

Live Lecture Chat Window

March 6, 2024

13:06:22 For the bricks we were able to do the bump mapping from the normals. We get the normals from another texture that comes with the brick picture. So if we were to do this ourselves we would have to have two textures, right? One for the image and another for the normals?

That's correct. If you think of the textures as "blankets" that wrap around the object, one texture is to get the color and one is to get the normal vectors.

13:06:48 How do people generate the image for the normals of a brick?

You have to "sculpt" the small bumpy detail yourself but then modeling packages like Blender will export the normal texture map for you.

13:10:40 Why do CPUs have branch prediction and out-of-order execution but GPUs don't? It is my impression that GPUs are faster than CPUs at computing vectors because their architecture makes use of linear algebra. Whereas, CPUs are faster at arithmetic computations in general that don't require vectors.

It's not so much linear algebra, it is that GPUs have many hundreds or thousands of threads running at the same time using the same equations but on different sets of numbers. CPUs are meant to run general programs, including things that are not good at parallelism, like linked lists.

13:13:12 Quick parallax mapping question - how is it determining where on the underlying surface the line from the eye to the fragment would hit? Is it using something along the lines of the raytracing we saw in scientific visualization last week?

It is doing a crude raytracing by stepping along that ray and examining its position versus the surface. It knows to stop when it realizes it has passed the surface boundary.

13:33:58 From Bailey, Mike to Everyone: For all you *Dune* fans, here is an article about how Frank Herbert (author of *Dune*) might have been influenced by the Oregon Dunes at Florence, OR:

<https://www.bbc.com/future/article/20240229-dune-part-two-the-oregon-sands-that-inspired-frank-herberts-arrakis>

14:46:35 I have seen other students create cones in this class. I think they used an equation for the cone. Maybe something like that can help with the volcano?

We have created an `OsuCone()` function you can use if you need it.

14:47:43 From Bailey, Mike to Everyone: [the notes we use for our summer high school Blender Camp]

<http://cs.oregonstate.edu/~mjb/blender>