

Dynamic fusion

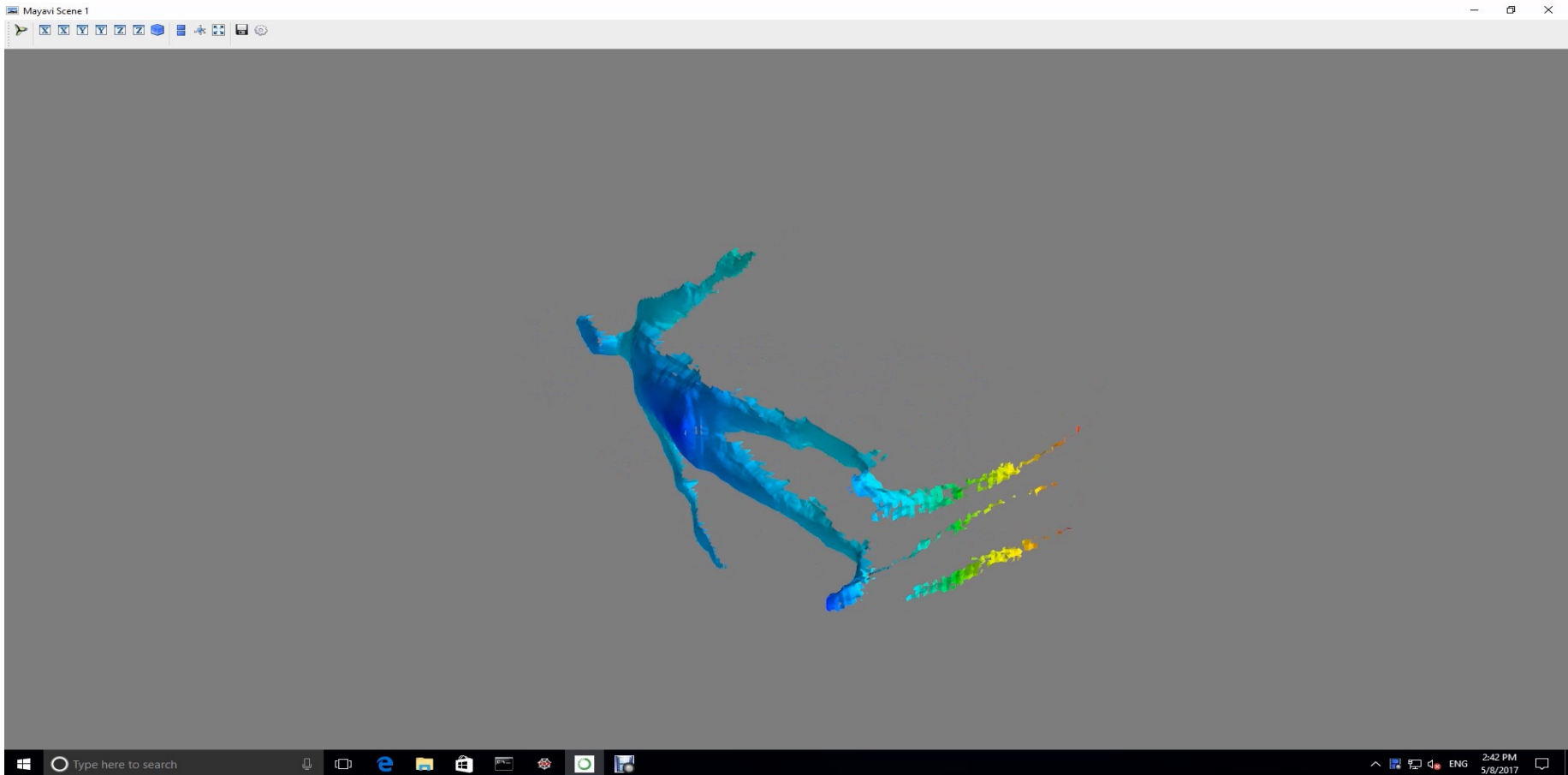
Internship Week 11-12
Fusion
12 May 2017

Last meeting

- Previously
 - Marching Cubes OK
 - Generate depth image with wrong input
 - Fusion : disappearing mesh
 - Segmentation Fusion : Need to project correctly
- Plan for today's meeting:
 - Depth image from marching cubes
 - Overlay depth images
 - Fusion
 - Fusion for each part

Progress

- Marching Cubes :
 - Python's marching cube gave close Meshes => Diego recoded it



Progress

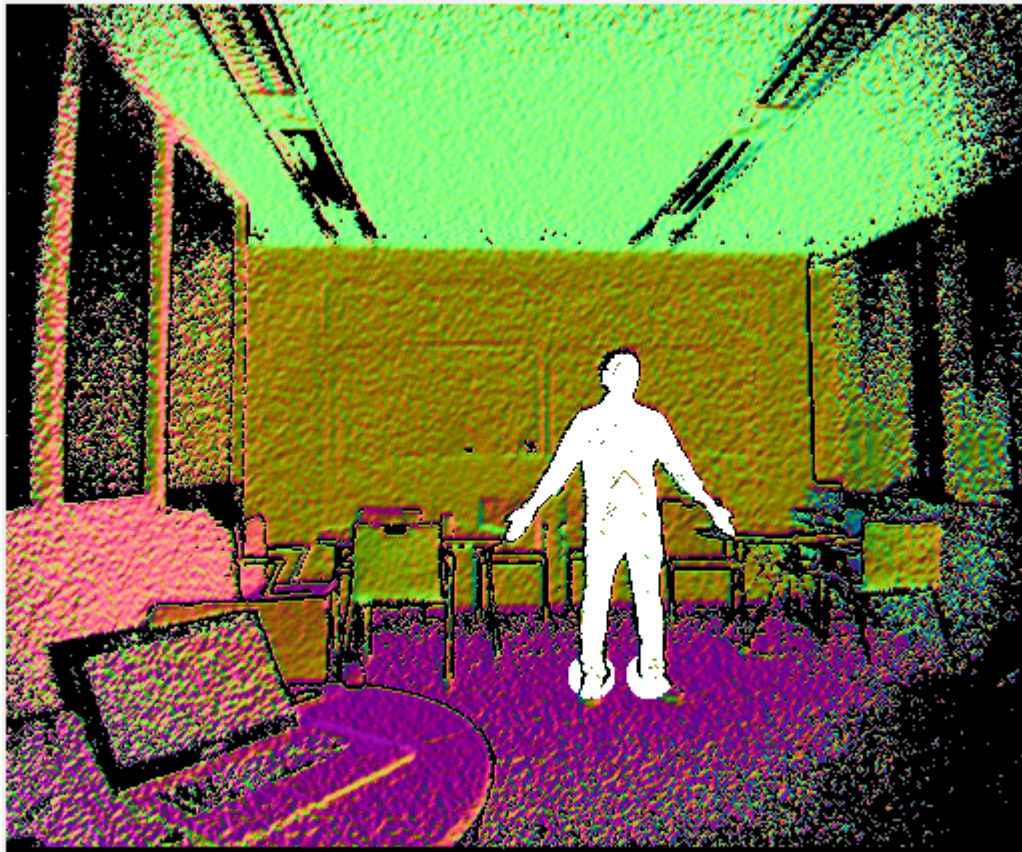
- Depth Image generated through Marching Cubes Vertices:
 - Projection of vertexes (given by marching cubes) to the camera view (intrinsic parameters)
 - Project in 2D space : x/z and y/z and transform with intrinsic parameters to create the depth image (input = result of the previous step)
 - Compute Vertexes
 - Compute Normal
 - Draw in 2D.

Progress

- 2D image through marching cubes output:
 - Projection with camera intrinsic parameters
 - Use vertexes and normals of marching cubes output to Draw in 2D.

Progress

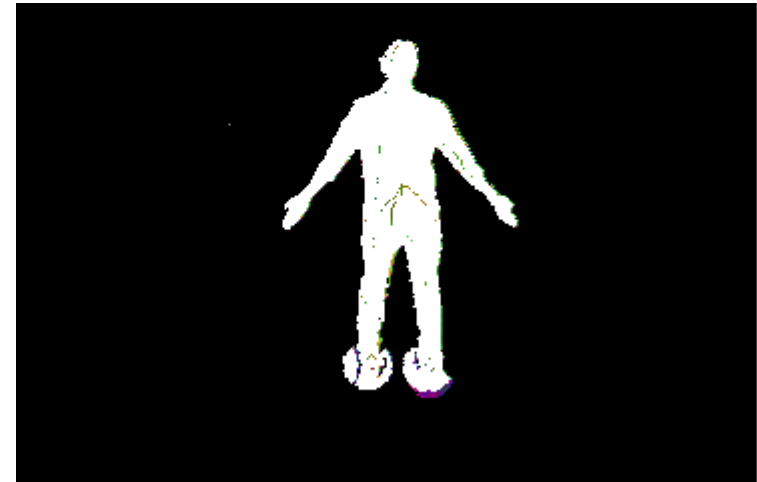
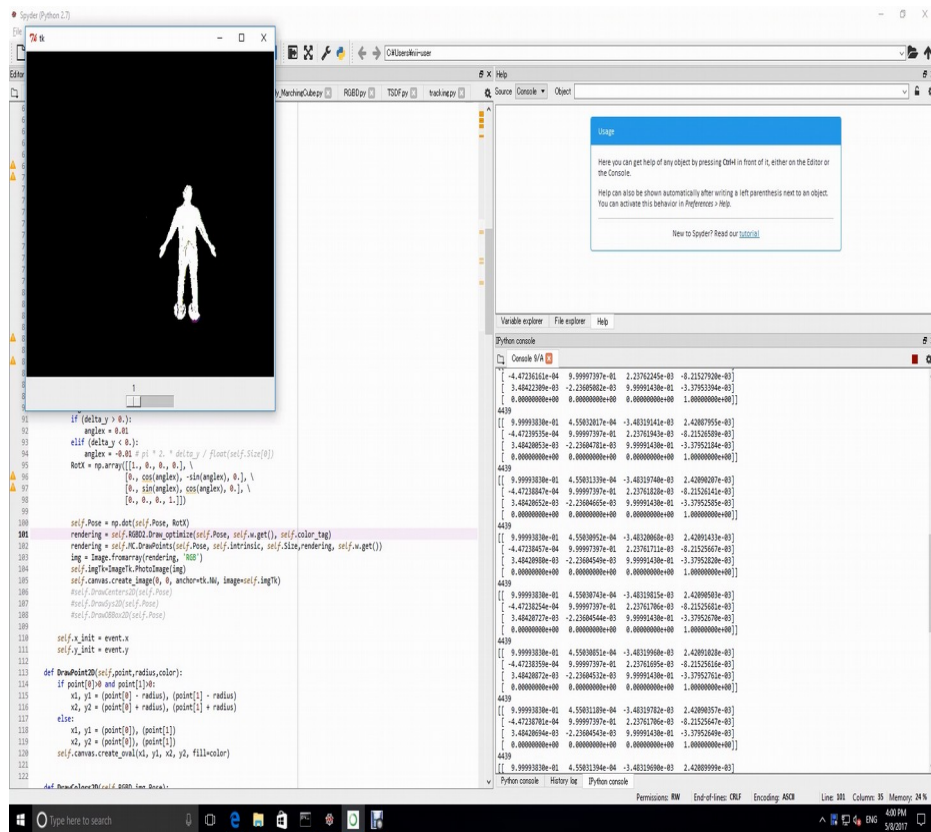
- Overlay



Take the rendering of depth image generated through MC's vertices and on top of this rendering, create the rendering directly using vertices of MC.

Progress

- Tracking:



Algo:

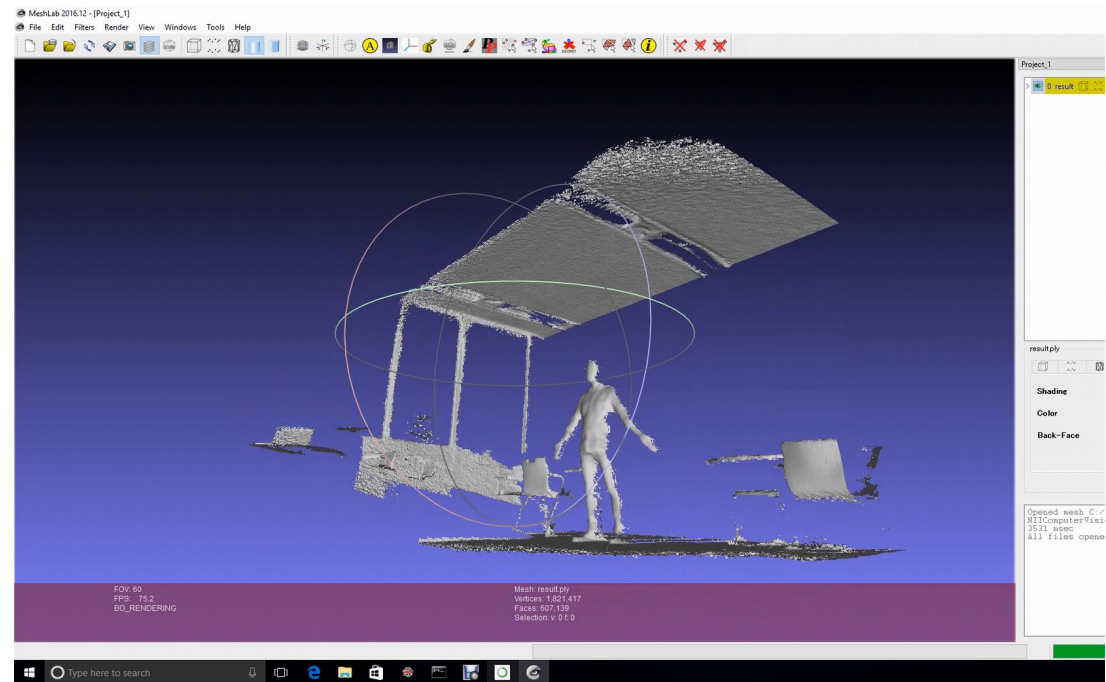
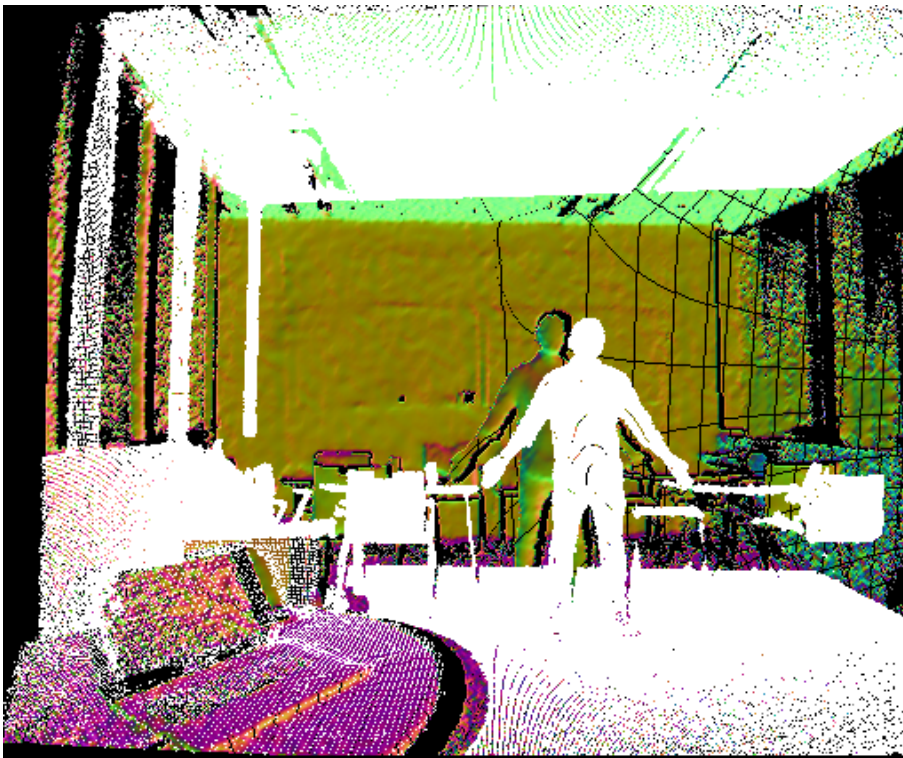
- 1)Former Raw image : depth conversion + segmentation
- 2)New Raw image : depth conversion + segmentation
- 3)Tracking on new and old images in the 3D space
- 4)Projection of both images in 2D space applying new pose on the new image

Progress

- Fusion
 - Add Global Weight and TSDF update
 - Lack of GPU memory => TSDF type :
convert float to short int

Progress

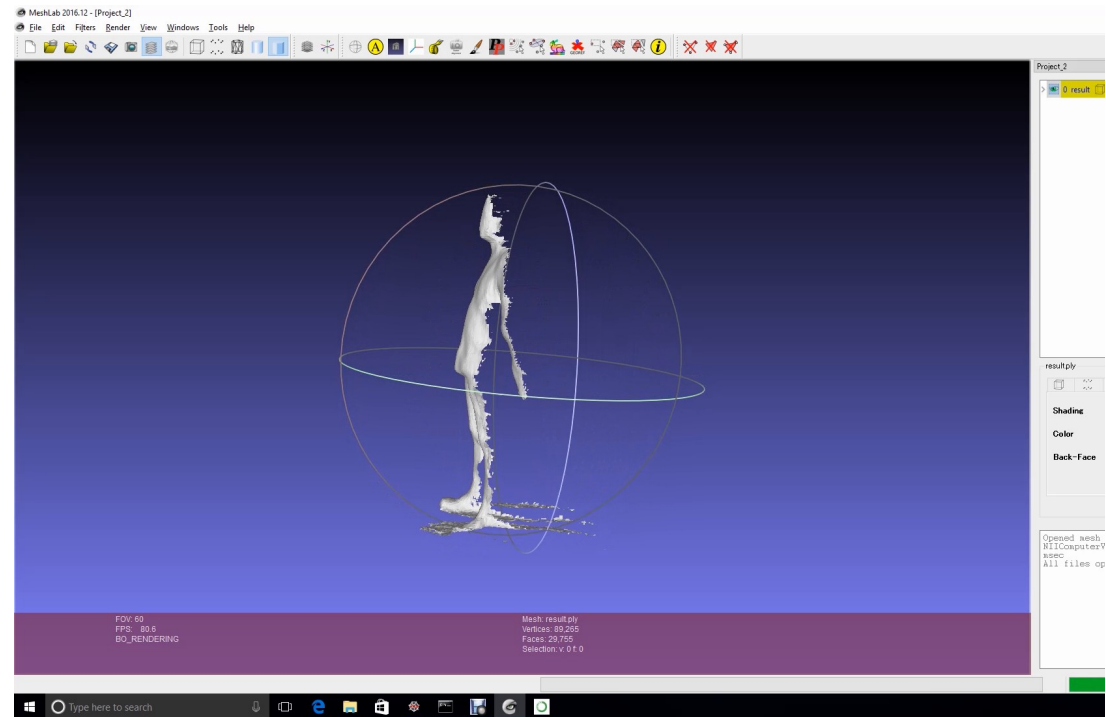
- Fusion 20 images



Progress

- Fusion 20 images

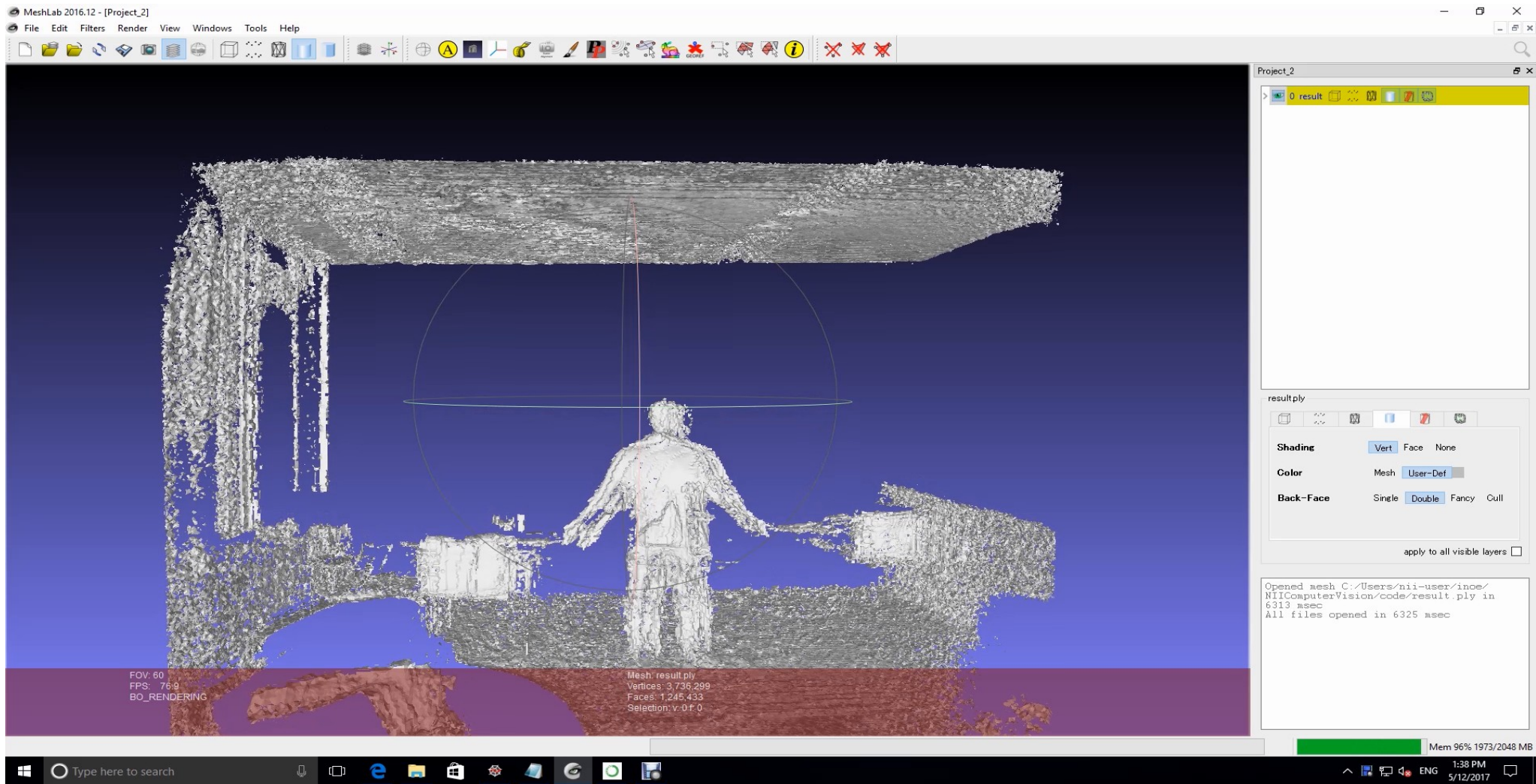
- (1) Get depth of new image
- (2) Align it with the former depth image
- (3) TSDF Fusion
- (4) Extraction Marching cubes' Meshes



Result

- Tracking with the Mesh
 - Take Meshes' Vertices and Normals
 - New Raw image : depth conversion + compute indexes in the camera view
 - Use these indexes in the Mesh's vertices and normals to do the correspondence between the new image and the Mesh.

Result



Action plan

- Fusion with tracking through the Global Mesh
- Then Fusion for each segmented body part separately:
 - Coordinates change one by one
 - Fuse one by one
 - All together

Q&A

- Will it be possible to manage memory for dynamics Fusion?