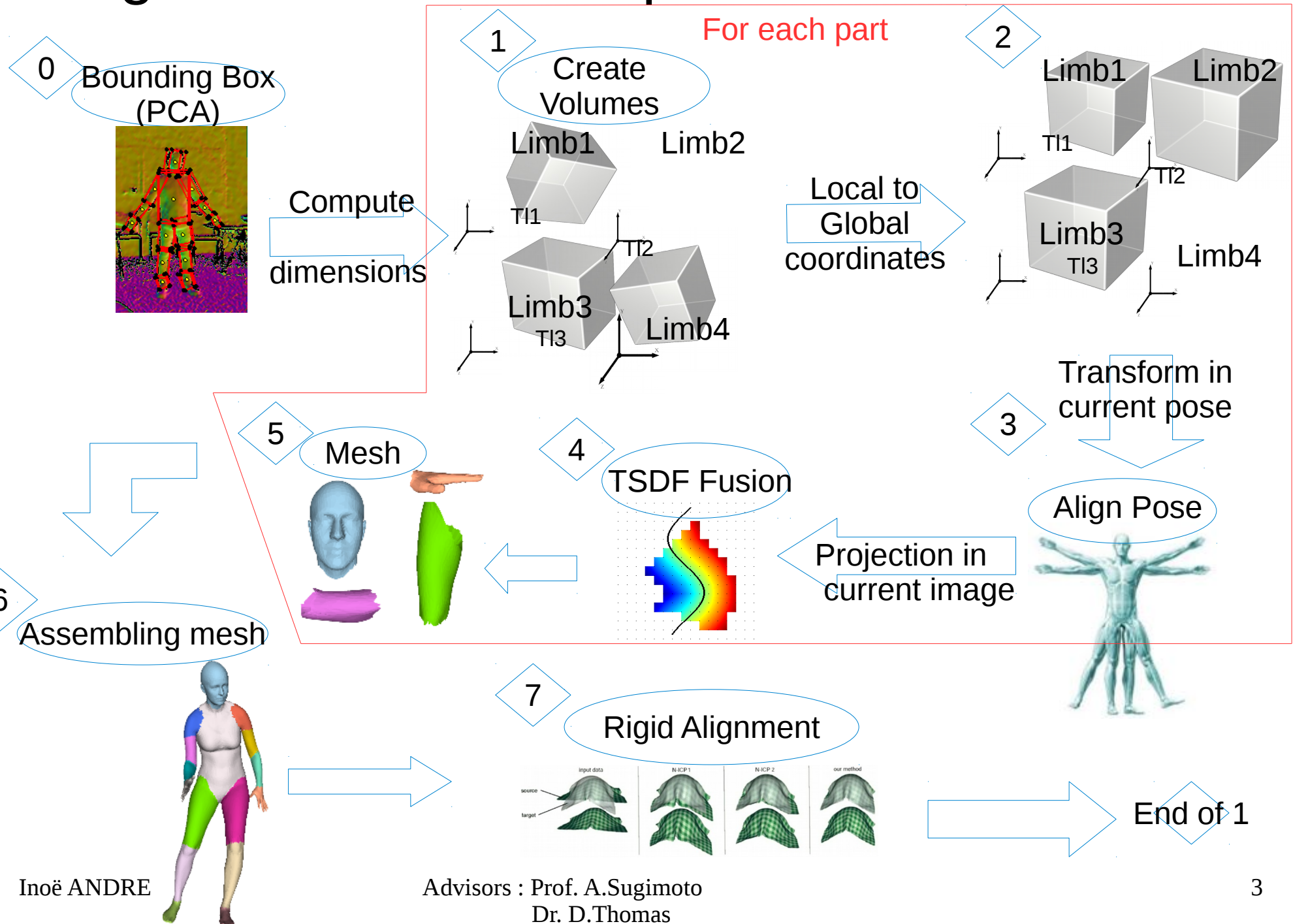
Dynamic fusion

Internship Week 19
Segmented Fusion
29th June 2017

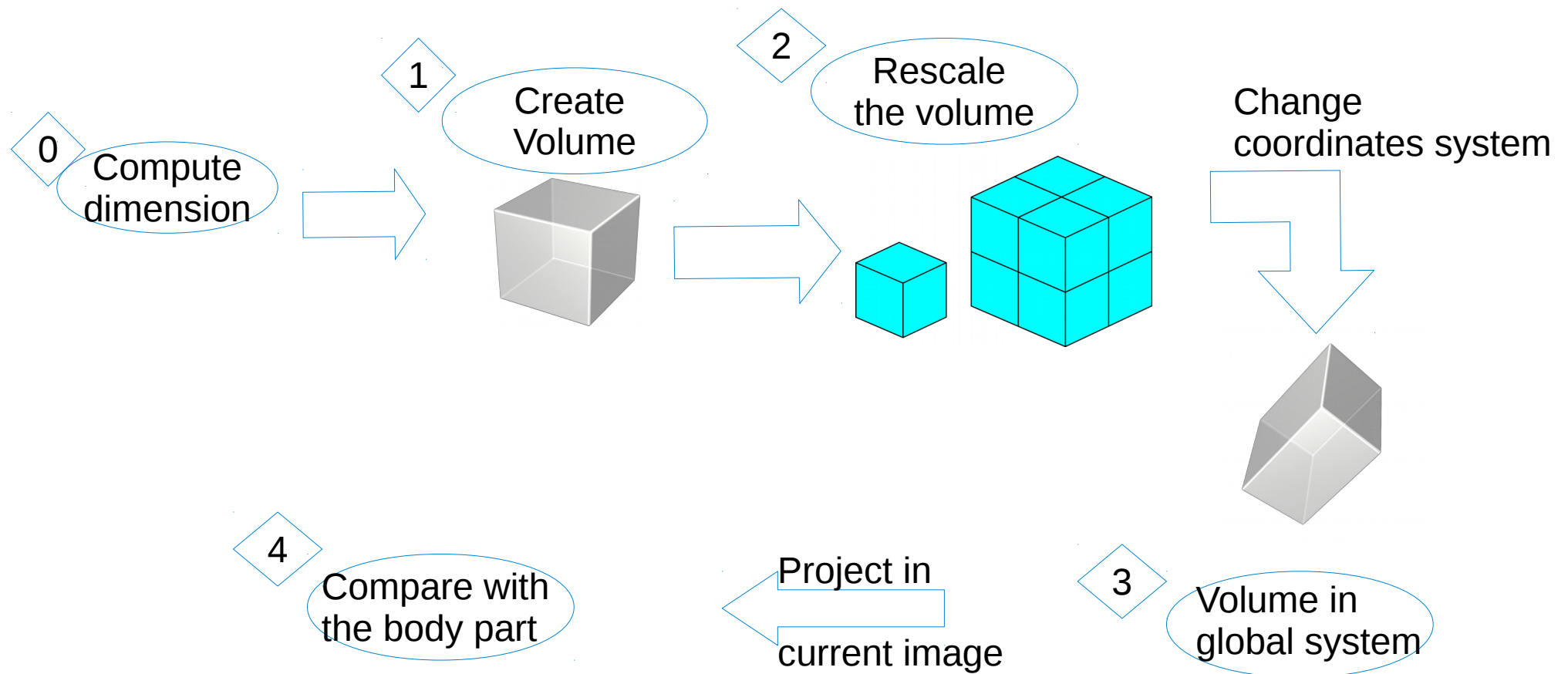
Last meeting

- Previously
 - Mesh tracking working
 - Local to global transformation
 - Length of each volume
- Plan for today's meeting:
 - Read papers
 - Local to Global transform
 - Volume transform and projection
 - Fusions, Meshes, Assembling Meshes...

Segmented Fusion Pipeline

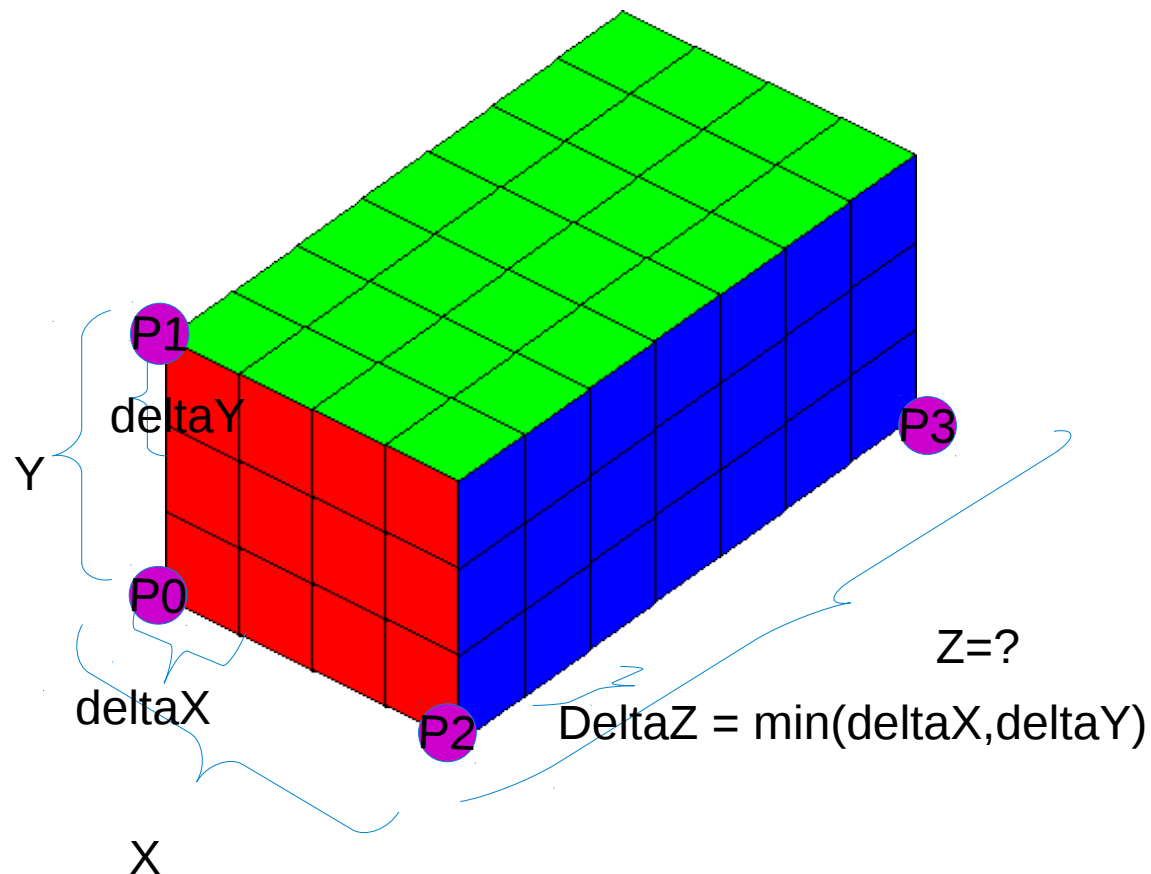


Transform Volume:



Volume length depth:

Compute the length of X and Y through 2D projection:



$$\begin{aligned}\Delta X &= (P2 - P0)/X, \text{axis } 0 \\ \Delta Y &= (P1 - P0)/Y, \text{axis } 1 \\ \Delta Z &= \min(\Delta X, \Delta Y)\end{aligned}$$

$$Z = (P3 - P2)/\Delta Z, \text{axis } 2$$

Overlay bounding Boxes and point of clouds

Fitting the clouds of points in bounding boxes

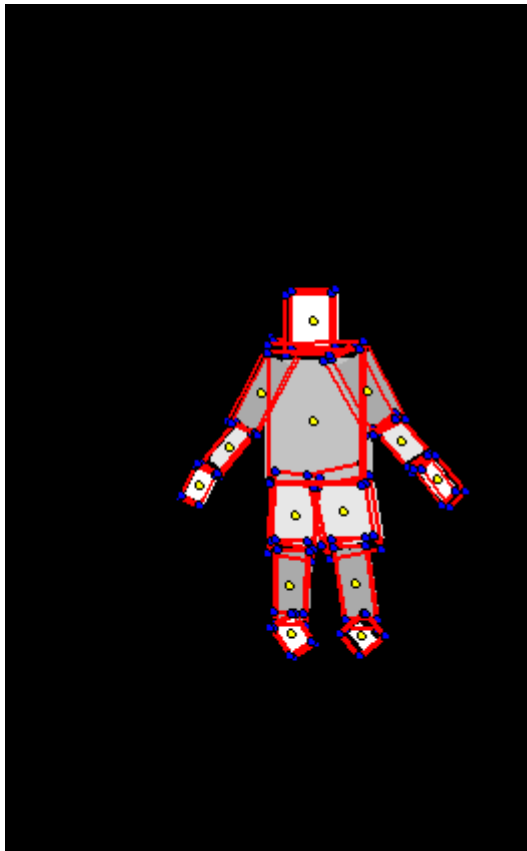


Image 200

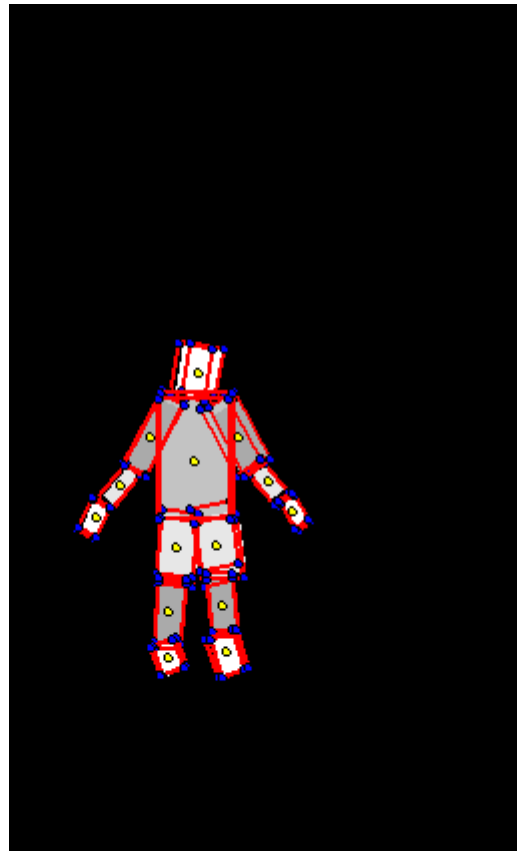


Image 20

Algo :

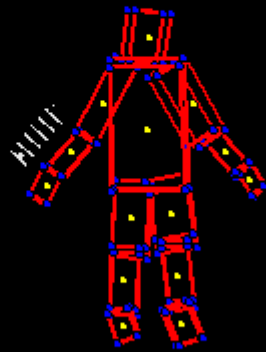
- 1) Compute dimension and scaling :
(1/DeltaX, or Y or Z)
- 2) Get transfo local to global using eigen vector + center of cloud of points in Global coordinates
- 3) Rescale, transform and project the cloud of point.

Transfo : e2 e1 e3 Mean
[[0.54 0.79 -0.26 1.03]
[0.79 -0.58 -0.12 0.39]
[0.26 0.16 0.94 3.76]
[0. 0. 0. 1.]]

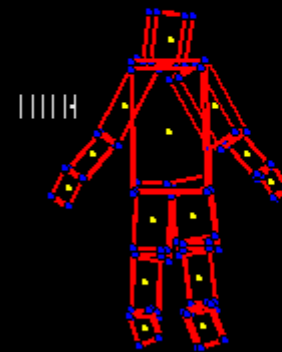
However no zero crossing in TSDF

Volume: Transform in TSDF

Fitting lower arm with local to global transformation and hard value scaling



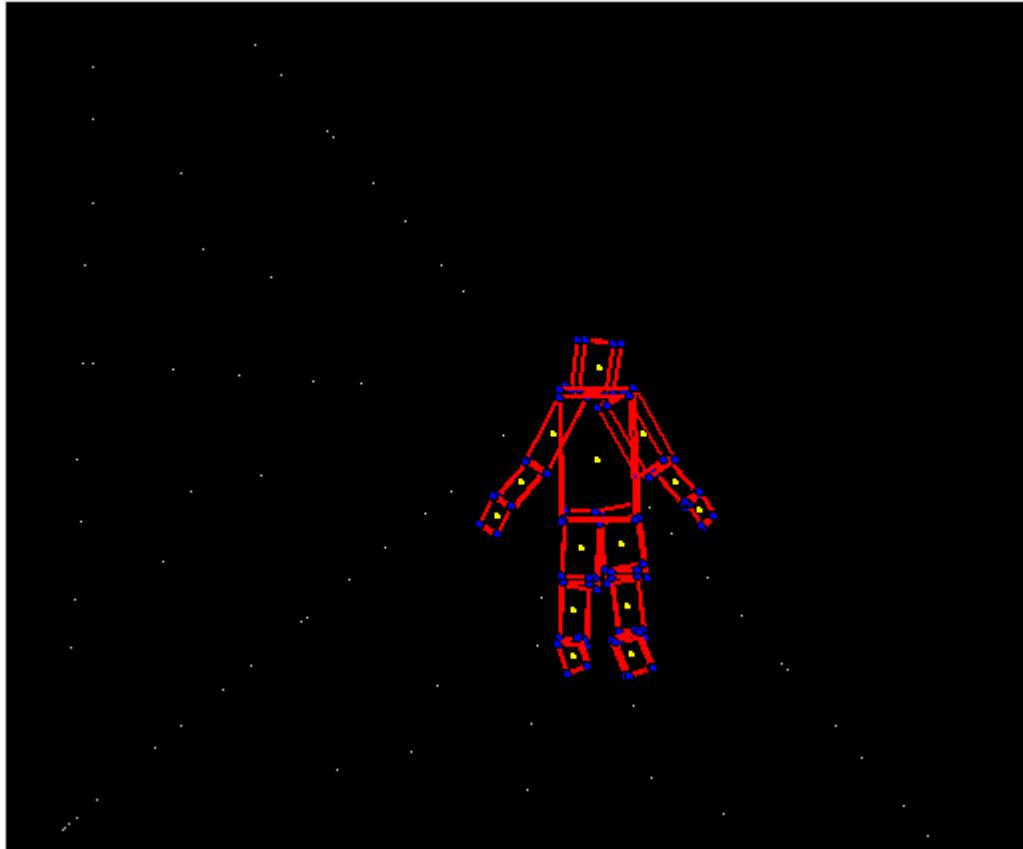
Fitting lower arm with Identity 4 transformation and hard value scaling



Transfo : (e1,e2,e3,mean)

TSDF:

Parameters compute with epsilons



Hard value parameters + centers cannot move



Action plan

- Reading papers : conceive algo
- Fusion for each segmented body part separately:
 - Local transform
 - Coordinates change one by one
 - Fuse one by one
 - Align globally