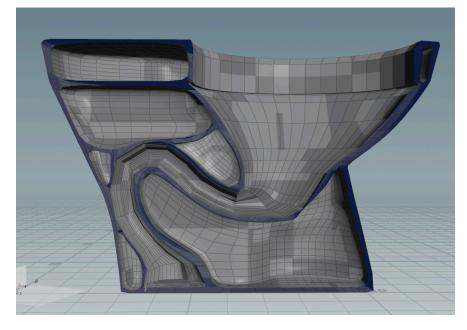
Exercise 3: Destruction | Storm Slawson Villasmil

2/18/2024 Houdini Version:19.5

Reference Videos: https://www.youtube.com/watch?v=HTPBDPUYs1s
Technical Guide | Asset

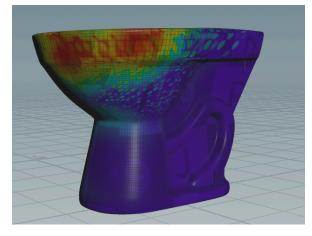
I spent the most amount of time on this project finding and preparing the toilet asset. None of the models had the interior sections of a toilet modeled, so I had to take an existing model and hollow it out so it would look good in the destruction sim.

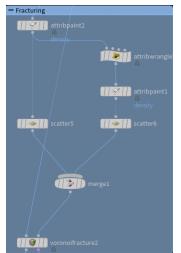


Cross section of model

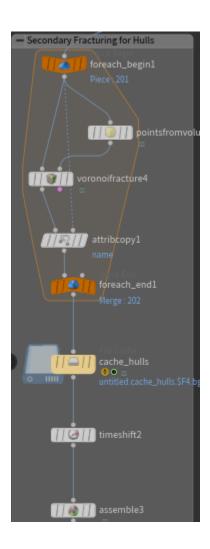
Technical Guide | Fracturing and Simulation

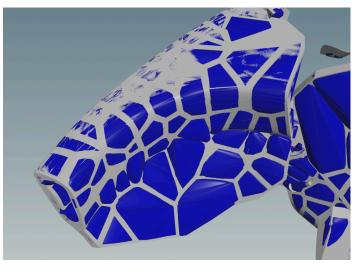
The fracturing is done by attribute painting a density attribute on the model and scattering based on that attribute. I create a secondary paint layer at a lower value which I used to create the larger fractured pieces



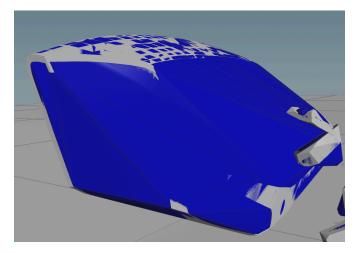


Because the larger pieces convex hull's were creating some weird interaction in the bullet solver, and also because concave is just too slow, I to created a secondary fracture that breaks up the pieces into smaller ones, in order to have more accurate collision geometry.

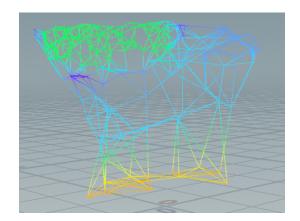




Convex hull of a larger piece with secondary fracturing

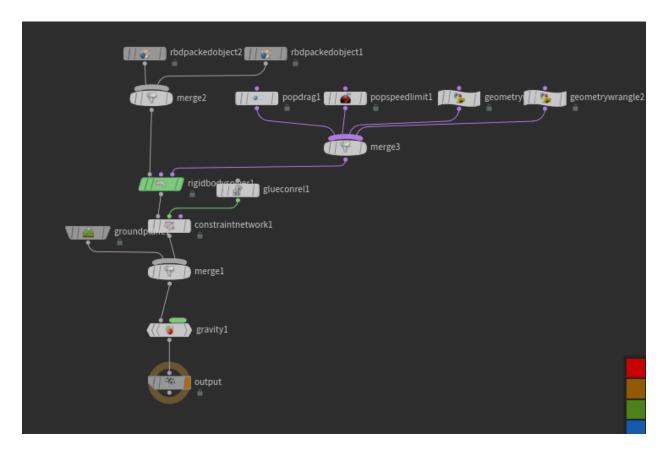


Convex hull without secondary fracturing



The constraint strength attribute is also painted

Dop Setup

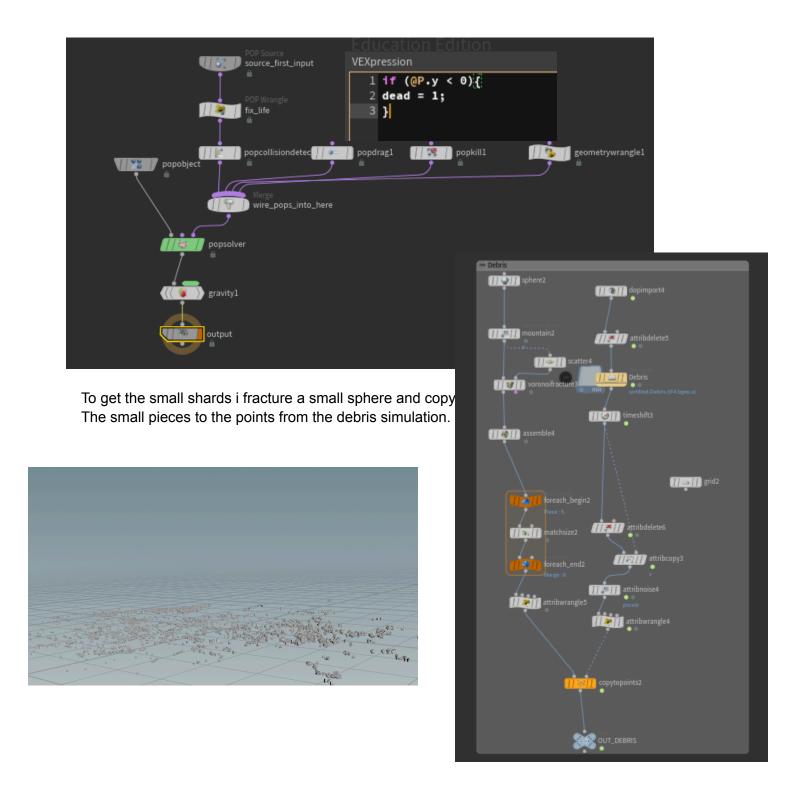


Inside of the first geometry wrangles I have a simple setup for drag and angular drag. I was running into an issue with pieces not sleeping correctly and sliding, so I wrote this expression and it fixed the issue. There is most definitely a better way to fix that problem.

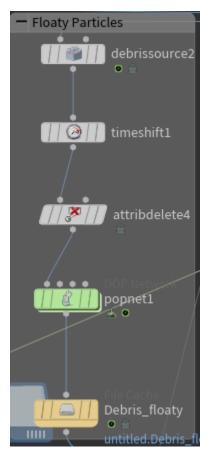


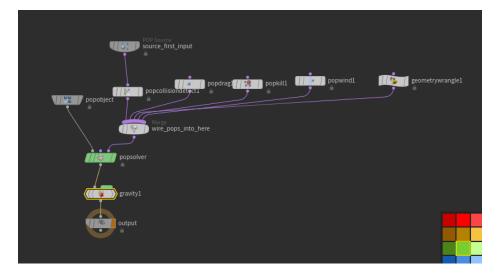
Technical Guide | Debris

POPNet of the debris simulation. The particles are sourced directly from the cached RBD sim. Inside of the geometry wrangle I have the standard drag setup. Inside of the popkill I have an expression to kill the particles that were passing through the ground plane.



For the smaller floaty debris particles I have a second simulation, where the gravity is lowered and more wind is applied.





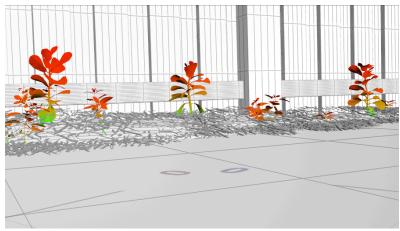
Technical Guide | Pyro

The pyro setup is done using the SOP pyro sparse solver. I source the pyro using a debris source and applying the respective attributes needed.

null3	Education Edition							
7.		🔻 🎸 Buoyancy						
debrissource3		Buoyancy Scale	0.01					
		Ambient Temp (K)	300			[-		
		Reference Temp (K)	3000			I_		
To pyrosource1		Gravity Acceleration	9.8					[-
		Gravity Direction	Θ		-1		0	
(//jःः//) attribnoisefloat1 ● =		🔻 🎸 Wind						
density		Wind Speed	.6	—I—				,
∏ I IIII attribnoisefloat2 ● ≘ temperature		Wind Direction	1		0		0	
temperature		🔻 🎸 Disturbance						
	/	Disturbance	10					[
	arta izanttributan?	Mode						
volumerasterizeattribute // Ŵ/// volumer • □ • □	asterizeattributesz	Base Block Size	0.08	 				
		Roughness	0.5			<u> </u>		
merge5	✓ vdbfrompolygons2	Pulse Length	0.2					
		Max Octaves						
pyrosolver1		Lacunarity	2.1	I				
		Threshold Field	density					
<mark>∏ ≪</mark> ∏ pyropostprocess1 ↑ ● =		Threshold Range	0.05		0			
			🖌 Use Contro	ol Field				
		Control Field	speed					
untitled.PyroTest.\$F4.bgeo.sc		Control Range	0		1			Compute Range

Technical Guide | Environment

I tried to match the environment that was in the reference. To accomplish this I gathered a lot of assets from Quixel Megascans and scattered them across the background. This includes twigs, small plants, and a fence I made.



Materials used for the scene

RS Material Builder groumd V / / I	RS Material Builder Toilet_out	RS Material Builder weighjt	RS Material Builder grass_Stuf IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	RS Material Builder fence	RS Material Builder paddle_plant
RS Material Builder particle_mat	RS Material Builder Toilet_in	RS Material Builder Volume	RS Material Builder plant I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	RS Material Builder dirtdebris	RS Material Builder metalpieces

Technical Guide | Comp

Some comp to edit the final picture

