

Overcoming Physical Limitations of Display Devices in Rendering

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ABSTRACT

The knowledge of human visual system (HVS) enables more efficient image rendering by overcoming physical constraints of display devices. This talk presents a number of successful examples of embedding HVS models into real-time rendering pipelines. In particular, I discuss the problem of improving the appearance of highlights and light sources by boosting their apparent brightness using the temporal glare technique. Also, I discuss how to overcome physical contrast limitations of display devices by using the 3D unsharp masking technique to boost the apparent contrast. Also, I present techniques for apparent resolution enhancement, which enable showing image details beyond the physical pixel resolution of the display device. Finally, I discuss the role of perception in context of stereovision and accommodation/vergence conflict reduction

BRIEF BIOGRAPHY

Karol Myszkowski is a tenured senior researcher at the MPI Informatik, Saarbruecken, Germany. In the period from 1993 till 2000 he served as an associate professor in the Department of Computer Software at the University of Aizu, Japan. In the period from 1986 till 1992 he worked for Integra, Inc. a Japan-based, company specialized in developing rendering and global illumination software. He received his PhD (1991) and habilitation (2001) degrees in computer science from Warsaw University of Technology (Poland). In 2011 he was awarded with a lifetime professor title by the President of Poland. His research interests include perception issues in graphics, high dynamic range imaging, global illumination and rendering. Karol published and lectured on these topics widely including ACM Siggraph/Siggraph Asia Courses in 2001, 2002, 2004, 2006, and 2012. He also co-chaired Rendering Symposium in 2001, ACM Symposium on Applied Perception in Graphics and Visualization in 2008, Spring Conference on Computer Graphics 2008, and Graphicon 2012