

PARTICLE DISINTEGRATION

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04/13/2026 | Houdini Version: 21.0.440



Rendering:

Renderer: Karma XPU

Path Traced Samples: 1024

Average Render Time: 14.6 min/frame

Image Resolution: 1920x1080

Number of Lights: 1 Dome Light, 2 Spotlights, 1 Area Light

ABSTRACT

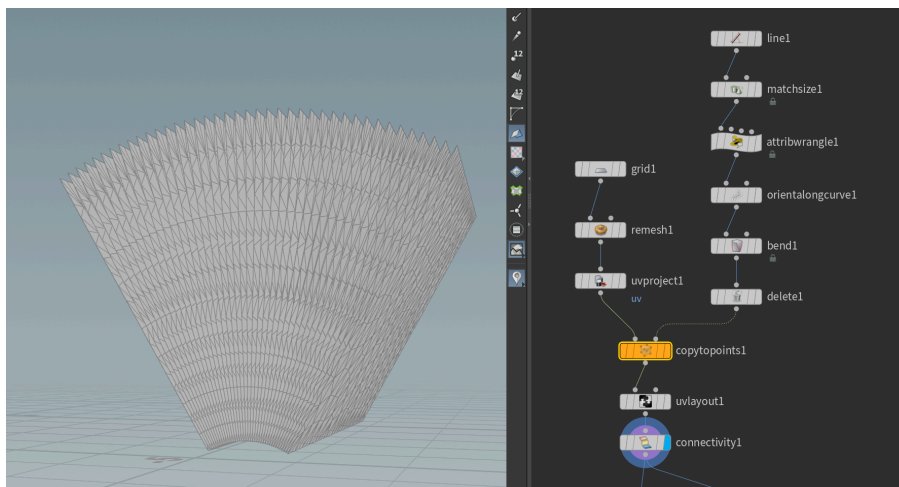
The goal of the project was to create a particle disintegration with a focus on having full control on the particle movement using VEX and Pyro Source Spread. Taking inspiration from Elsa's magic from Frozen, I chose to disintegrate a fluttering magical spellbook.



DETAILS

THE BOOK

For the initial geometry I simulated book pages with Vellum with a collision constraint of the book cover. I modeled a more detailed version of the book cover with bevels and point deformed it onto the collision geometry. Having an animated initial geometry was an added complexity that I did not initially anticipate when pitching the idea.

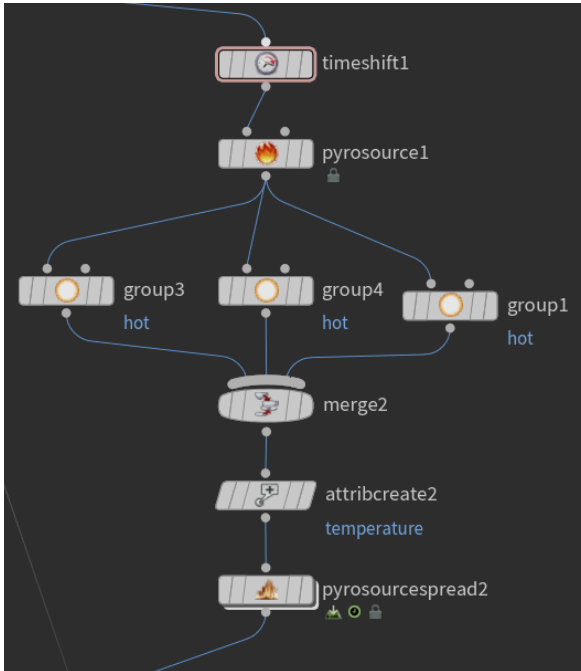


THE PARTICLES

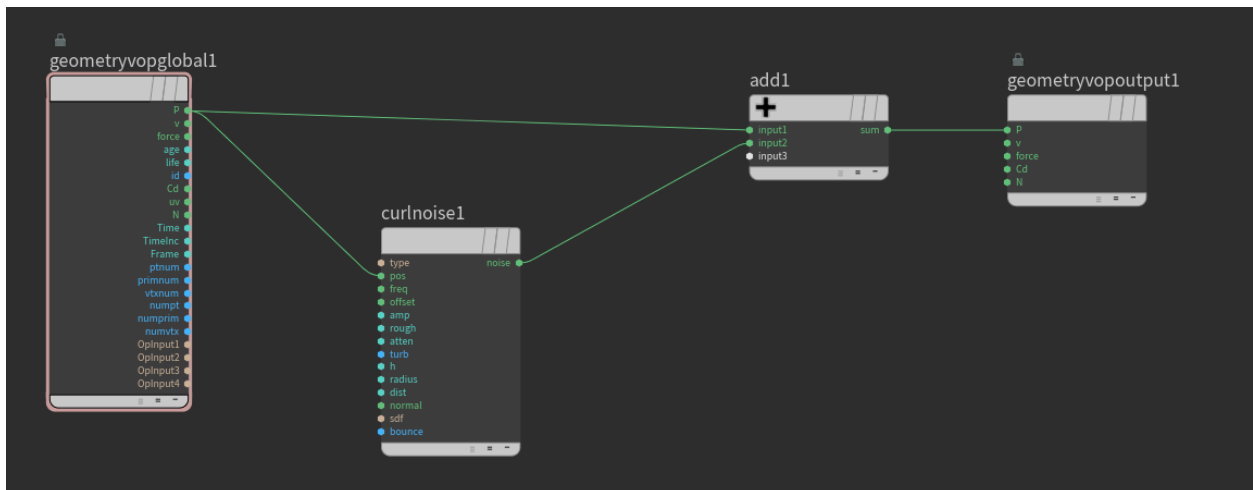
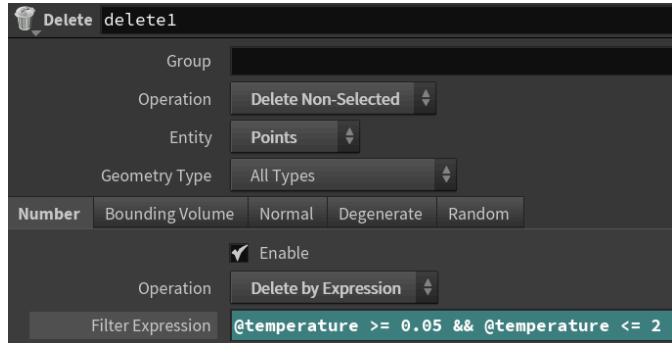
Based on my Frozen reference, I wanted two types of particles: particle trails and sparkle particles.

I used the temperature attribute in the Pyro Source Spread to create the particle scatter and source. I then deleted the particles with a range to define the source. To create the particle trails I created a VOP network, added a Curl Noise node which I then added the position, and added POP Wind.

PYRO SOURCE SPREAD



DELETE BY TEMPERATURE



VOP NETWORK

POINT DEFORM

Because my initial geometry was animated I needed to Point Deform all my simulation. This resulted in many problems.

1. If the radius of the point deform was too low, the particles seemed to be “breaking” and did not flow naturally.
2. If the radius of the point deform was too high, the particles seemed to stretch



RADIUS = 0.1



RADIUS = 1

Between the two, the stretched particles seemed to look less like a mistake so I decided I would have separate particle simulations for the left side, right side, and the book cover. This way if the particles stretched it would happen with their natural flow and would not look out of place.

POST SIMULATION

In an Attribute Wrangle I defined the relationships between the temperature, age, life and color attributes. I created a new Opacity attribute for the book and the particles so that they would seem to fade out. This code was taken from Professor Fowler’s website. I added color ramps based on the temperature so I could have subtle gradients. I randomly selected a percentage of the particles and added them to a separate group and would be the only particles with Emission. I set Velocity so that I would get motion blur on my renders. I added Pscale variation to my particles and deleted particles that were less than a certain size to optimize. I halved my USD write time in this way.

```
Attribute Wrangle disintegration_with_opacity
VEXpression
1 @pscale += 0.002 * rand(@id);
2 float index = 1-@age/@life;
3 float temp = chramp("temp", index);
4 v@Cd = set(temp, temp, temp);
5 v@opacityParticles = set(temp, temp, temp);
6 @Cd = chramp("color", index) * 10;
7 v@emit = set(0,0,0);
8 if (index > .9995)
9     v@emit = set(200*index,0,0);
```

```
Attribute Wrangle pscale_variation_with_id
Code Bindings
Group
Group Type Guess from Group
Run Over Points
VEXpression
1 //pscale_variation_with_id
2 @pscale = .002* rand(@id);
3 @pscale = fit(@nage, 0, .1, .003, .0015);
4 if (@pscale < .0016) {
5     removepoint(0, @ptnum);
6 }
```

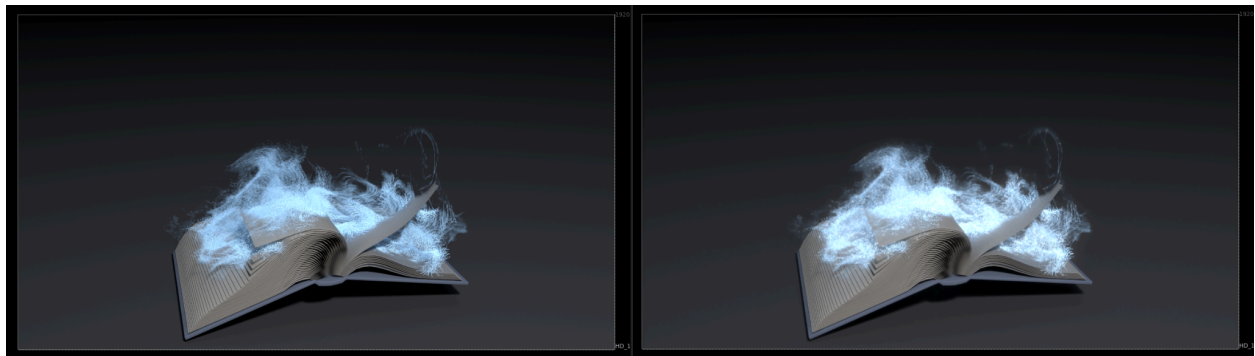
LOOK DEVELOPMENT

I connected my Color and Opacity attributes with USD Primvar Reader and Geometry Property value nodes. I added the slightest bit of Emission so that I would get an Emission AOV.



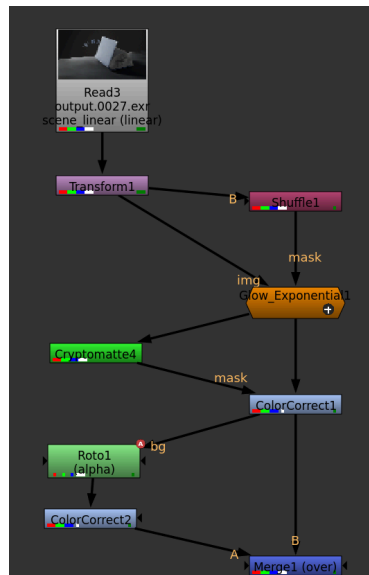
COMP

In Nuke, I shuffled out the Cryptomatte AOVs and added a very subtle glow.



PRE COMP

POST COMP



FINAL RENDERS

