New algorithm to improve video game quality

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Research presented in a paper by Morgan McGuire, assistant professor of computer science at Williams College, and co-author Dr. David Luebke of NVIDIA, introduces a new algorithm to improve computer graphics for video games.

McGuire and Luebke have developed a new method for computerizing lighting and light sources that will allow video game graphics to approach film quality.

Their paper "Hardware-Accelerated Global Illumination by Image Space Photon Mapping" won a Best Paper award at the 2009 Conference on High Performance Graphics.

Because video games must compute images more quickly than movies, video game developers have struggled with maximizing graphic quality.

Producing light effects involves essentially pushing light into the 3D world and pulling it back to the pixels of the final image. The method created by McGuire and Luebke reverses the process so that light is pulled onto the world and pushed into the image, which is a faster process.

As video games continue to increase the degree of interactivity, graphics processors are expected to become 500 times faster than they are now. McGuire and Luebke's algorithm is well suited to the quickened processing speed, and is expected to be featured in video games within the next two years.

McGuire is author of "Creating Games: Mechanics, Content, and Technology" and is co-chair of the ACM SIGGRAPH Symposium on Non-Photorealistic Animation and Rendering, and previously chaired the ACM Symposium on Interactive 3D Graphics and Games.

He has worked on and consulted for commercial video games such as "Marvel Ultimate Alliance" (2009), "Titan Quest" (2006), and "ROBLOX" (2005).

Provided by Williams College