

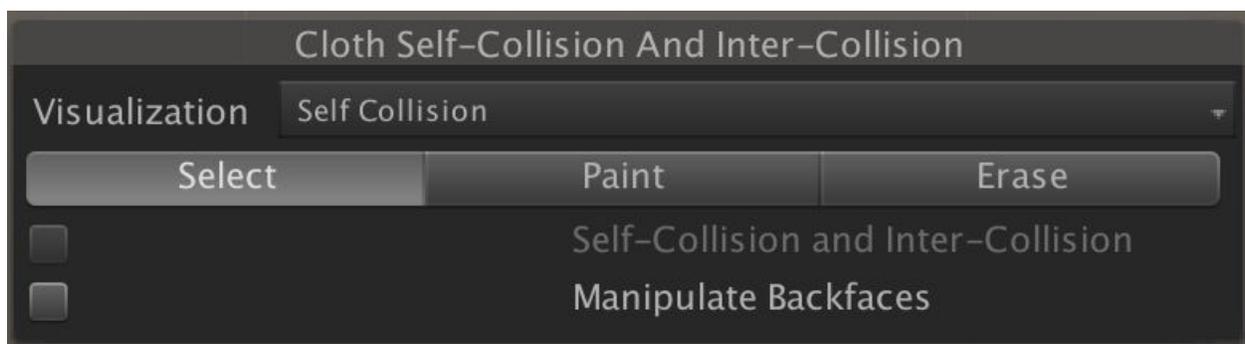
Unity Cloth Improvements

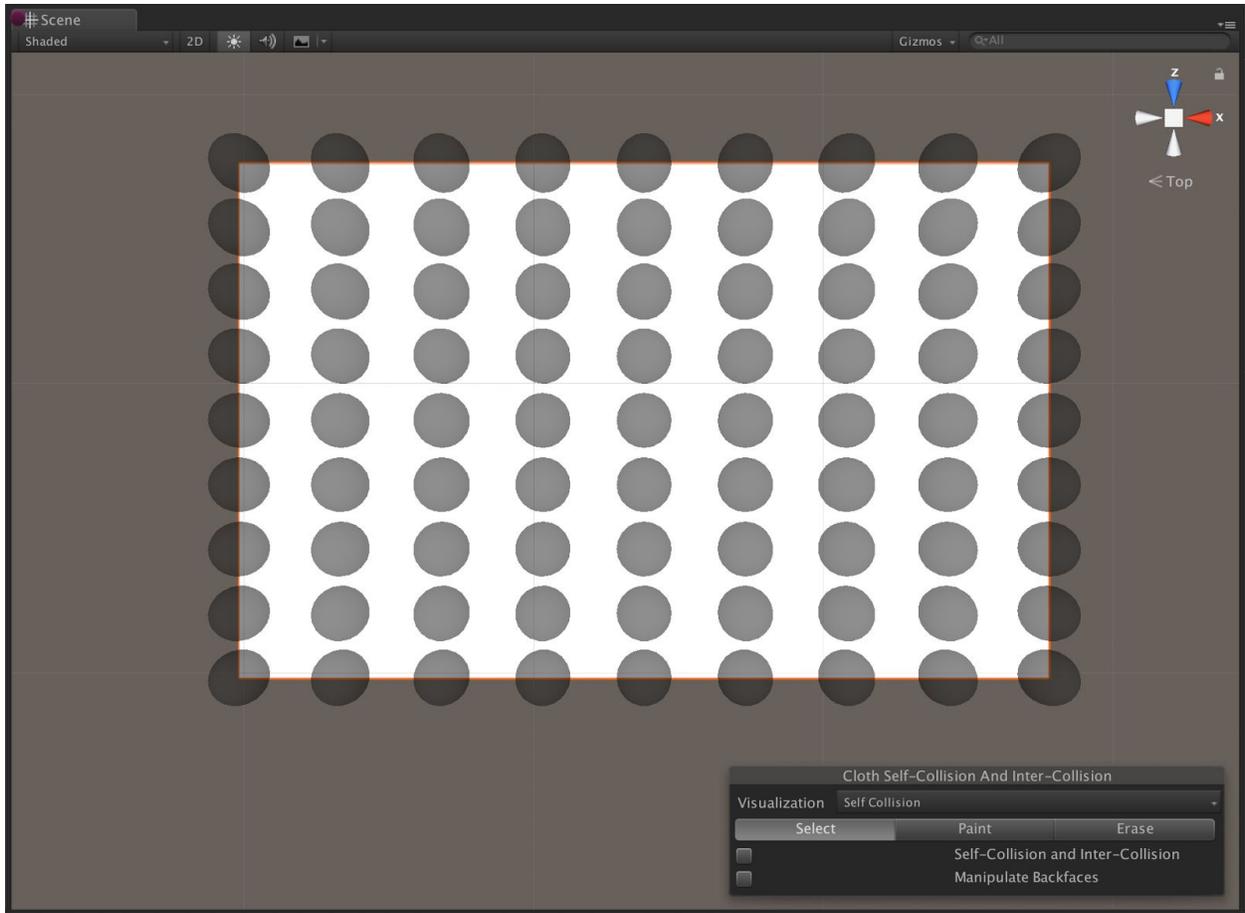
Cloth Self-Collision

The particles of a cloth object can collide among themselves.

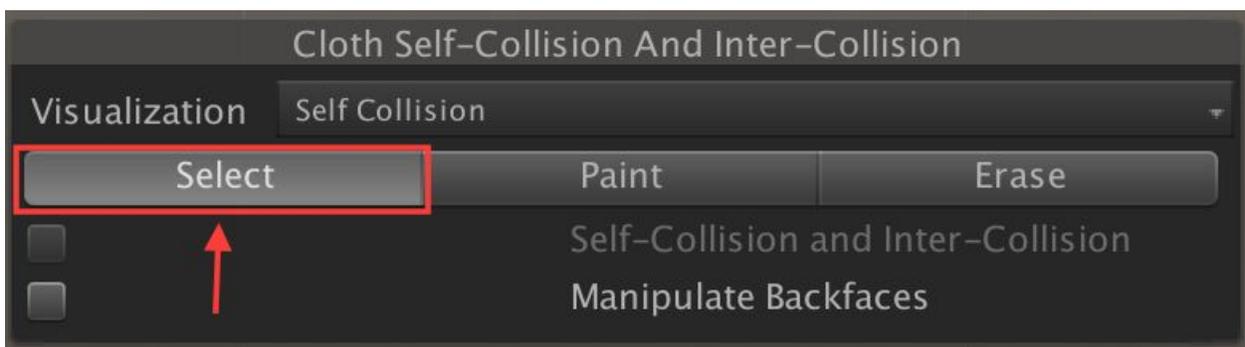


Select Self and Inter collision editing tools in the cloth inspector. (see above image)

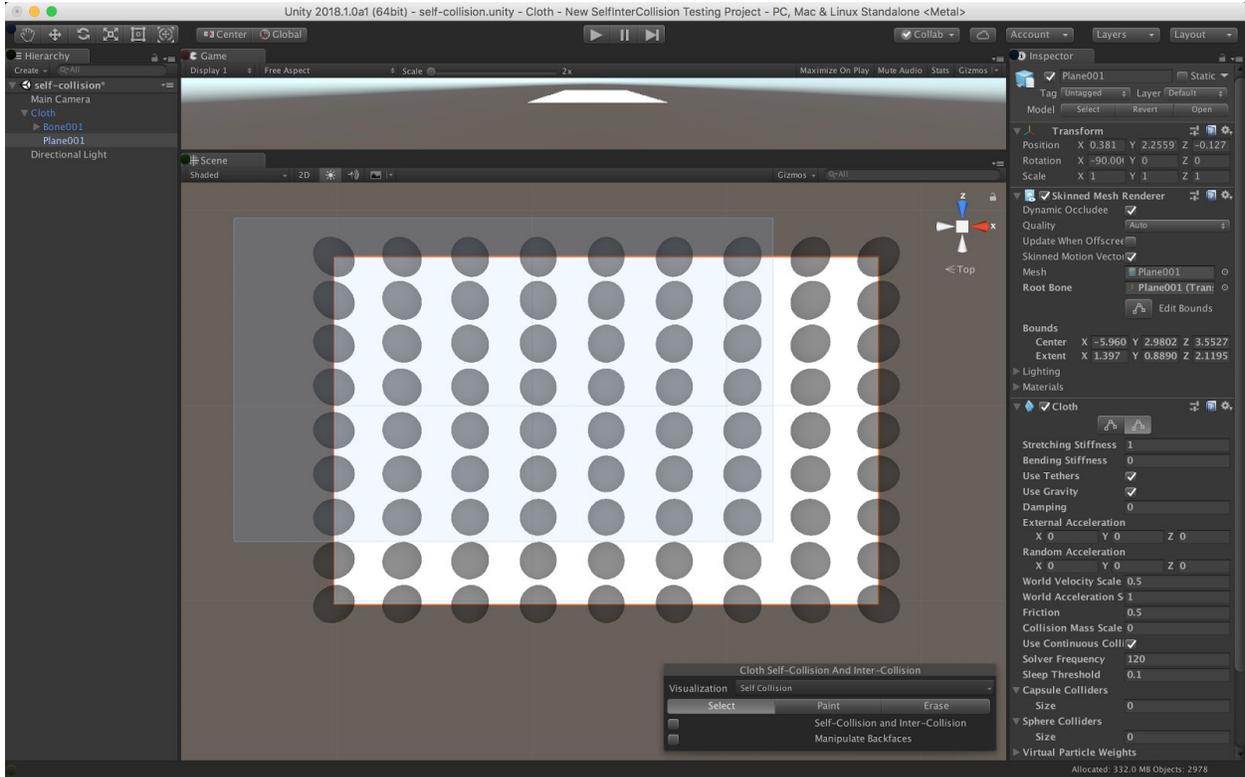




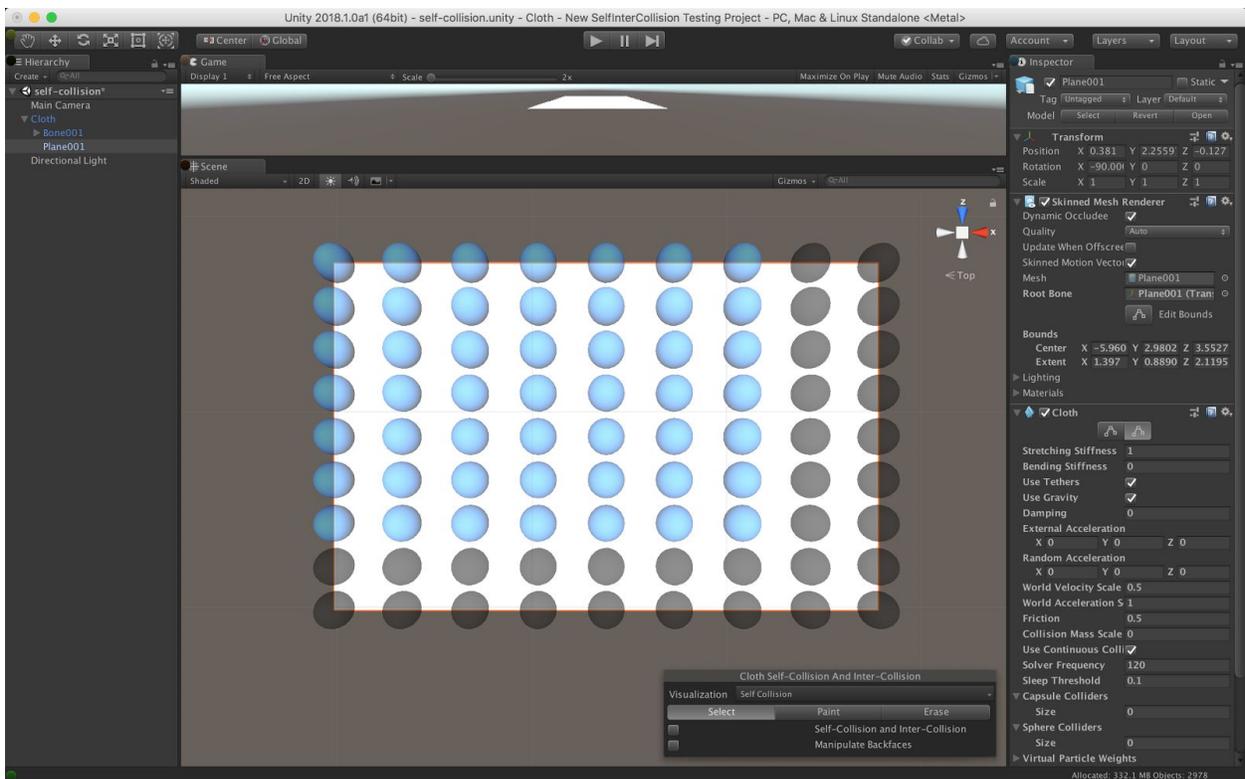
Initially no particles have been specified for use in self or inter collision. For self-collision and inter-collision one set of particles is specified which can be used for both or either. Unused particles are displayed in black.



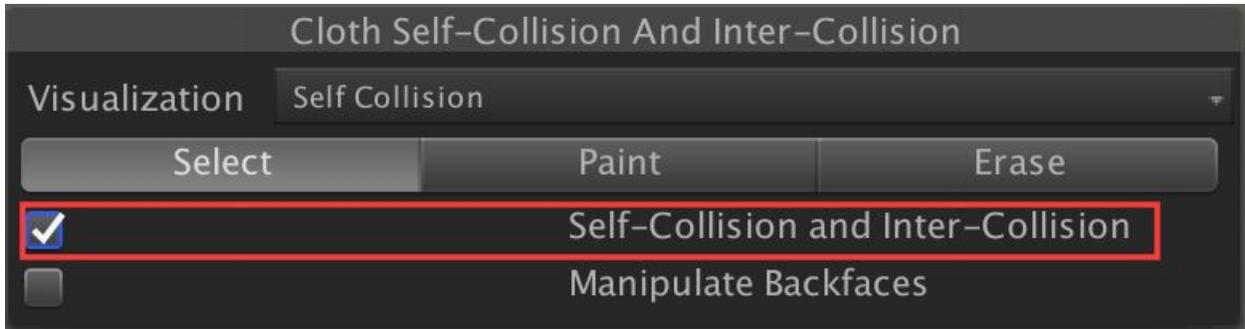
Select Mode can be used to select groups of particles for use in self or inter collision.



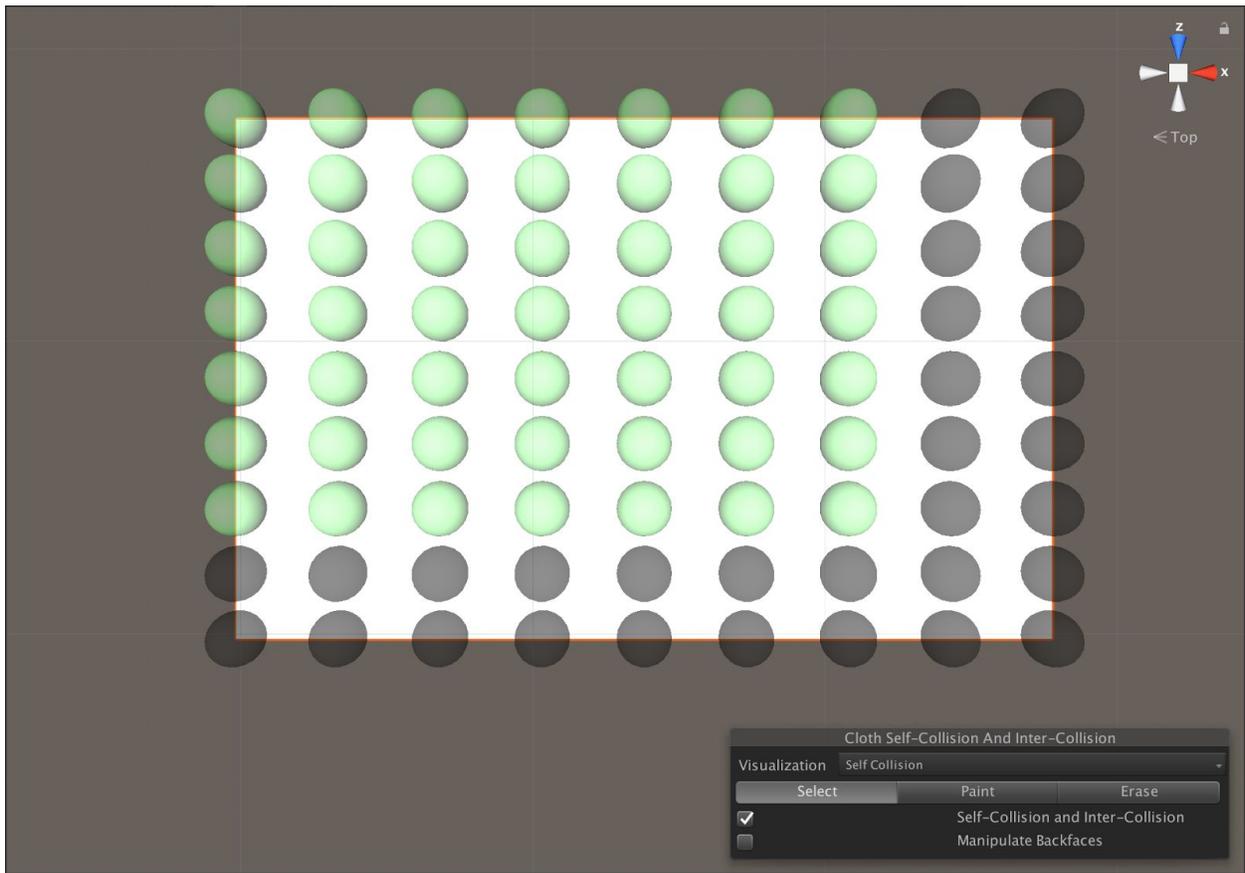
Left click and drag to select particles.



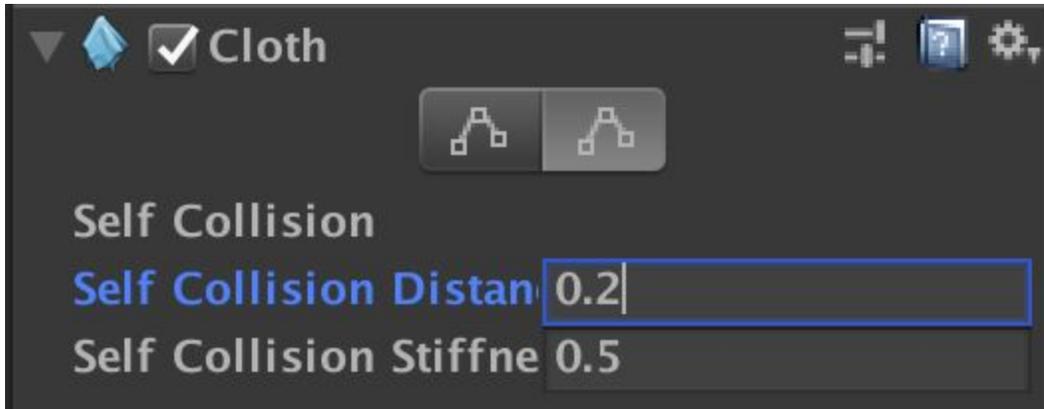
Selected particles are blue.



Click Self-Collision and Inter-Collision tick box to specify selected particles for use.



Particles specified for use in Self or Inter collision are displayed in green.

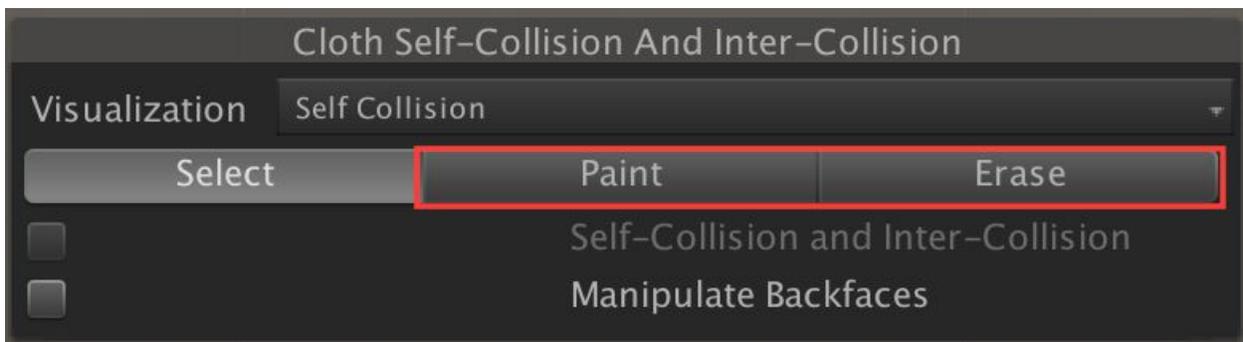


To enable self-collision behavior, one should set both self-collision distance and self-collision stiffness to non-zero values in the cloth inspector. (As seen above.)

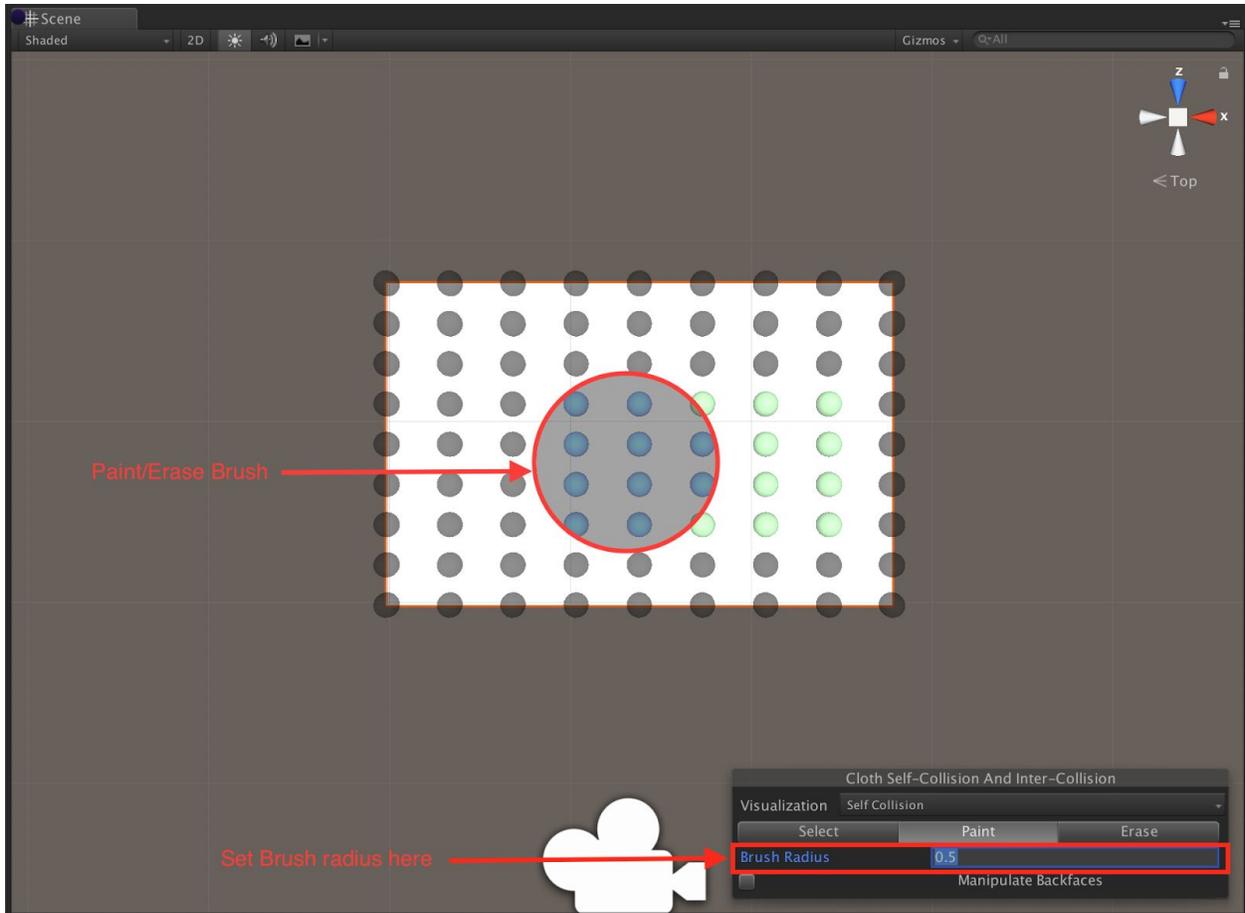
Self-collision distance defines the diameter of a sphere around each particle, and the solver ensures that these spheres do not overlap during simulations. Self-collision stiffness defines how strong the separating impulse should be.

Self-collision distance should be smaller than the smallest distance between two particles in the rest configuration. If the distance is larger, self-collision may violate some distance constraints and result in jittering.

Self collision is done based on vertices, not triangles, so don't expect self collision to work perfectly for meshes with triangles much larger than the cloth thickness.



Paint and Erase tool modes allow the user to specify/un-specify individual cloth particles for use in Self or Inter Collision.



Specified particles are green, unspecified black. Particles underneath the brush are blue.

Cloth Inter-collision

Different cloth objects can be made to collide with each other when inter-collision is enabled.

Particles can be specified for inter collision using the mechanism described above for self collision.

Just one set of particles is specified and that can be use for either/or self-collision and inter-collision.

The definition of distance and stiffness values are the same as self-collision.

The parameters for inter-collision are set for all cloth instances.

Inspector
PhysicsManager

Gravity
X 0 Y -9.81 Z 0

Default Material None (Physic Material)

Bounce Threshold 2

Sleep Threshold 0.005

Default Contact Offset 0.01

Default Solver Iterations 6

Default Solver Velocity 1

Queries Hit Backfaces

Queries Hit Triggers

Enable Adaptive Force

Contacts Generation Persistent Contact Manifolds

Auto Simulation

Auto Sync Transform

Contact Pairs Mode Default Contact Pairs

Broadphase Type Sweep And Prune Broadphase

World Bounds
Center X 0 Y 0 Z 0
Extent X 250 Y 250 Z 250

World Subdivisions 8

Layer Collision Matrix

	Default	TransparentFX	Ignore Raycast	Water	UI
Default	<input checked="" type="checkbox"/>				
TransparentFX	<input checked="" type="checkbox"/>				
Ignore Raycast	<input checked="" type="checkbox"/>				
Water	<input checked="" type="checkbox"/>				
UI	<input checked="" type="checkbox"/>				

Cloth Inter-Collision

Distance 0.4

Stiffness 0.7

Self and Inter Collision Pro-Tips

Self collision is done based on vertices, not triangles, so don't expect self collision to work perfectly for meshes with triangles much larger than the cloth thickness.

Self-collision and inter-collision can take a significant amount of the overall simulation time. Consider keeping the collision distance small and using self-collision indices to reduce the number of particles that collide with each other.

New, Improved Constraint Authoring

We have improved the constraint painting for cloth pieces by introducing a brush-based method.

