NII International Internship program
Segmented Fusion

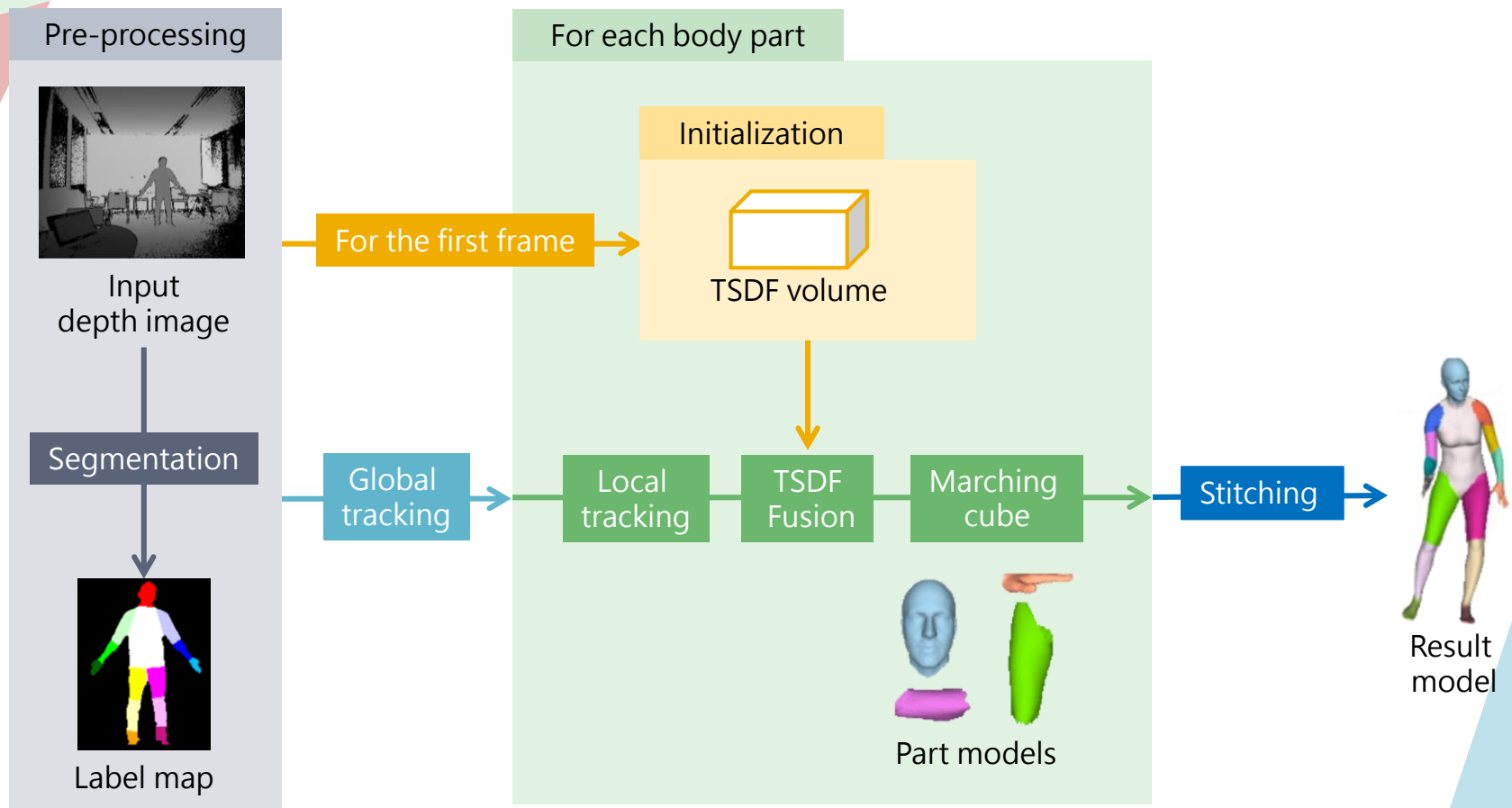Dataset
20170929
Sylvia
Advisors: Prof. A.Sugimoto
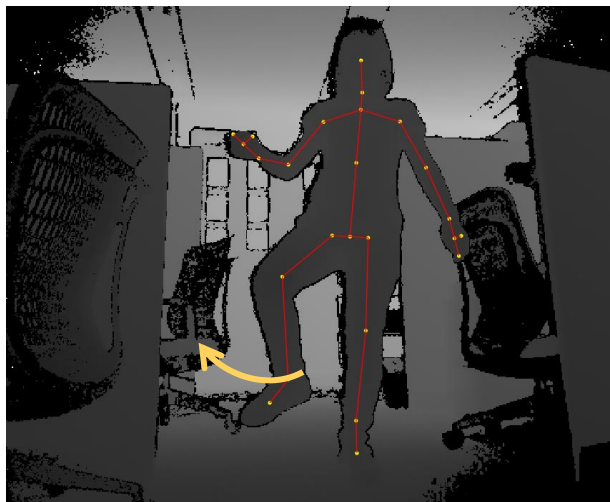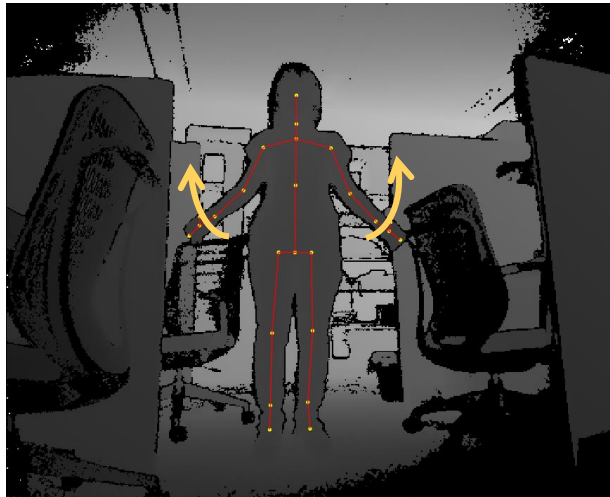   Ass.Prof. D.Thomas

Last Meeting

- ♣ Previously
  - ♣ Discuss codes
- ♣ To-do
  - ♣ Pipeline
  - ♣ Create dataset
  - ♣ Modify codes
  - ♣ Run dataset and find problems or inspirations
  - ♣ Fusion4D

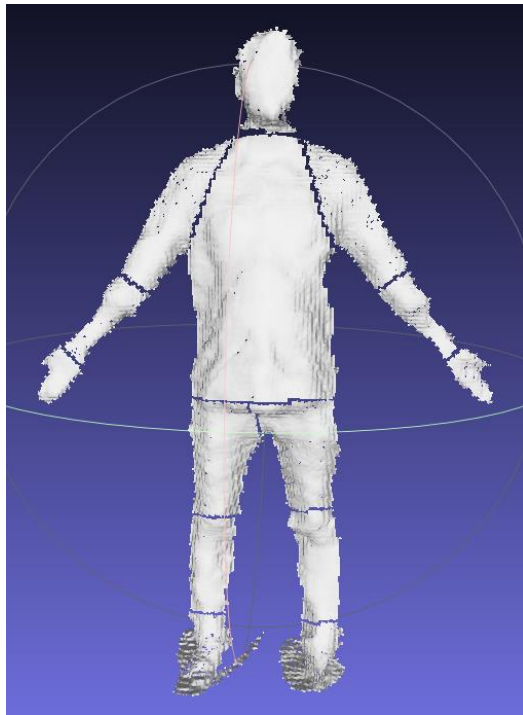Presenter: Sylvia
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Pipeline

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Dataset

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Codes

- ♣ Before: 213.81s/10frames
- ♣ After: 167.39s/10frames

First frame mesh

Result mesh

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Tracking

♣ Improve the results by aborting the global tracking
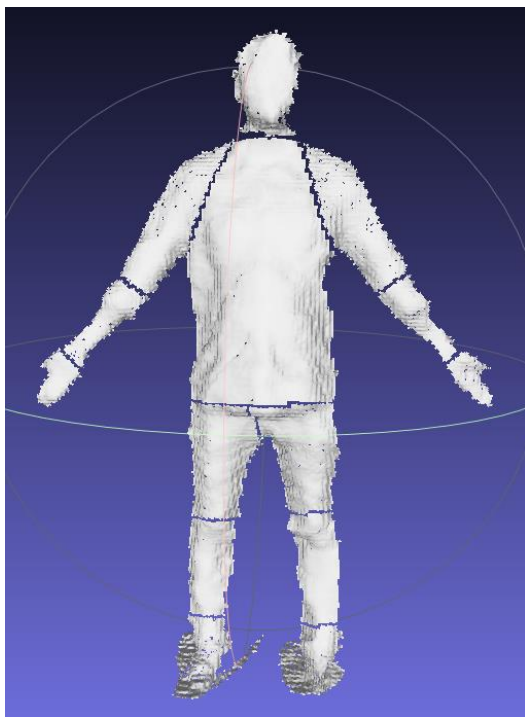
First frame mesh   Before   After

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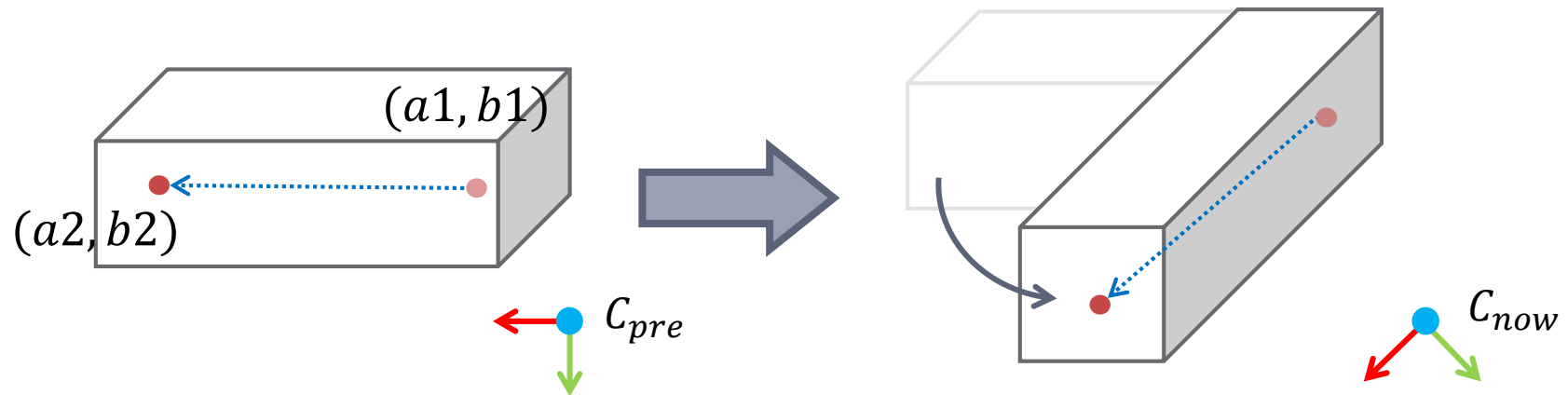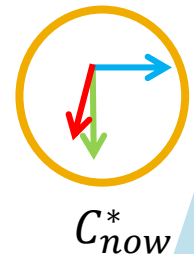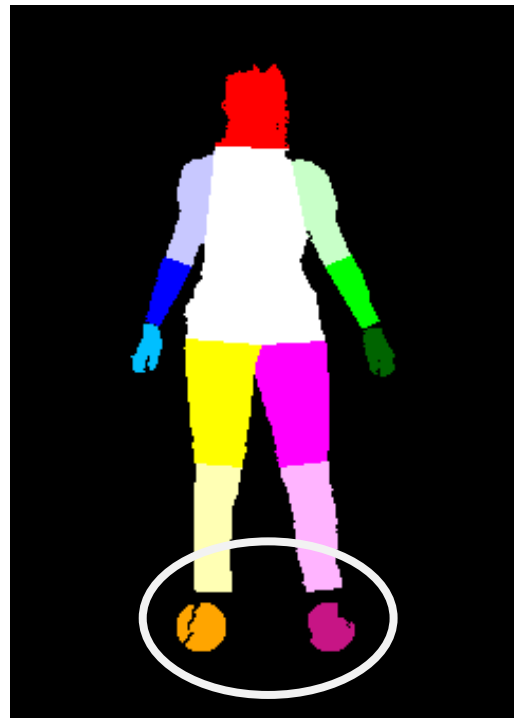
Tracking

$$x_{axis} = \frac{(a2-a1, b2-b1, d)}{\|(a2-a1, b2-b1, d)\|}$$

♣ $z_{axis} = (0,0,1)$

♣ $y_{axis} = x_{axis} \times z_{axis}$

♣ $T_{local} = C_{now} \, C_{pre}^{-1}$

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New dataset

♣ The segmentation is not robust

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4DFusion

♣ The real-time multi-view non-rigid reconstruction system for live performance capture

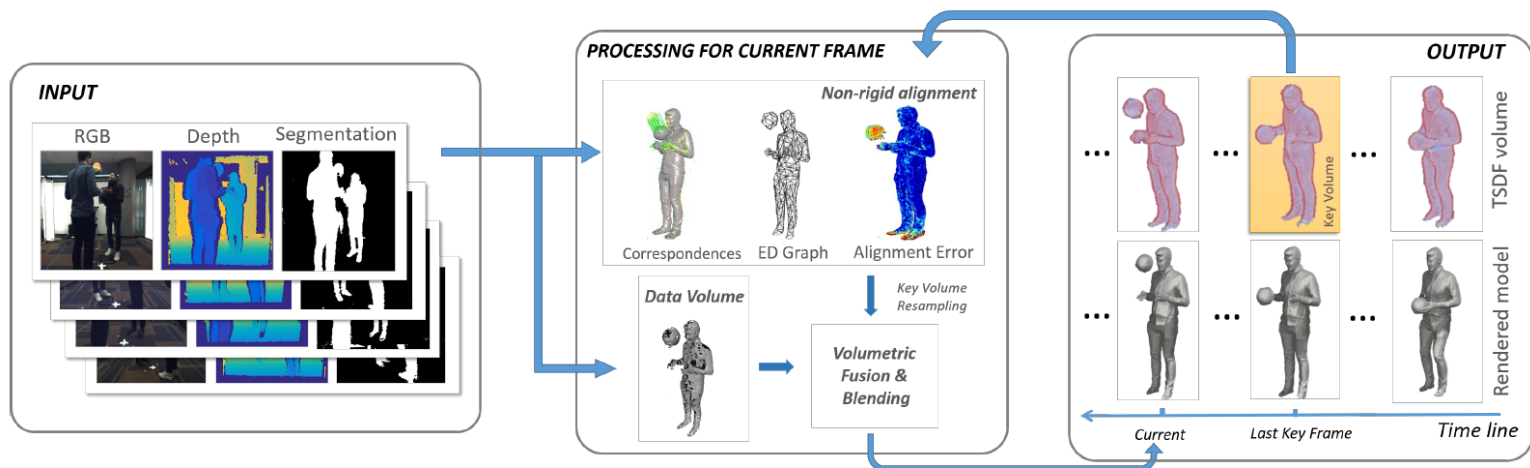♣ The system is robust to large frame-to-frame motion and topology changes.

Figure 2: *The Fusion4D pipeline. Please see text in Sec. 3 for details.*

Dou, Mingsong, et al. "Fusion4d: Real-time performance capture of challenging scenes." *ACM Transactions on Graphics 中 (TOG)* 35.4 (2016): 114.

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4DFusion

♣ This paper uses 'ED nodes' with local deformation and global transformation to warp the reference volume.

♣ $E(G) = \lambda_{data}E_{data}(G) + \lambda_{hull}E_{hull}(G) + \lambda_{corr}E_{corr}(G) + \lambda_{rot}E_{rot}(G) + \lambda_{smooth}E_{smooth}(G)$
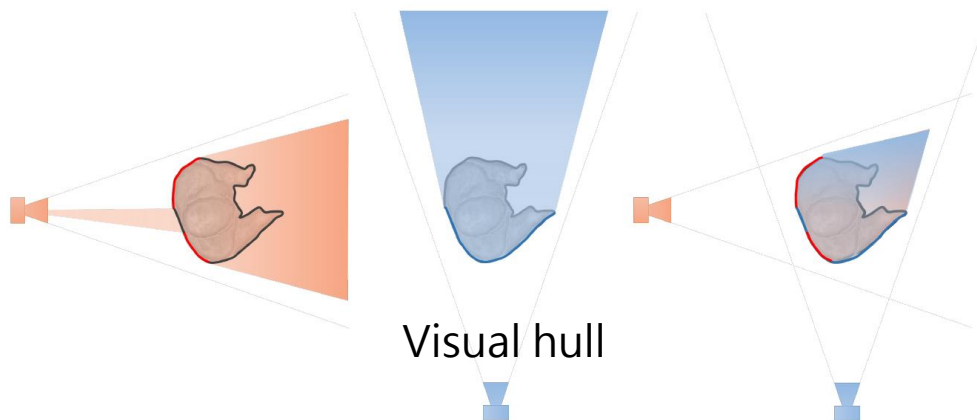
Visual hull

Dou, Mingsong, et al. "Fusion4d: Real-time performance capture of challenging scenes." *ACM Transactions on Graphics 牛 (TOG)* 35.4 (2016): 114.

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4DFusion

♣ This paper uses two volumes, data volume and reference volume, to handle tracking failure and topology changes.

♣ After fusing the data volume from the current frame into the reference volume, the system fuses the reference volume back into the data volume.

Dou, Mingsong, et al. "Fusion4d: Real-time performance capture of challenging scenes." *ACM Transactions on Graphics 上 (TOG)* 35.4 (2016): 114.

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Next step

♣ Modify the tracking part
♣ Improve the segmentation

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