

What's next for 3D Graphics? - Physically Based Rendering

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ABSTRACT

Traditional graphics rendering such as that used by OpenGL or DirectX uses rasterization, creating an approximate 3D model of the world using polygons which are filled with textures and or programmable shaders. Advances in GPU technology such as Global illumination, real-time physics models and compute shaders are vastly improving the realism of scenes being updated at 60fps.

This paper looks at what technologies are needed to create photo realistic scenes updated at the all important 60fps. Photo realism has been achieved for years in Movies, Special effects and Product design by using ray-tracing where a computer simulation of the light sources in a scene are used to create the image captured by the eye or camera.

Physically Based Rendering is the next step to generate real-time photo-realistic scenes. We provide an introduction to this technology and show how performance scales across multiple nodes of a cluster to achieve 60fps. Additionally Physically Based Rendering also offers significant time saving in authoring content and scenes, since photo-realism is achieved simply by assigning materials as opposed to optimising artistic, look and feel. We speculate on how improvements in GPU technology could result in being a core component to the rendering engine of an Image Generator with the next decade.

BIO

Doug Traill is a Senior Solutions Architect at NVIDIA responsible for Scalable Visualization Technologies. In this role he works with System Integrators, developers and end customers to help design and implement complex visualization systems. Prior to NVIDIA he worked for 9 years at Silicon Graphics in various technical roles including Solutions Architect and Visualization product manager. During his career Doug has helped design and build some of the World's largest Visualization Centers. He holds a Bachelor of Engineering degree in Electronic Systems and Microprocessor Engineering from University of Glasgow (UK) as well as a Masters of Telecommunications Business Management from Kings College London (UK).