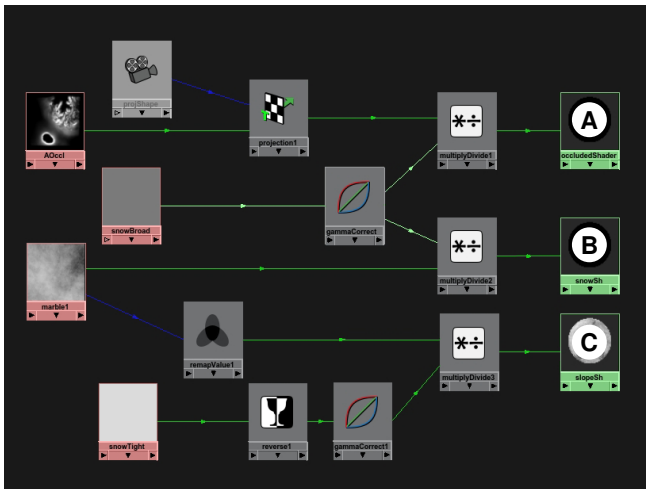
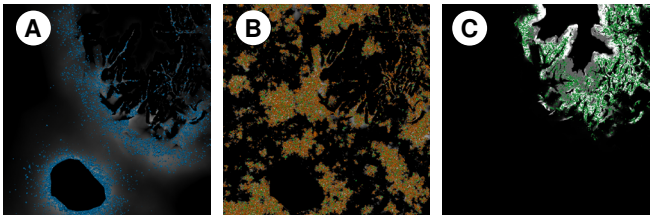
The Jungle Book: Art-Directing Procedural Scatters in Rich Environments

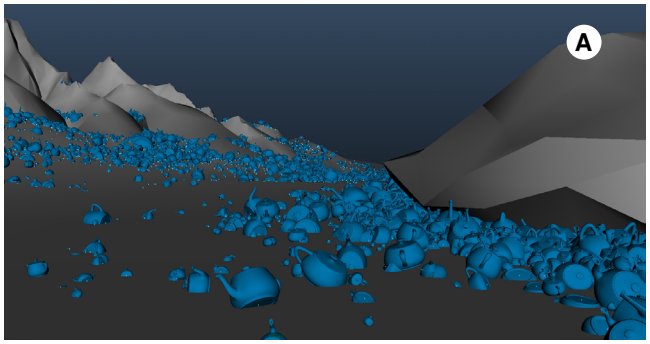
Supplementary Material



1 Maya Scattering with Shading Networks

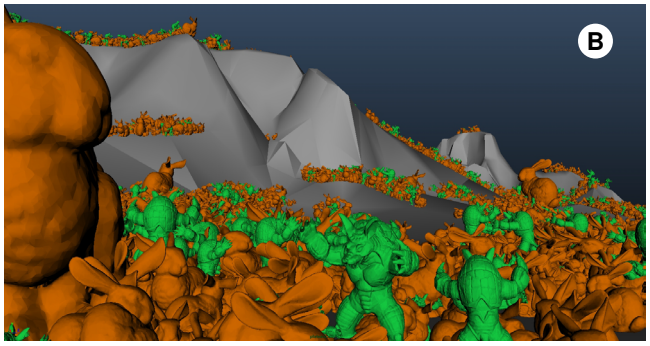
Here, the scatter results of three simple shading networks are presented, to show how the distribution rules could be achieved with native Maya nodes.
Setting up such networks was trivial for TDs, leaving most of the time for layout and look development, by tweaking the nodes' parameters in the network or expanding it with more sophisticated setups.





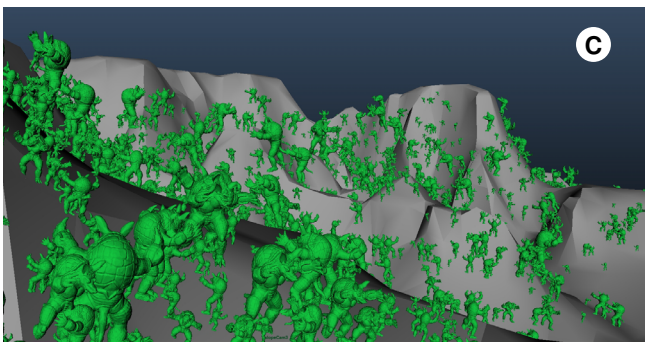
1.1 Crevices, Interstices and Gaps

Teapots tend to roll down the slopes because of their weight and forces of atmospheric agents. As a result, they normally accumulate in interstices and at the base of large objects or vertical surfaces.
Normally *Ambient Occlusion* was used to simulate this behaviour. A render was baked to an image file, to make per-particle computation faster and to easily tweak values via image editors. The image was then re-projected and multiplied by a *Snow* shader, to make sure accumulation only happened on horizontal surfaces.



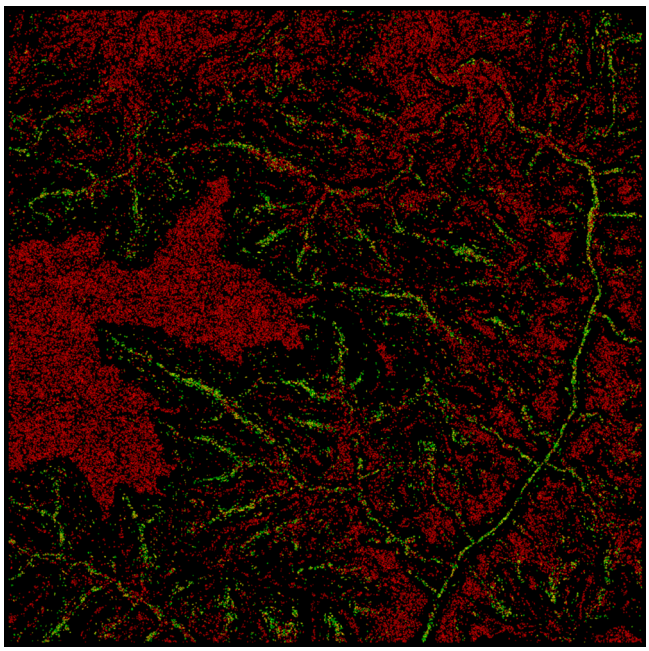
1.2 Plateaux

Patches of *Stanford Bunnies* and *Armadillos* are commonly found on planes and gentle slopes, though *Bunnies* are way more common. This type of distribution was normally achieved with Maya's *Snow* shader. Instead of just relying on the threshold and falloff parameters, artists could combine the node's output with additional patterns; in this case, it was multiplied by a high-contrast *Marble* to produce an organic patchy look. To make sure *Bunnies* appeared more frequently, their *Occurence* was set higher.



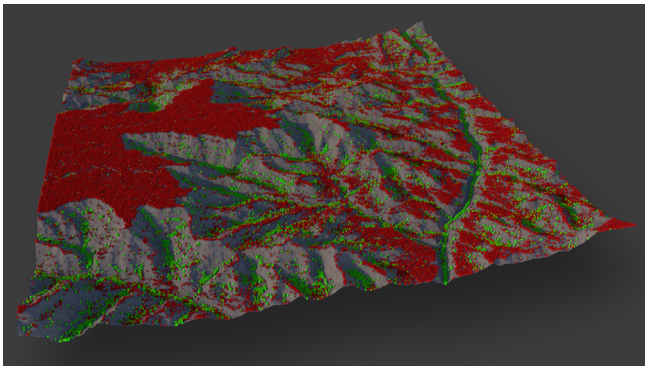
1.3 Steep Slopes

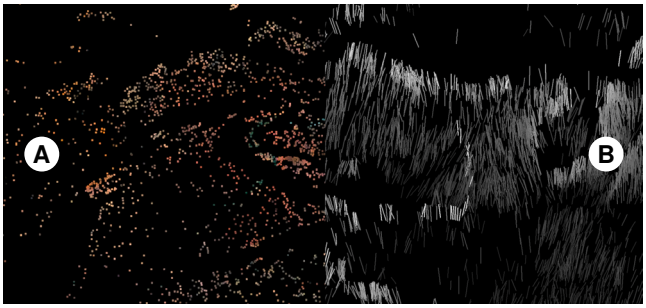
In addition to Plateaux, *Armadillos* are also found on steep slopes. Like grass, they tend to grow upward searching for sunlight.
To achieve this look, a *Reverse* node was piped after the *Snow* shader and used to drive an additional scatter setup. In this setup, the parameters for *Armadillos* were set to be affected only partially by the terrain's normal and mainly driven by the up-vector.



2 PRMan Scattering with Point Clouds

When scattering with PRMan point clouds, artists could drive the distribution behaviour via a REYES shader and its parameters. A 2D image was rendered with key colours, to preview the scatter look before launching the effective point cloud generation.
In the left image, red represents scatters on gentle slopes while green shows areas with high *Ambient Occlusion* (the same colours are used in the render below, for demonstration).





2.1 Point Cloud Attributes

When the point cloud was rendered, a set of useful attributes were stored along with the points, for future manipulation and shading. On the left, the point cloud is visualized with Pixar's *Ptviewer*, showing instances as points, coloured after the scattered terrain's texture (A) and as normals, with their *Ambient Occlusion* value (B). Displacement values could also be stored and visualized the same way.

2.2 Bent Normals

The system used PRMan to compute *Bent Normals* in addition to the standard ones (the image on the left shows a comparison between the two).
They were often used to guide instances' *Orientation*, which gave two main benefits. For tall instances it helped avoiding intersections with protruding objects and vertical surfaces in the surroundings. When scattering plants, grass or other living objects, it also helped convey that they grew searching for natural light.