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Create Dynamic Cloth With Dynamic Tessellation

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Author

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DaremoK3

Posted: 22 Oct 2010 01:39

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Joined: 10 Oct 2003
Posts: 175

Hi all...

Here is a work flow I came up with utilizing free software for Dynamic Tessellation for your Dynamic Clothing. It will benefit both Poser and DAZ Studio (when plug-in available) users.

While we all wait for a clothify or create-from-scratch clothing plug-in for DS to use in conjunction with OptiTex available Dynamic Clothing I have been reading a lot of forums regarding this issue, so I went back to Dynamic Cloth Simulation research.

The following tips are based on free software that can simulate the necessary correct tessellation needed in dynamic clothing for the best possible folds as outputted by expensive applications such as Maya, 3DSMax, Lightwave, Marvelous, and etc.

First of all, Dynamic Cloth is best simulated with a hap-hazard triangulation algorithm at a high tessellation for clean folds as opposed to quad tessellation, or even triangulated quad tessellation. Both will work for dynamic cloth, but are not optimized for the folds.

Based on my studies (not confirmed by software developers), the tessellation algorithm used by the expensive applications is the Delaunay triangulation tessellation. More importantly, the Delaunay conforming (equilateral TriMesh) algorithm. The basic Delaunay tessellation would result in bad topology for folding cloth, but O.K. for terrain building.

Now, this is important for two reasons. One, if you create your own cloth mesh from scratch to be clothified, and two, if you would like to convert a conforming clothing item to be clothified and use in the cloth simulator.

Please read my next post for details and software used.



Take care all...
Ken



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DaremoK3

Posted: 22 Oct 2010 01:41

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Joined: 10 Oct 2003
Posts: 175

I used two free applications to achieve the results in the pictures below. Wings3D, and Sculptris (alpha version over at ZBrush).

You can use any software you like, and whatever method known or available to you to create or convert your cloth. As far as I know, only Sculptris will apply the Delaunay conforming tessellation. If anyone knows of another free application with this ability, I would like to know.

This is not an automatic translation process. There is work involved on your end, but with a little patience and perseverance you can achieve quality topology.

See attached pics for detailed proof-of-concept.

Work flow:

After creating/converting your cloth model, triangulate it and then save as OBJ. Sculptris wants triangulated OBJ's. (I made the mistake of not triangulating model first time I tried, and Delaunay tessellation viewed successful in Sculptris, but exported model was all quads that were simply moved around)

Then open up Sculptris and import your model as new model.

All you will need is a couple of the brushes, parameter changes, and a little practice. Do not try to "sculpt" detail into your mesh and change your outlying form (unless desired).

First, use the mask brush to "brush" in tessellation detail. A few factors will come into play. You can get very tiny and dense topology depending on brush size, strength, and zoom factor in view port. Play around until you find a comfortable density you are happy with (don't forget about "undo"). If you feel it is too dense in spots or overall, then use the decimate brush to make the topology less dense. You are aiming for med-high to high density for great cloth folds.

Be very careful around open boundaries such as neck, arm/leg, or waist holes. Getting too close to edge boundaries with these brushes can change the underlying form, which you definitely want to keep. You can change the soft/hard boundary in options when around edges to help maintain edge lines.

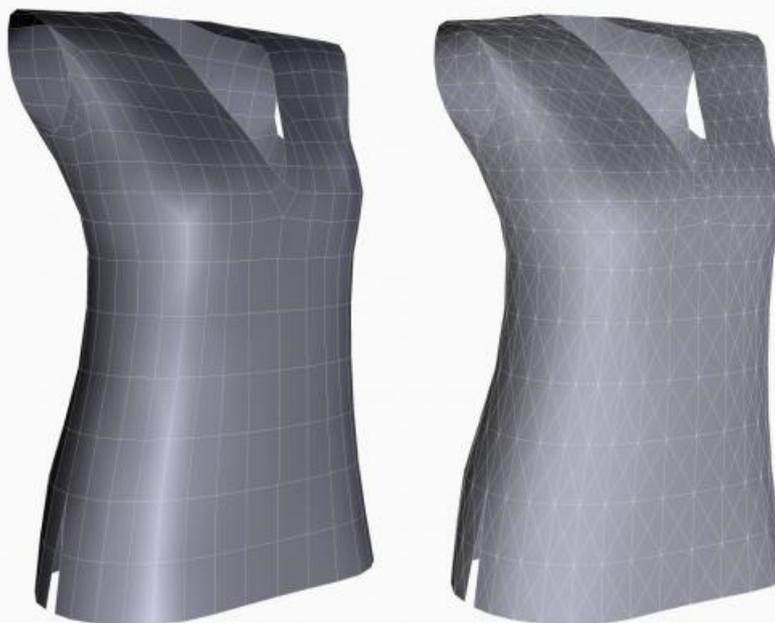
Second, use the smooth brush (hold shift and paint) to smooth out and equalize the tessellation either over entire model or just in spots you deem necessary.

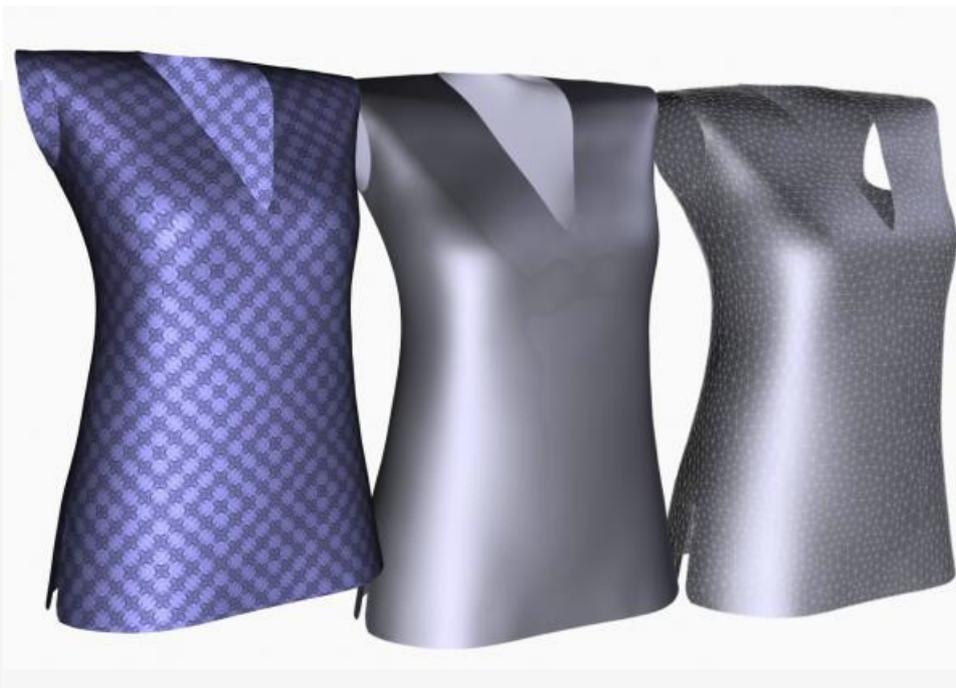
Third (optional), go into paint mode to auto assign UV mapping. The mapping is fine for painting within the application across seams, but you will probably need to remap in another program to paint in 2D apps or attach tillable textures. (I mapped here then remapped in UVMapper, and again in Roadkill UV mapper to fix stretching issues).

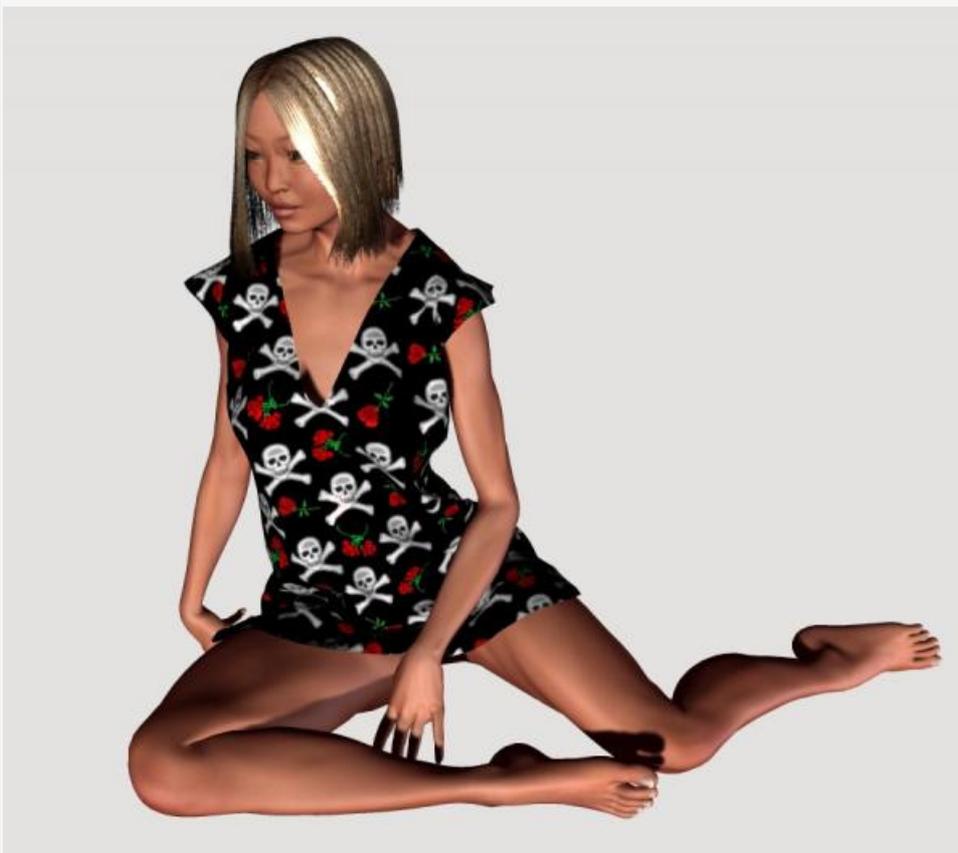
Below are my results, and rendered examples in Poser 6 utilizing Cloth Room Sim:

Please feel free to post questions, concerns, or correct me where needed.

Forgot to note: First pic is original model and then hand triangulated (no need to do, just auto-triangulate). Second pic is resulting mesh after Sculptris and Roadkill (for the texturing).







Take care all...
Ken



Last edited by DaremoK3 on 22 Oct 2010 01:52; edited 2 times in total

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Fauvist

Posted: 22 Oct 2010 03:21

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Does this give different results from just using the Poser cloth room?

Joined: 09 Aug 2008
Posts: 797

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DaremoK3



Joined: 10 Oct 2003
Posts: 175

Posted: 22 Oct 2010 03:38

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Fauvist:

Is your question referring to once you push the "clothify" button in Poser's Cloth Room that it will automatically tessellate the model?

I am unaware if this is the case, and will need to test this. I believe it does not, but need to confirm. As far as I know, when you clothify an object in Poser, you are just letting the simulator know what model to apply the gravity, collisions, and wind algorithms (if applied) to.

Great question. Would save a lot of work if it does the tessellation as well.

Take care all...
Ken



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DaremoK3

Posted: 22 Oct 2010 08:12

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Joined: 10 Oct 2003
Posts: 175

Back from testing and results are in.

NOPE!

The Cloth Room Simulator does not tessellate the model, so you will only get results as good as the model is already pre-tessellated.

Hence the reason for this entire exercise.

Below is the result of "clothifying" a conforming P4 Male Duster Jacket (after preparation/modding). First pic shows the default topology before clothify. Second pic shows result of topology after simulation completion. Absolutely no change, and the folds are craptacular.

Regardless if you create your own model for cloth simulation, or modify a conforming model to be clothified, I believe you still need to optimize the topology as outlined in my work flow above, or something similar.





Take care all...
Ken



Last edited by DaremoK3 on 22 Oct 2010 08:13; edited 1 time in total

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English Bob



Joined: 10 Oct 2003
Posts: 853
Location: Cambridge, UK

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Posted: 22 Oct 2010 09:44

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Fascinating - I will be trying this for myself. Thanks very much for the research.

I think Fauvist had misunderstood slightly - this is a method for preparing a mesh for use in the Poser Cloth Room, it doesn't do any simulation itself.

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