

Catia by Dassault Systems

What we are showing here today at SIGGRAPH is the power of Catia, powered by NVIDIA RTX. We're showing a tech preview of the rendering technologies we're supporting on the 3DEXPERIENCE platform.

So what we have here is a very large data set of an entire vehicle. This is not prepared data. This is all engineering data. It's around 1GB of data -- it's 10,00 parts and over 20 million polygons. What we're doing is leveraging the NVIDIA technologies to offer a couple of different rendering styles. What you're going to see where, when we zoom in -- while we're rotating around, you can see that we're going to go to a rasterized rendering mode. We're using OpenGL technologies here. But when we let go of the mouse, what we're going to do is Catia is going to make a very smooth transition over to a physics-based render.

Currently, the machine that we're running is hooked up to a really wonderful RTX server running about, I believe it's eight RTX6000 cards.

Engineers are going to have the ability to get a much more relevant feel -- look and feel for what they're designing very early on. We're bringing the high-quality visualization and all of the best capabilities right to the designers who are working on this data.

We have the capability to pass a cutting plane through [the vehicle]. We like to show this because this is a good indication that this is *real* data. So if I'm going to cut this vehicle in half, just a little bit here. Then we'll zoom up, and you can see that we can see right inside the engine compartment. We can continue to pass the cutting plane straight through the vehicle. This is a phenomenal capability to have for doing design explorations.

Now another thing that we are showing is that we're getting a very high correlation which what this would actually look like.

We're bringing in global illumination and we're calculating all of the actual light bounces in here. So we can check for reflections. We can do things like check glare off of the inside of the windshield -- we call those veiling glare reflection studies. And you can see that transition takes place, usually, most evidently, if you're looking in the rearview mirror. You can see that while the vehicle right here looks very photorealistic, because we're in OpenGL mode, we don't necessarily have a good correlation with reality because these are not highly accurate calculations of the light bounce. But when I let go, you can see that in the side view mirror, we'll see that actual reflections take place.

One of the things we're showing today is we have an actual swatch of material -- we're working with XRITE, which is one the pre-eminent material scanning companies. And what they'll do is they've got a TAC7 scanner which will scan your material using multitudes of cameras, and under various lighting conditions, to get a highly accurate representation of the coloration and the variation of that material from all angles. What that does is it offers designers a very high correlation with what they see on screen with that those materials will actually look like in reality.

This seat bolster was done with an XRITE AXF material -- it's a new standard that they are coming out with. We are [also] working with Algorithmic and Substance materials, so we support those technologies as well.

In order to have a workflow like this, without the kind of power that we get from the NVIDIA GPUs -- we really couldn't do work like this. It wouldn't be possible. It's really accelerated our ability to bring a lot better functionality to our customers. So it's been a real boon for everything that we are working on.