

What Makes a Production Renderer in 2016

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Abstract

Even a casual search turns up many renderers that call themselves “production renderer”—some of them relatively unknown, others known to be of very high standard. In addition to these sources, many of the large studios have their own renderers, investing significantly into the resources required to develop this technology. This panel explores the reasons that this is the case, and what it means to call a product “production-ready”.

Keywords: rendering, animation, film production

Concepts: • Computing methodologies ~ Computer Graphics;

1 Introduction

Putting a renderer into production, and maintaining it once it is there, is a daunting task both technically and nontechnically. This is significantly due to the relative infancy of renderer technology (even basic renderer architecture has undergone sweeping changes in the past decade) and partially due to the weight studios put on technological and creative control.

This panel brings together those working at the forefront of this industry — architects of both leading-edge products just a few years old and those with more than two decades of proven performance — to discuss the issues in renderer development and acceptance. Combining experts from the major studios that develop this technology with their counterparts on the commercial renderer side, the panel aims to offer an in-depth look at what it takes for a renderer be used in full production.

We will examine the technical and nontechnical issues involved in introducing a renderer into the contemporary production environment, and maintaining it beyond. Topics include: deciding which capabilities are absolutely necessary (and which are not); the importance of technological and creative control; team size and composition; how utilization of open-source components has

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changed development; and addressing the potential disruption of new research results on the development process.

2 Panel Format

This is a moderated panel, with each participant given a few minutes to describe their product and its environment, either studio or commercial. Following, the moderator will ask a set of questions covering the topics mentioned above, either directly to individual panelists as per their experience, or as open questions to the group for discussion. There will be 15 minutes devoted to audience Q&A.

3 Participants

Brent Burley is a Principal Software Engineer at Walt Disney Animation Studios working on production rendering software. In addition to creating Ptex and the Disney BRDF, he leads the development of Disney's Hyperion Renderer.

Marcos Fajardo is the founder and CEO of Madrid and London-based Solid Angle, where he leads the research and development team working on the Arnold path tracing renderer. Previously he was a visiting software architect at Sony Pictures Imageworks, a visiting researcher at USC Institute for Creative Technologies under the supervision of Dr. Paul Debevec, and a software consultant at various CG studios around the world. He studied Computer Science at University of Málaga, Spain. Marcos is a frequent speaker at SIGGRAPH, FMX and EGSR. His favorite sushi is engawa.

Alexander Keller is a director of research at NVIDIA, leading advanced rendering research. Before, he had been the Chief Scientist of Mental Images, where he had been responsible for research and the conception of future products and strategies including the design of the NVIDIA Iray renderer. Prior to industry, he worked as a full professor for computer graphics and scientific computing at Ulm University, where he co-founded the UZWR (Ulmer Zentrum für wissenschaftliches Rechnen) and received an award for excellence in teaching. Alexander holds a PhD in computer science, authored more than 27 granted patents, and published more than 50 papers mainly in the area of quasi-Monte Carlo methods and photorealistic image synthesis using ray tracing.

Philippe Leprince is a Senior RenderMan Field Engineer at Pixar Animation Studios. He started his career at the end of 80's in France where he worked for Deus, Ex-Machina, Duboi, and Mikros Image, among others. Frustrated by the tools of the day,

he learned by himself how to develop his own 3D and 2D tools. In 2003, he joined Framestore to work on Harry Potter and The Prisoner of Azkaban as a R&D TD in charge of motion-control and later shader writing. In 2007, he was hired by Double Negative where he received a VES Award for The Dark Knight in 2008. Shortly after Inception, he became Head of Lighting and Rendering and transitioned Double Negative to physically based rendering. Philippe joined Pixar in 2014.

Michael Reed is a Senior Research Associate in the R&D group at Blue Sky Studios, where he works on geometry-related functionality in Blue Sky's renderer *CGIStudio*. He received his Ph.D. in Computer Science from Columbia, his BS in Physics from the State University of New York at Albany, and has held appointments at the research laboratories of IBM, Philips, and Bell Atlantic corporations.

Maurice van Swaaij is manager of the R&D department at Blue Sky Studios. After starting his career in CG at TDI in Paris, he joined Blue Sky in 1994 where he developed a voxel based ray-tracing technology for rendering hair for the first Ice Age movie. Subsequently the technology has been used to render fur, feathers, foliage, flowers, grass, saw dust, snow and crowds of characters among other things. He received his Software Engineering degree in the Netherlands and a Masters in Scientific Computing from Courant Institute in New York. He lives with his wife and adopted dog in Fort Greene, Brooklyn.

Eric Tabellion is a rendering principal engineer in the R&D group at DreamWorks Animation, where he has been working on film production rendering since 1999. Eric's work has been primarily focused on practical global illumination using irradiance caching, raytracing, physically-based and point-based approaches. Eric also worked on various aspects of computer graphics, such as rendering shadows, realistic reflections and refractions, efficient post-process motion-blur and depth of-field algorithms, fluid surface reconstruction techniques, as well as particle and crowd simulation systems. Eric was awarded a Technical Achievement Academy Award in 2010 for his work on global illumination. He graduated with a Masters in computer science from the Université de Marne-la-Vallée in 1996. Eric's movie credits include all DreamWorks animated films from "Shrek" to date.