

This document is to show how nCloth simulation was carried out to stitch and pose a jacket created with [jc.clothes](#). This is not a tutorial. It just contains some notes to remind myself of what I did and how I made decisions. All simulations were performed in the same scene. Simulation times varied from half to one hour for each stage in my P4 machine. The following video shows the simulation sequences joined together and how constraints were used to carry out posing:



Under the jacket, there're two other layers: shirt and pant, whose deformation sequences were saved to cache before carrying out simulation for the jacket. The process was:

1. Perform pant stitching
2. Make pant default pose passive
3. Perform shirt stitching (on top of passive pant)
4. Make shirt default pose passive
5. Perform jacket stitching (on top of passive shirt and pant)
6. Perform pant posing and save to cache
7. Perform shirt posing and save to cache (on top of cached pant)
8. Perform jacket posing (on top of cached shirt and pant)

Steps 7 - 8 were iterated several times as there were several stages of posing.

Jacket Stitching Sequence (jacketN_1)

Frame	1	30	40	45	47	50	60	Change
Enable constraints	0			1				step
Stretch Resist	15					30		step
Compress Resist	10					20		step
Bend Resist	0.1					0.2		step
Self Collide	0				1			step
Self Collide Width Scale	0.7							

Self Collision Flag	3						
Self Trapped Check	0				1		step
Max Self Collide Iter	8						
Max Collision Iter	16						
Substeps	5	10			20		linear
Time Scale	1						
Space Scale	1		0.1				step

- Adjacent stitches were not attached to avoid some rotation problems (in back pattern) and stitch (between hat and body) being moved out of place.
- Rotation and translation of inside arm stitches were keyed at frame 17 to avoid collision with arms.

Jacket Posing Sequence 1 (jacketN_2)

Frame	1	20	40
Pose	default		hat down
Self Collision Flag	4		
Max Self Collide Iter	4		
Trapped Check	0		
Self Trapped Check	0		
Substeps	5	30	
Max Collision Iter	12		
Space Scale	0.1		

- Vertices in hat and collar have bend resistance 0 and stretch resistance 0.5 per-vertex to make it easier to deform.
- This is actually a wrong demonstration because substeps value is higher than max collision iteration. Never mind.

Jacket Posing Sequence 2 (jacketN_3)

High substeps and max collision iteration values were required to make the jacket stable through simulation. Space scale value 0.5 was required to create the "thick" wrinkles.

IMPORTANT: There were two posing stages, jacketN_3 and jacketN_3a, because if these two actions were performed in one attempt, the simulation would never be stabilized at a certain frame. This was a valid way to avoid it as I was not doing animation. Increasing number of frames may also be a valid way to perform the action. But I haven't tried it.

Frame	1	12	25	30	change
Pose	hat down			right arm up	

Self Collision Flag	4				
Trapped Check	0				
Self Trapped Check	0	1 (for 1 frame only)			
Sort Stretch Links	0				
Max Self Collide Iter	16		80		spline
Max Collision Iter	8		80		spline
Substeps	5		8		step
Space Scale	0.5				

- Self Trapped Check has a side effect that when simulation becomes unstable at frame 12, turn it on and simulate frame 12, then turn it off again and go back to simulate from frame 12, that instability will be gone.
- Self Trapped Check would smooth out wrinkles. So avoid it as much as you can.
- Self Trapped Check would almost double simulation time.

Jacket Posing Sequence 3a (jacketN_3a)

Frame	1	10	20	25	30	change
Pose	right arm up				sitting	
Self Collision Flag	4					
Trapped Check	0					
Self Trapped Check	0			1		step
Sort Stretch Links	0					
Max Self Collide Iter	16			80		spline
Max Collision Iter	16			80		spline
Substeps	5			8		linear
Space Scale	0.1					

Jacket Posing Sequence 3b (jacketN_3b)

Fix wrinkles and zipper.

Frame	1	10	change
Pose	sitting		
Self Collision Flag	4		
Trapped Check	0		
Self Trapped Check	1		

Sort Stretch Links	0		
Max Self Collide Iter	50		
Max Collision Iter	50		
Substeps	5		
Space Scale	0.1		

- Self collision thickness for vertices along the zipper was set to zero so as to join the two sides.