

# Digital Photography in Realistic Computer Graphics

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## Abstract

Despite of many years' researches, better and better graphics hardware, tremendous improvement of graphics algorithms, pictures generated by computers are still far from being perfect. We've been trying to synthesize realistic visual effects for many years but, to be quite honest, achieving photo-realism will not be possible very soon. Plenoptic function, which describes the color of any point in 3D, watching at any direction, in any range of light frequency, and in any time moment is too complex (please notice its 7-dimensions) and we don't know how to approximate it accurately. The best known approximation of plenoptic function is a classic photography. So why not to use photos in computer graphics. Taking photographs is a quite easy task, acquisition devices are technology developed and popular, storing is very efficient. Photographs can be used as a textures and environment maps in real time graphics systems. They can store information about light propagation and be used in global illumination algorithms. Recently, the latest constrain of photographs usage - limited dynamic range - seems to be overcome due to HDR (High Dynamic Range) images. HDR photos enables to light up the artificial imaginary in the most natural way. Thanks to photography, realistic visualization can be achieved based on relatively simple computation rather than complex global illumination models. An intention of the talk is to present various possibilities of using photographs in computer graphics. Especially, HDR images abilities are going to be discussed.