



A Gallery of Mathematical Cow Shaders

CS 519 ("Shaders") Class Assignment – Spring Quarter 2007

Oregon State University
Computer Graphics

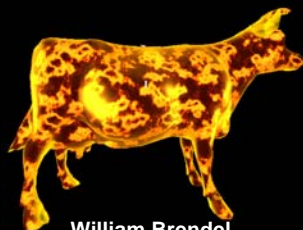


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William Brendel & Nadia Payet
Cow Wineglass

The glass cow was created by using refractive cube-mapping, with Phong lighting for the specular highlights. The "wine" was created by restricting the cow height to a certain level. The red spot in the real wine glass was mimicked in the cow glass with a noisy elliptical oval. Cheers!



William Brendel
Lava Cow

This cow is given a lava look by using a noisy black-red-yellow texture, bump-mapping on the cracks between the lava and the rocks, and a per-pixel Phong lighting model. The glow effect is from a multipass rendering to blur the silhouette, with additional lighting along the silhouette.



Benjamin Brewster
Printed Circuit Board Cow

This effect was created by displacing a pattern with a 3D noise function, with a different frequency in each of the three dimensions. With the right coloring, it looks like a printed circuit board.



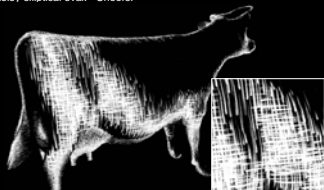
Will Dillon
Credit Cow Hologram

The "hologram" appearance was created by turning the cow's transformed XYZ normal into an RGB color, which thus changes as the object is rotated. A reflective cube map was used to make the rest of the hologram rectangle look mirrored. Don't leave the pasture without it ...



Jonathan Dodge
Stacking Cow Dolls

These cows are colored using noisy elliptical patterns. A noise function then controls the irregular edges of the cutouts in the outer two cows, revealing smaller cows inside.



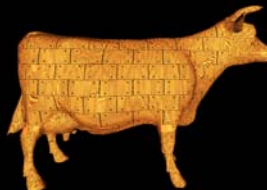
Nick Hogle
Pen & Ink Cow

This effect uses a Tonal Art Map created by hand in Photoshop. The Tonal Art Map is a series of denser and denser crosshatch patterns. Those patterns are then applied to the 3D object in lieu of lighting.



Kannan Jeyakuma
Distorted Decimated Flying Cow

This cow is distorted in 3D using a sine function and then decimated with a noise function.



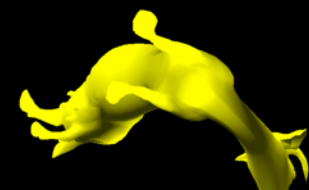
Swamy Korada
Trojan Cow

Each wood "panel" is composed of light and dark concentric cylinders perturbed with a noise function to look more irregular. The "nail holes" are added as a final pixel equation.



Jacob Lee
Multilingual Cow

The word "cow" in Arabic, Chinese, English, Hebrew, Japanese, Korean, and Taiwanese is mapped to the cow surface. The cow is making waves in a bump-mapped puddle of water.



Adam Leibel
Yoga Cow

The cow's Cartesian coordinates are converted to polar coordinates and then twisted and wrapped around different cylindrical radii.



Ray Lin
Demon Glow Cow

This cow is given its glowing appearance by using High Dynamic rendering (HDR) techniques. First, the cow image is downsized, blurred with a Gaussian filter, then blended with the original image.



Christopher Moore
Impressionist Cow

This effect uses the rendered image as a height map. It then advects the image along the edges, creating the appearance of an Impressionist painting. Claude Moo-net?



Nadia Payet
Barbed Wire

The grid of barbed wire originated as an image. Each pixel in the image produced a "normal" by looking at the intensity slope to the neighboring pixels. The cow was then textured with the image, with pixels being discarded in between the strands of wire.



Scott Proper
Bull Caricature

In this effect, a cow is geometrically morphed with two spheres. Each sphere's radius and location are separately controlled, along with a blending factor between the sphere and cow coordinates.



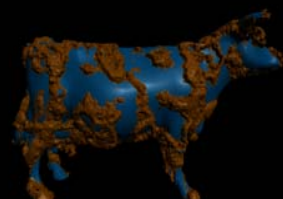
Randy Rauwendaal
ASCII Cow

In this retro effect, the cow is interactively shaded using ASCII characters, like in the old line printer plotting packages. In this case, a texture of all ASCII characters is indexed into based on the results of the lighting equation.



Ben Weiss
Cow Coming Out of Warp

This Star Trek effect is created by nonlinearly attaching and scaling the back of the cow's coordinates. The warp "star" at the end is an intensity created with a power equation based on texture coordinates:



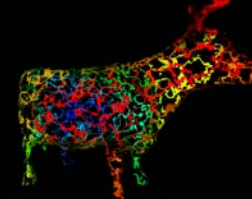
Mike Bailey
Throwing Dung

On a sphere, this looks like islands on a water planet. Unfortunately, on a cow, it looks like someone's been throwing poop. The islands start out as ovals, with a lot of noise added



Joe Graphics
Disco Cow

This cow is a refuge from the disco era. The 3D location of each pixel is compared with the 3D light source location and the 3D location of the disco ball to see how close one of the mirrored facets comes to illuminating that pixel.



Joe Graphics
Corroded ChromaDepth Cow

This cow is decimated with a noisy erosion pattern and then colored using ChromaDepth colors to give it the appearance of depth when the glasses are worn.