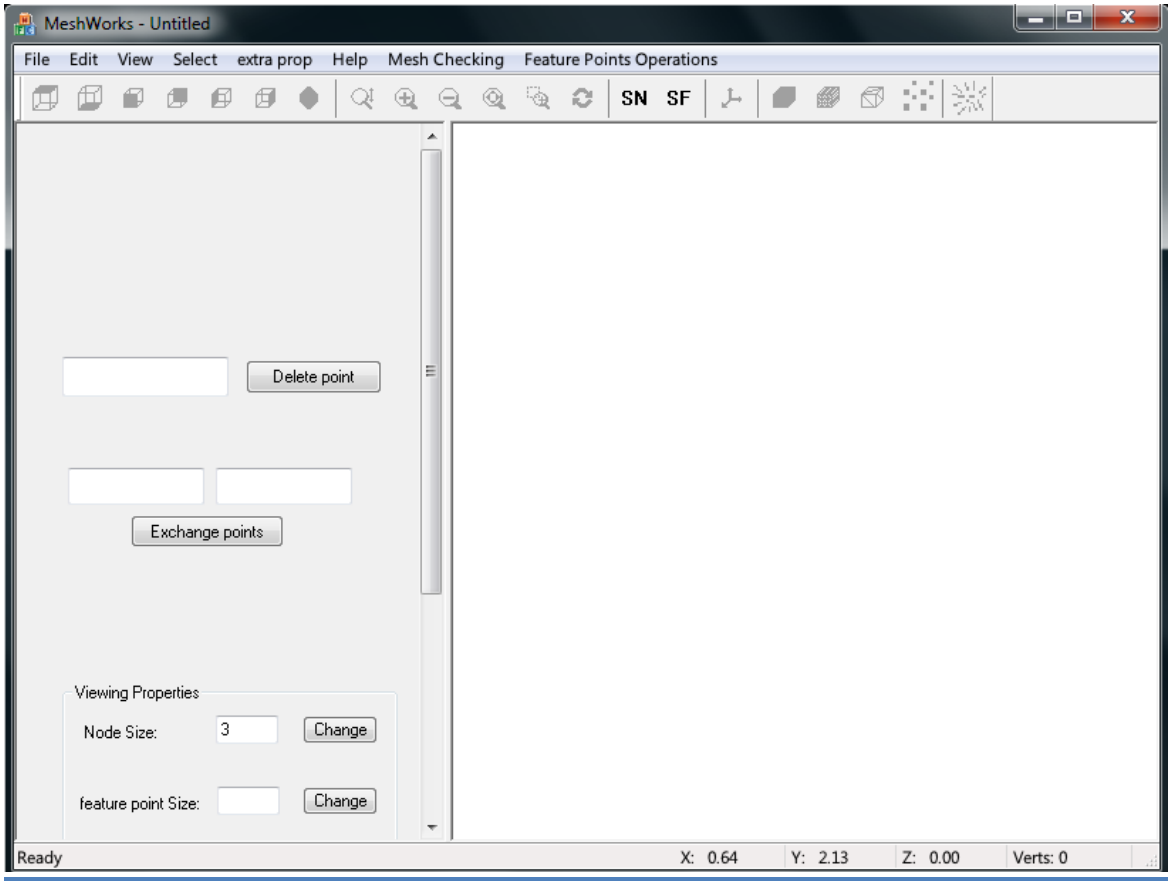
Input Requirements:

The input models must be:

1. Two-manifold (no non-manifold edges and vertices)
2. Will the same topology (i.e., same genus number)
3. Without any holes

Please double check your input models before doing cross-parameterization, otherwise you will always get errors.

6.1 Add_FP



"Add_FP" allows us to add feature points on a models with respect to a template

after the step of “Remesh”. We can exchange and delete the feature points on the model as well.

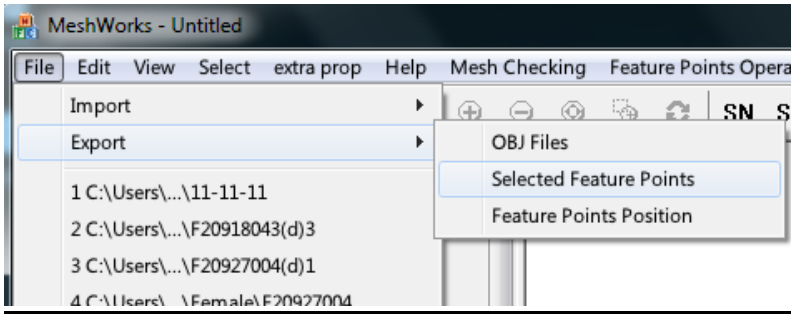
6.1.1 Basic skills to operate “Add_FP”

6.1.1.1 To read a model

Directly drag a model into the program.

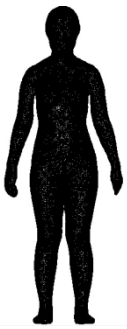
6.1.1.2 To export the feature points of a model

Go to the topmost toolbar. Select “File” -> “Export” -> “Selected Feature Points”. The feature points of the model will be exported with FPT.



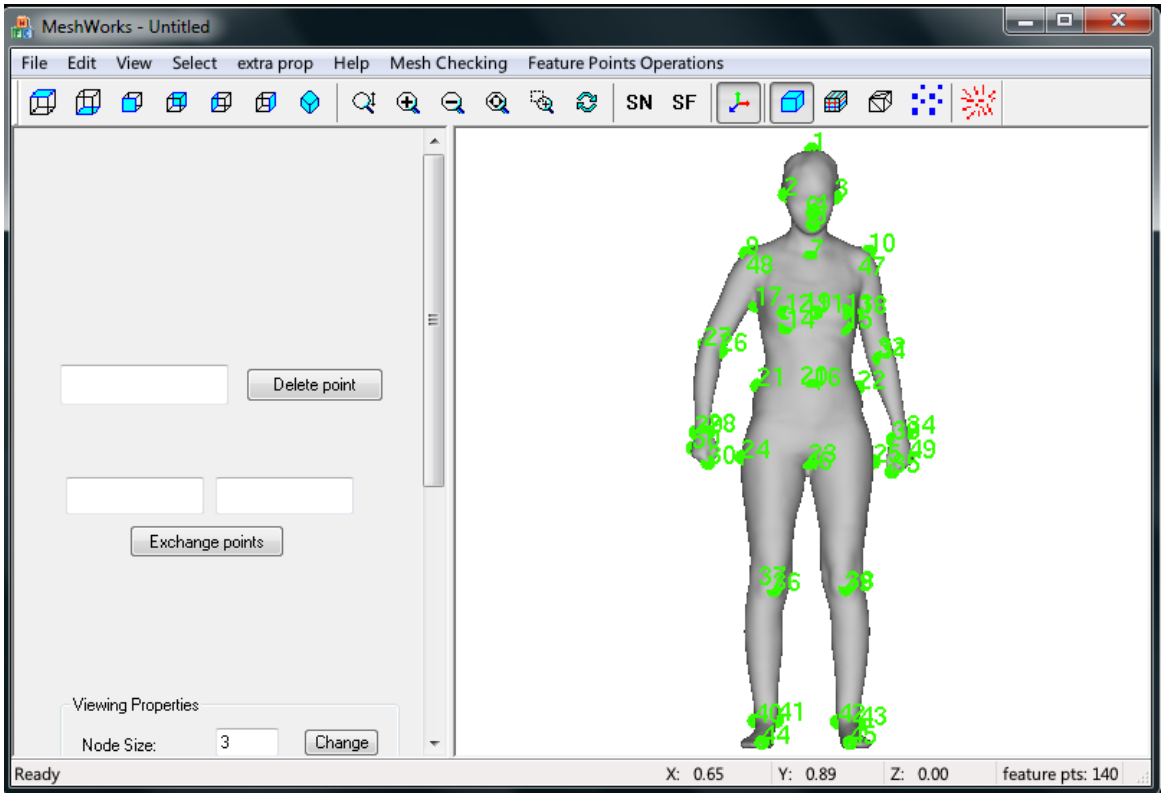
6.1.2 To add a feature point

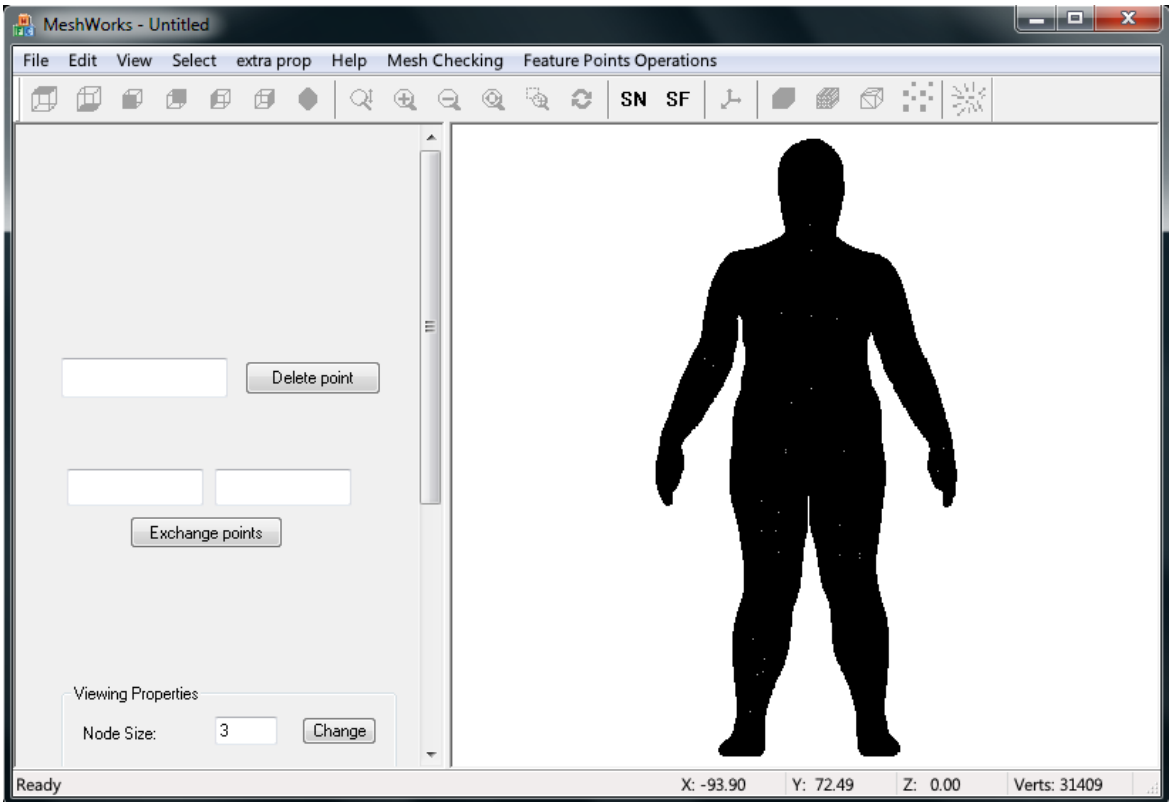
Press the “SN” button on the toolbar. Points are then shown up on the model.


(Before pressing “SN”)

(After pressing “SN”)

To add a feature point, we can directly left-click on a point of the model. We open another window of “Add_FP” to read a template and the

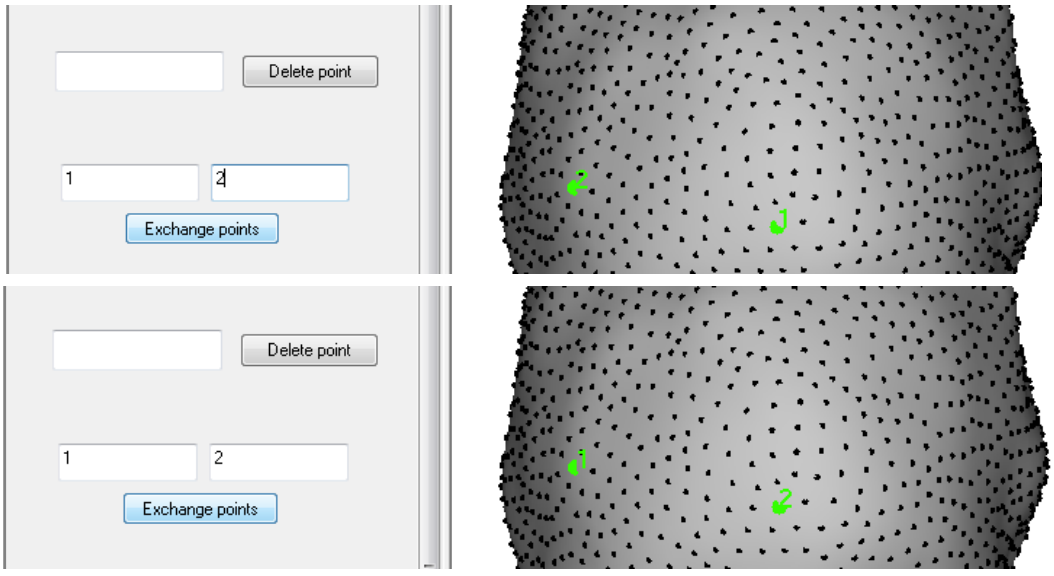
corresponding FPT file as reference. We need to be careful that all the feature points must be added in sequence with respect to the template and the locations of the feature points should be as accurate as possible.

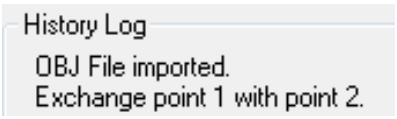




6.1.3 To swap feature points

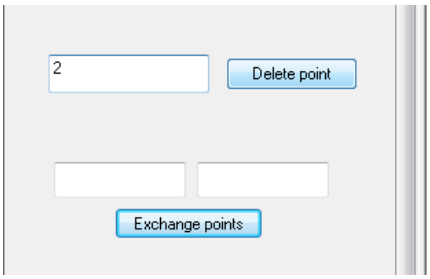
The “Exchange” function is to swap the location of two points. Go to the left hand side of the interface. Input the indices two feature points that we want to swap. Select the “Exchange points” button. The dialog box shows the information.

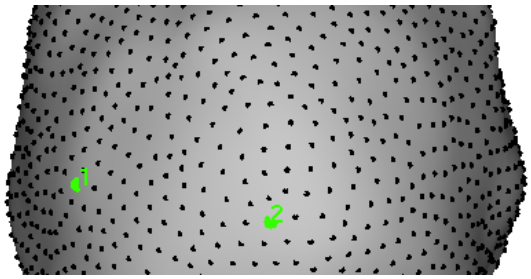


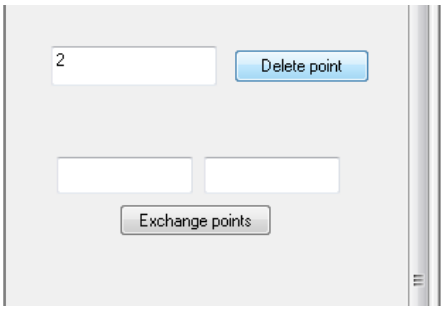


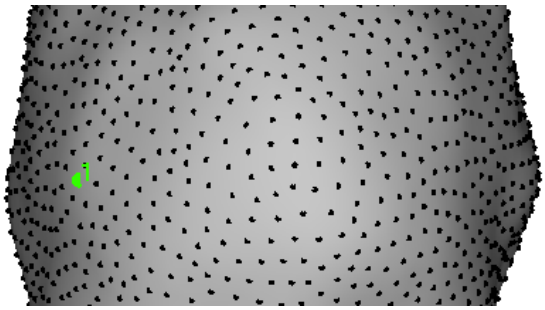
6.1.4 To delete a feature point

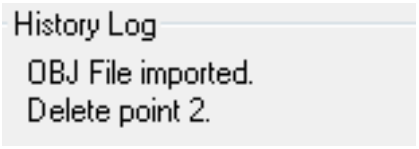
The “Delete” function is to remove the undesired point. Go to the left hand side of the interface. Input the index of the feature point that we want to remove. Select the “Delete point” button. The dialog box shows the information.





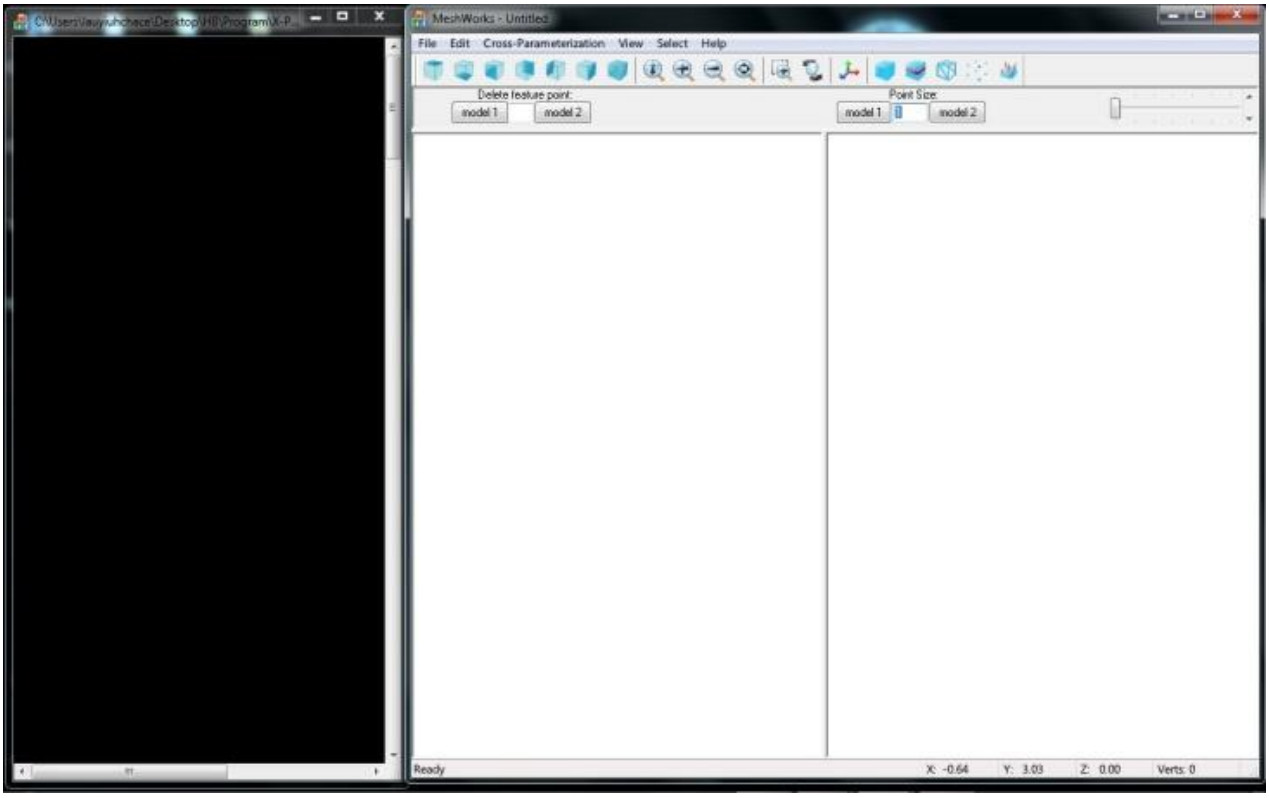






6.2 Cross-Parameterization

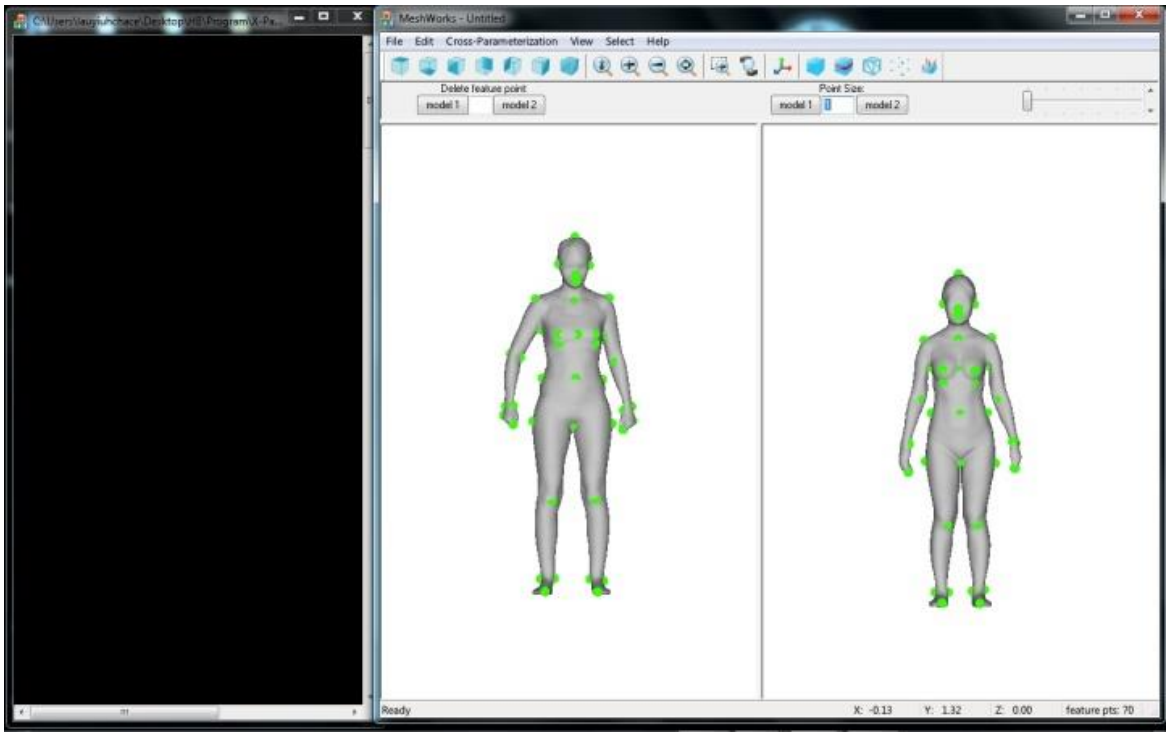
Inputs files: 2 obj and 2 fpt



6.2.1 Basic skills to operate “Cross-Parameterization”

6.2.1.1 To read models

Firstly, select the OBJ file and the corresponding FPT file of the template. Then drag them onto the program interface. Secondly, select the OBJ file and the corresponding FPT file of a model. Then drag them onto the interface. Please be noted that the cursor should be put above the OBJ file during dragging the files.

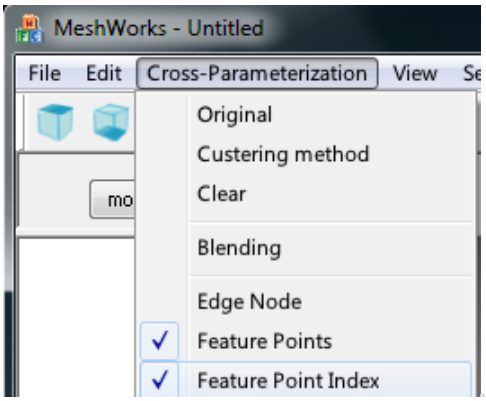


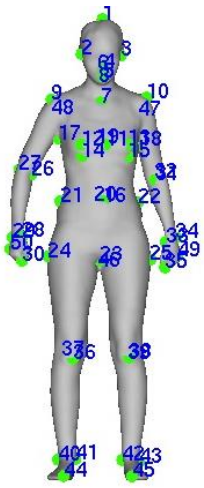
6.2.1.1.1 “Morphing”

This function is used to export OBJ files after Cross-Parameterization has done. Go to the topmost toolbar and select “File” -> “Export” -> “Morphing”. Five OBJ files will be exported. The file with the file name as filename**(5)** is the only desired output while the remaining files can be deleted. If output is in good condition, it will be the final output of the whole database preparation.

6.2.1.2 Basic skills to control a model

Refer to 2.1.1.3.
There are two divided sub-interfaces. We can only handle at most one model in all the time. If we want to handle the template or the model, we have to left-click the corresponding sub-interface once first.
To show the feature points’ index, go to the topmost toolbar and select “Cross-Parameterization” -> “Feature Point Index”.

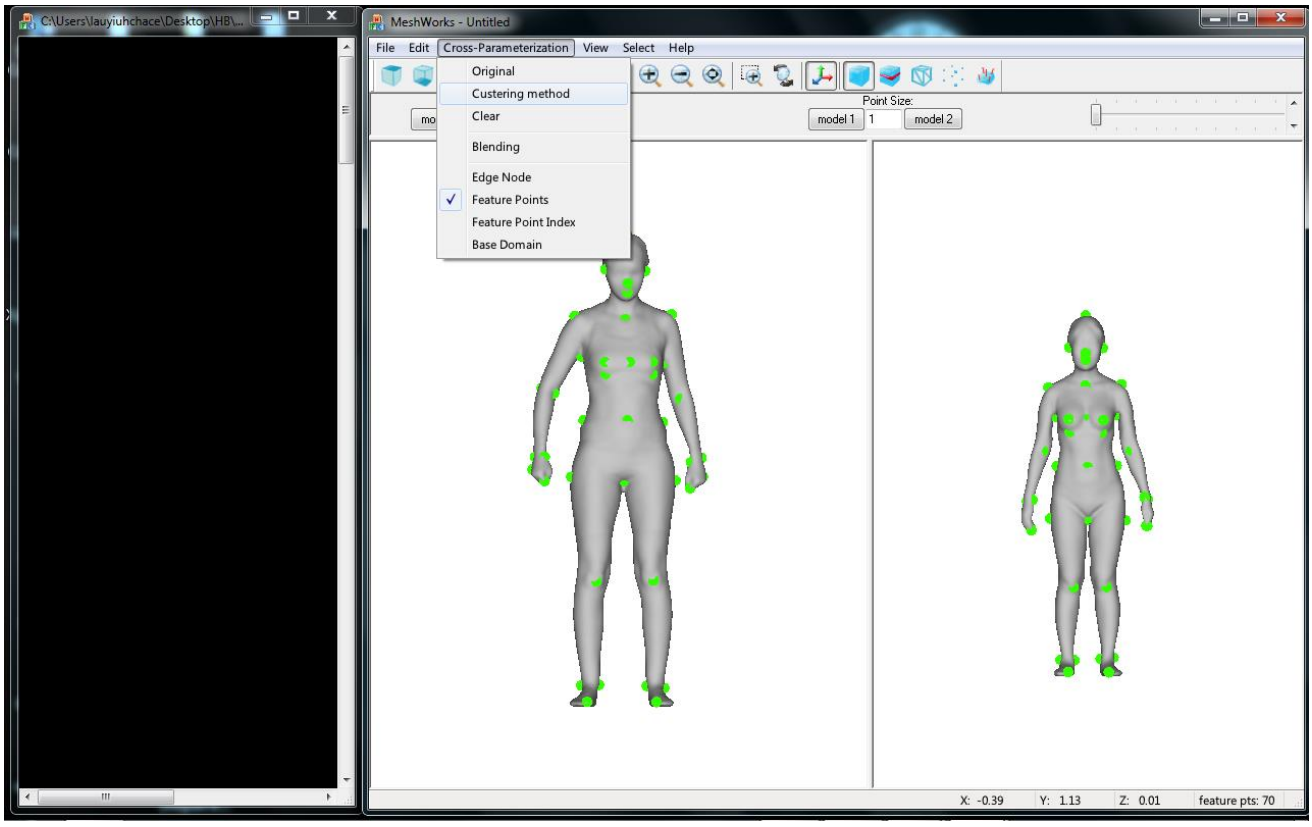


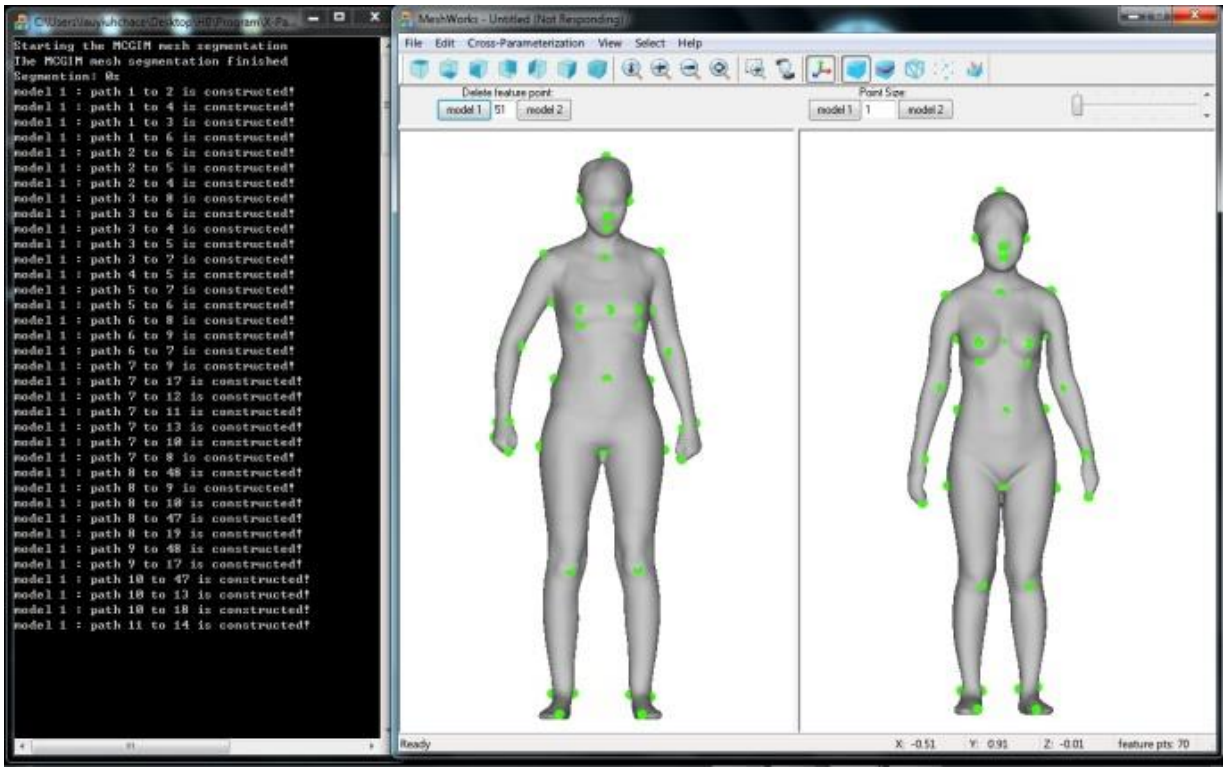


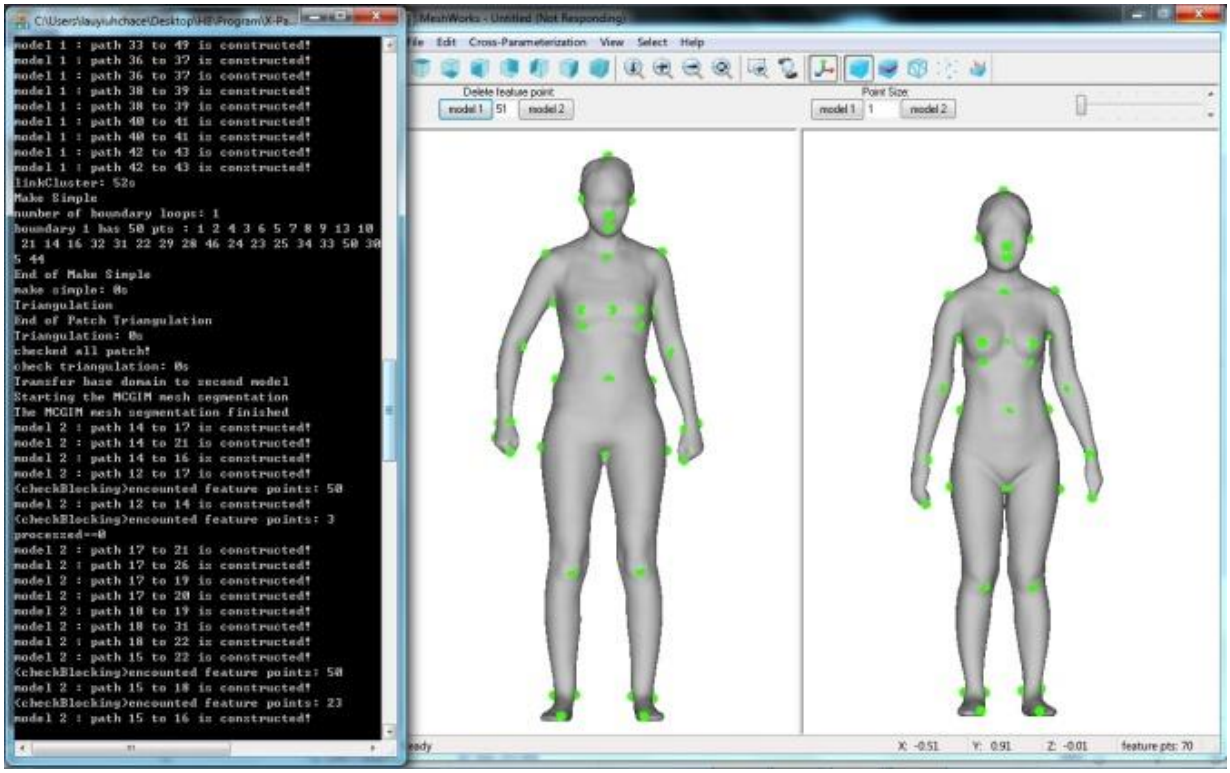
6.2.2 Steps of Cross-Parameterization

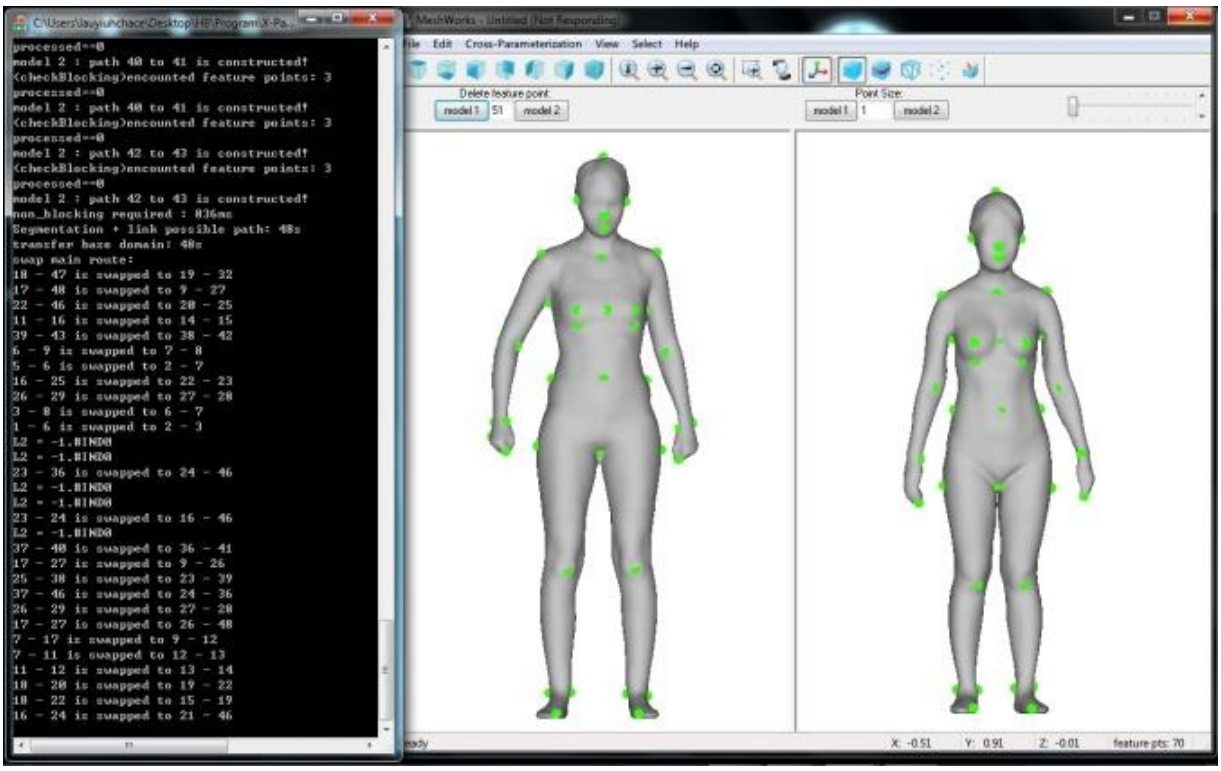
6.2.2.1 To proceed

When the template and the model are ready, go to the topmost toolbar and select “Cross-Parameterization” -> “Custering method”. The process starts automatically.

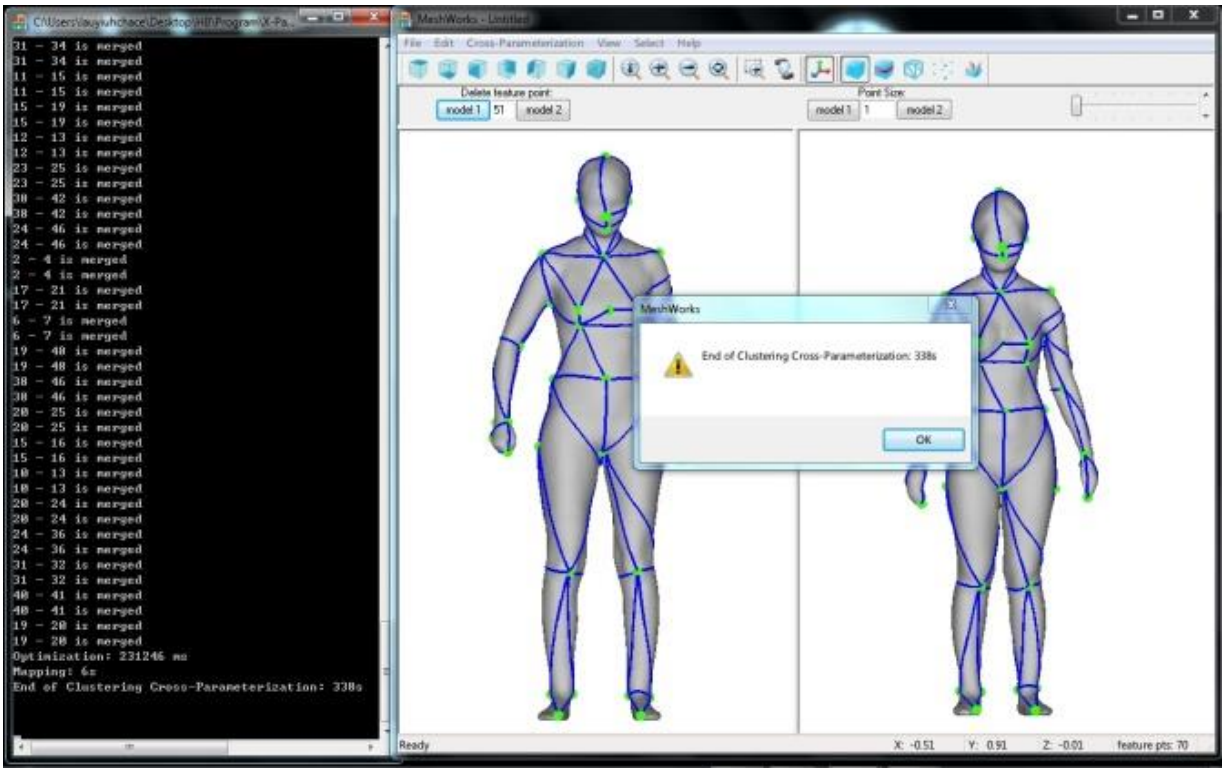



Starting the MCGIM mesh segmentation
The MCGIM mesh segmentation finished
Segmentinn: 0s
model 1 : path 1 to 2 is constructed!
model 1 : path 1 to 4 is constructed!
model 1 : path 1 to 3 is constructed!
model 1 : path 1 to 6 is constructed!
model 1 : path 2 to 6 is constructed!
model 1 : path 2 to 5 is constructed!
model 1 : path 2 to 4 is constructed!
model 1 : path 3 to 8 is constructed!
model 1 : path 3 to 6 is constructed!
model 1 : path 3 to 4 is constructed!
model 1 : path 3 to 5 is constructed!
model 1 : path 3 to 7 is constructed!
model 1 : path 4 to 5 is constructed!
model 1 : path 5 to 7 is constructed!
model 1 : path 5 to 6 is constructed!
model 1 : path 6 to 8 is constructed!
model 1 : path 6 to 9 is constructed!
model 1 : path 6 to 7 is constructed!
model 1 : path 7 to 9 is constructed!
model 1 : path 7 to 17 is constructed!
model 1 : path 7 to 12 is constructed!
model 1 : path 7 to 11 is constructed!
model 1 : path 7 to 13 is constructed!
model 1 : path 7 to 10 is constructed!
model 1 : path 7 to 8 is constructed!
model 1 : path 8 to 48 is constructed!
model 1 : path 8 to 9 is constructed!
model 1 : path 8 to 10 is constructed!
model 1 : path 8 to 47 is constructed!
model 1 : path 8 to 19 is constructed!
model 1 : path 9 to 48 is constructed!
model 1 : path 9 to 17 is constructed!
model 1 : path 10 to 47 is constructed!
model 1 : path 10 to 13 is constructed!
model 1 : path 10 to 18 is constructed!
model 1 : path 11 to 14 is constructed!
MeshWorks - Untitled (Not Responding)
File Edit Cross-Parameterization View Select Help
Delete feature point:
model 1 51 model 2
Point Size:
model 1 1 model 2
Ready
X: -0.51 Y: 0.91 Z: -0.01 feature pts: 70


model 1 : path 33 to 49 is constructed!
model 1 : path 36 to 37 is constructed!
model 1 : path 36 to 37 is constructed!
model 1 : path 38 to 39 is constructed!
model 1 : path 38 to 39 is constructed!
model 1 : path 40 to 41 is constructed!
model 1 : path 40 to 41 is constructed!
model 1 : path 42 to 43 is constructed!
model 1 : path 42 to 43 is constructed!
linkCluster: 52o
Make Simple
number of boundary loops: 1
boundary 1 has 50 pts : 1 2 4 3 6 5 7 8 9 13 10
21 14 16 32 31 22 29 28 46 24 23 25 34 33 50 38
5 44
End of Make Simple
make simple: 0s
Triangulation
End of Patch Triangulation
Triangulation: 0s
checknd all patch!
check triangulation: 0s
Transfer haze domain to sncond model
Starting the MCGIM mesh segmentation
The MCGIM mesh segmentation finished
model 2 : path 14 to 17 is constructed!
model 2 : path 14 to 21 is constructed!
model 2 : path 14 to 16 is constructed!
model 2 : path 12 to 17 is constructed!
<checkBlocking>encounted feature points: 50
model 2 : path 12 to 14 is constructed!
<checkBlocking>encounted feature points: 3
processed==0
model 2 : path 17 to 21 is constructed!
model 2 : path 17 to 26 is constructed!
model 2 : path 17 to 19 is constructed!
model 2 : path 17 to 20 is constructed!
model 2 : path 18 to 19 is constructed!
model 2 : path 18 to 31 is constructed!
model 2 : path 18 to 22 is constructed!
model 2 : path 15 to 22 is constructed!
<checkBlocking>encounted feature points: 50
model 2 : path 15 to 18 is constructed!
<checkBlocking>encounted feature points: 23
model 2 : path 15 to 16 is constructed!
MeshWorks - Untitled (Not Responding)
File Edit Cross-Parameterization View Select Help
Delete feature point:
model 1 51 model 2
Point Size:
model 1 1 model 2
X: -0.51 Y: 0.91 Z: -0.01 feature pts: 70



There will be a pop-up window when the process has done successfully.

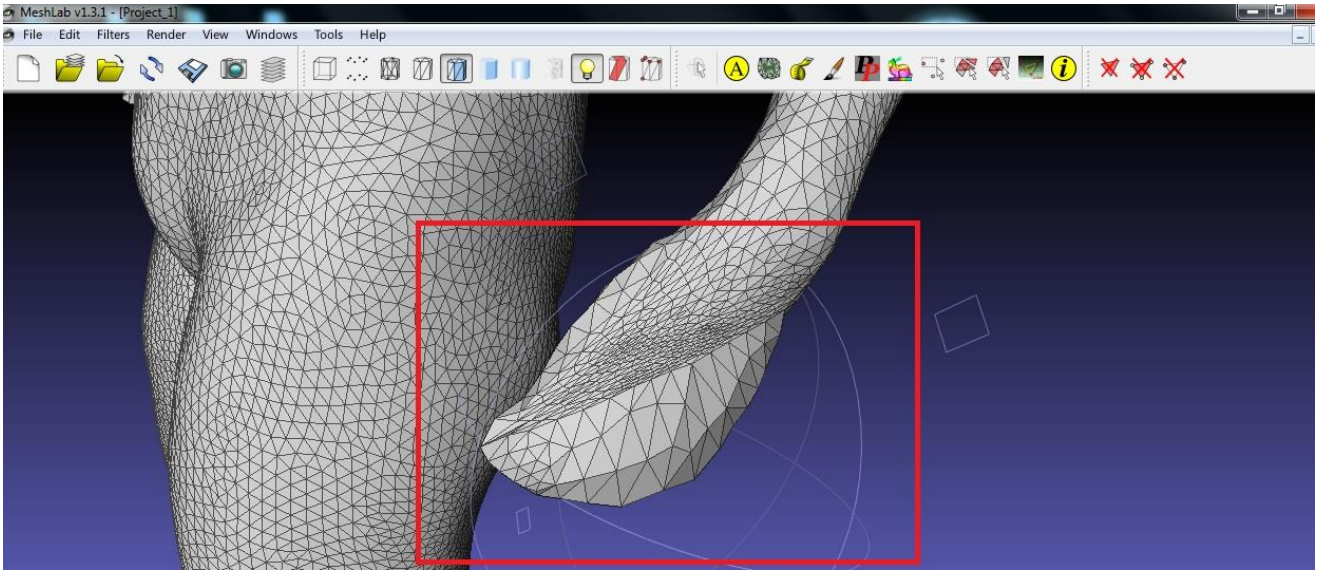


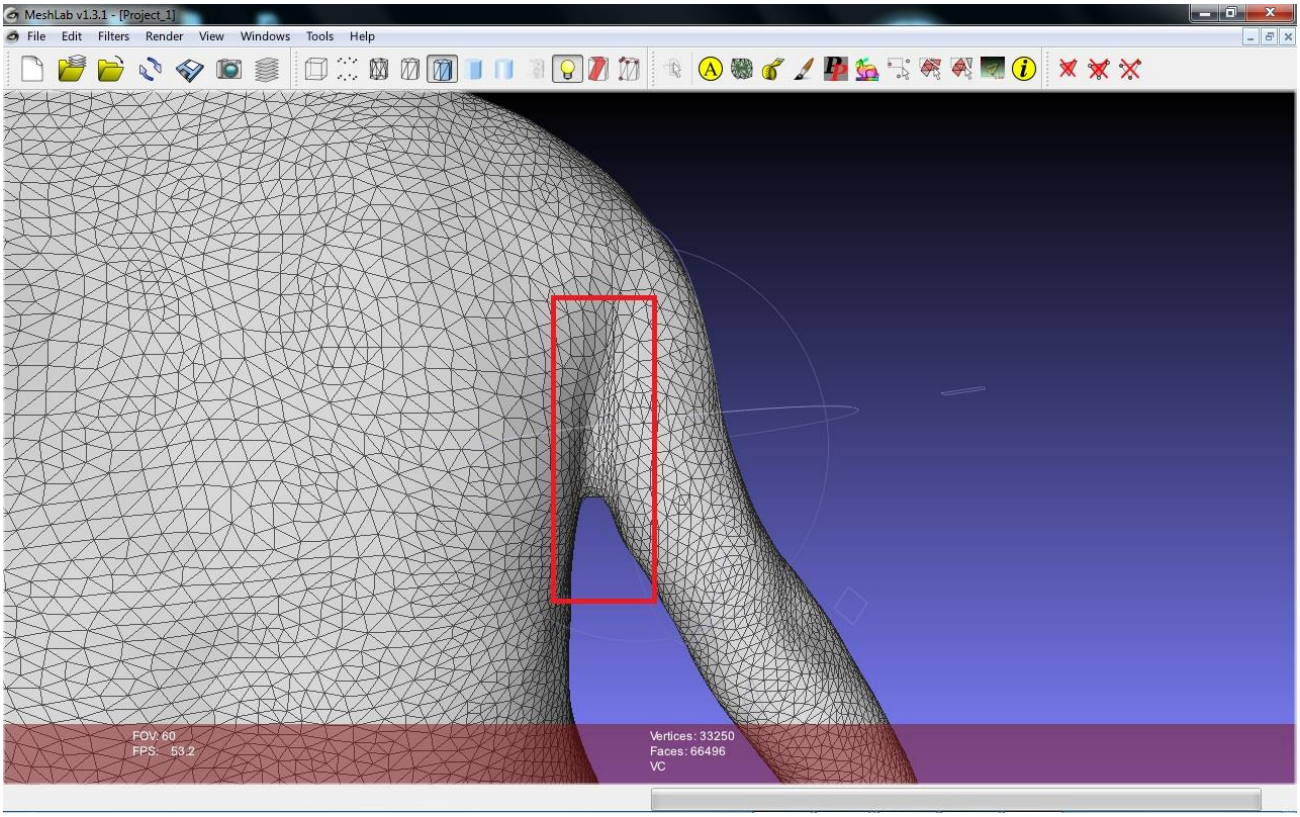
Export the model by “Morphing”.

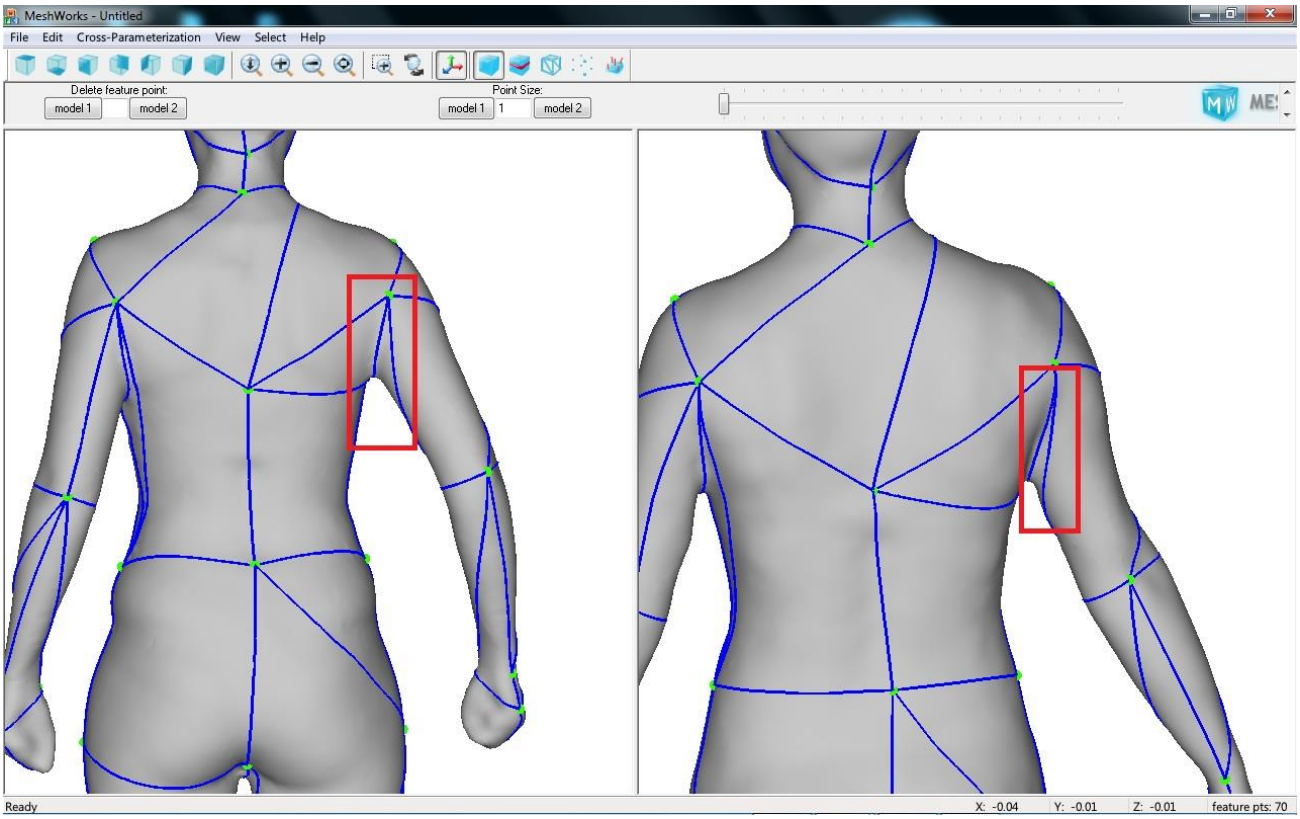
6.2.2.2 To check the quality

The quality of the product is regarded as good if the surfaces of the

model are smooth. There is none of stretching of face, all the triangles are evenly spaced. The following pictures are examples of stretching of faces. To deal it, we should alter the location of the feature points or add more to the model and the template.



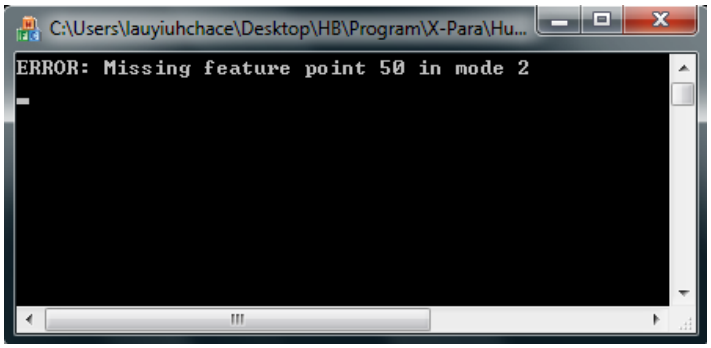




6.2.3 Reasons of failure in “Cross-Parameterization”

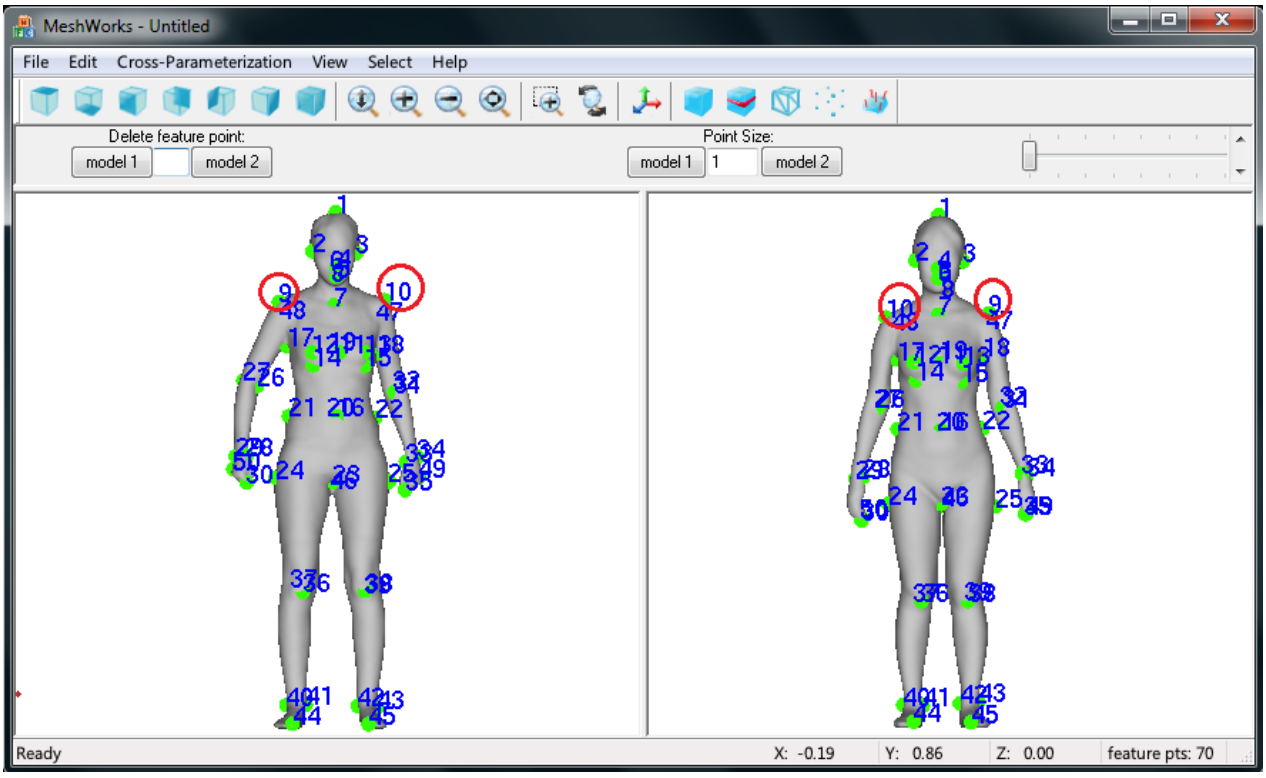
6.2.3.1 Missing feature points

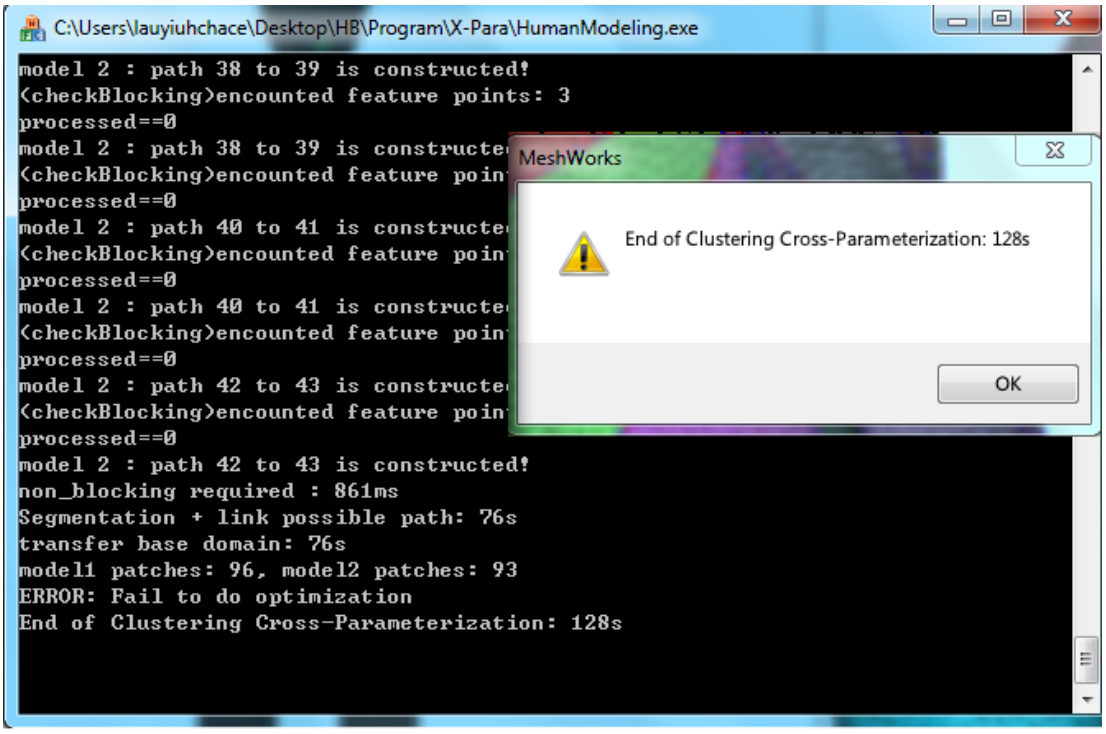
“Cross-Parameterization” does not start if the number of feature points on the template and the model are not equal.

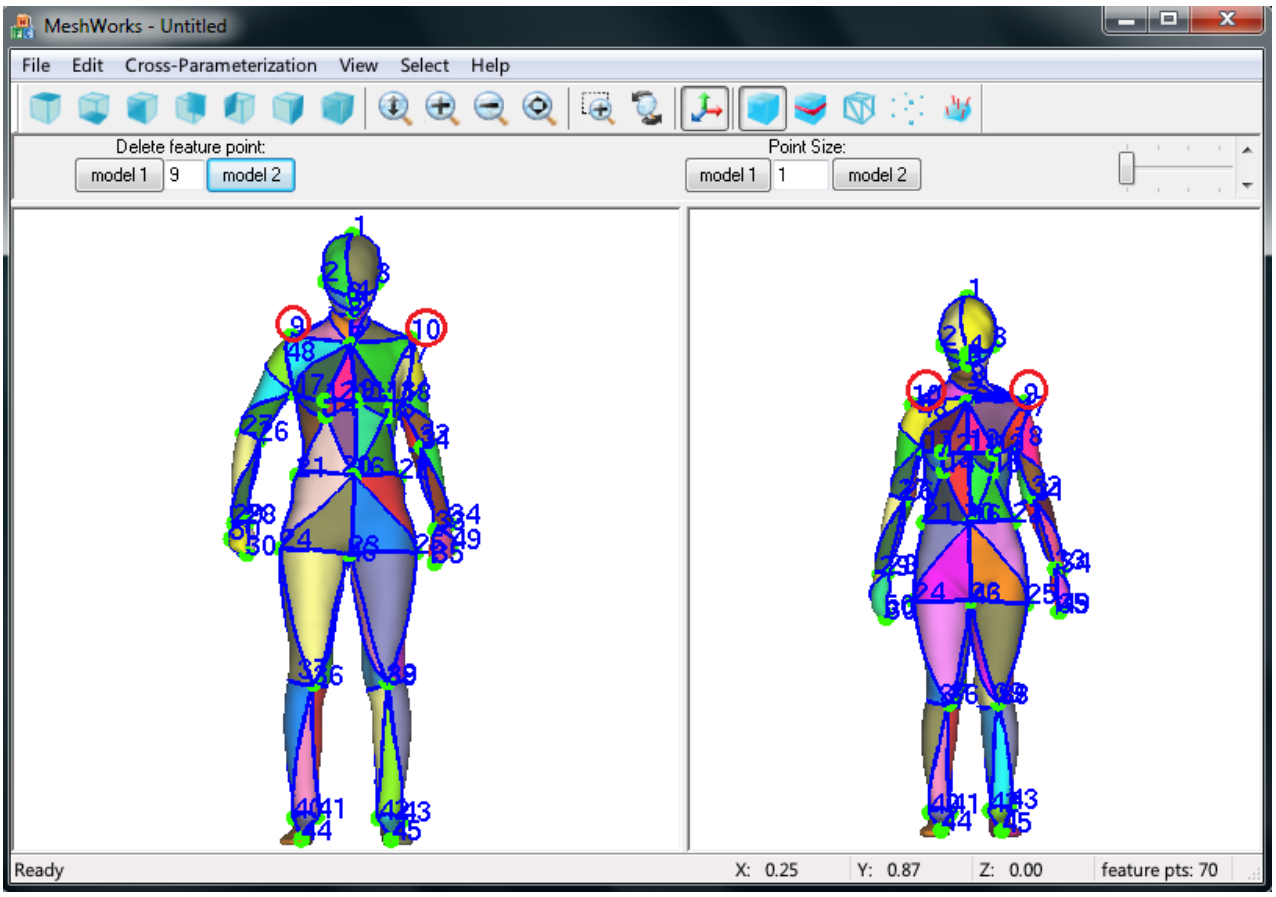


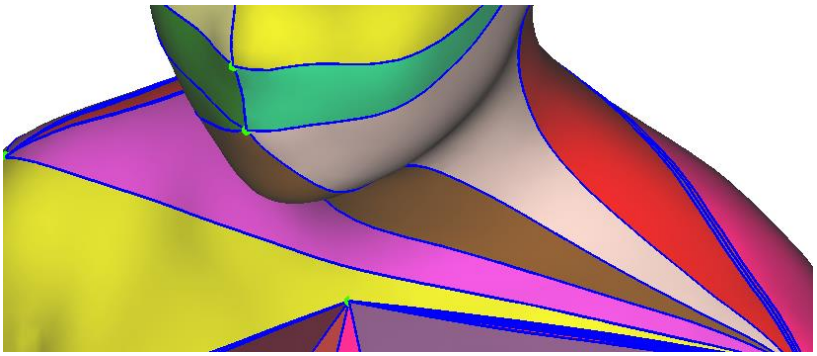
6.2.3.2 Wrong location of the feature points

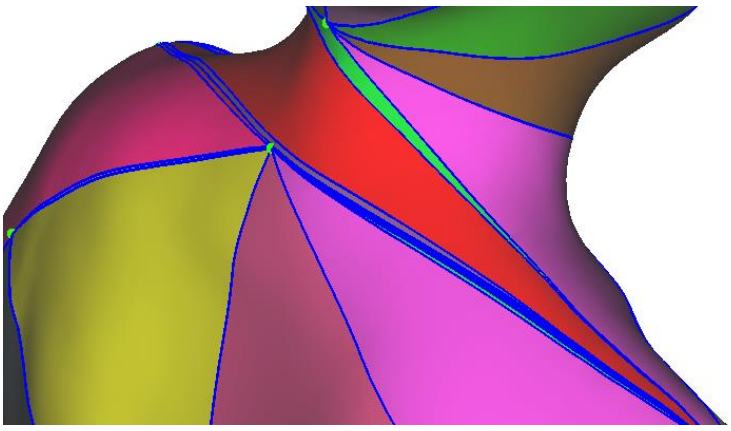
There are errors about the feature points on the template and the model such as the sequence is wrong or the locations of the feature points are deviated severely.


MeshWorks - Untitled
File Edit Cross-Parameterization View Select Help
Delete feature point:
model 1
model 2
Point Size:
model 1
1
model 2
Ready
X: -0.19
Y: 0.86
Z: 0.00
feature pts: 70


C:\Users\lauyiuhchace\Desktop\HB\Program\X-Para\HumanModeling.exe
model 2 : path 38 to 39 is constructed!
(checkBlocking)encounted feature points: 3
processed==0
model 2 : path 38 to 39 is constructe
(checkBlocking)encounted feature poin
processed==0
model 2 : path 40 to 41 is constructe
(checkBlocking)encounted feature poin
processed==0
model 2 : path 40 to 41 is constructe
(checkBlocking)encounted feature poin
processed==0
model 2 : path 42 to 43 is constructe
(checkBlocking)encounted feature poin
processed==0
model 2 : path 42 to 43 is constructed!
non_blocking required : 861ms
Segmentation + link possible path: 76s
transfer base domain: 76s
model1 patches: 96, model2 patches: 93
ERROR: Fail to do optimization
End of Clustering Cross-Parameterization: 128s
MeshWorks
End of Clustering Cross-Parameterization: 128s
OK


MeshWorks - Untitled
File Edit Cross-Parameterization View Select Help
Delete feature point:
model 1 9 model 2
Point Size:
model 1 1 model 2
Ready
X: 0.25 Y: 0.87 Z: 0.00 feature pts: 70





7 Flow description

7.1 Word description

7.1.1 This step is to add feature points to the model with respect to a template.

Remember to add the feature points in sequence and with accuracy.

REFER TO 6.8.2

7.1.2 The final step is to proceed “Cross-Parameterization”. If the result is in good condition, the model can be treated as the final product to the whole database preparation.

REFER TO 6.9.4