

UNIVERSITY OF MACAU
FACULTY OF SCIENCE AND TECHNOLOGY
DEPARTMENT of
COMPUTER AND INFORMATION SCIENCE

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*"Lighting Simulation of Augmented Outdoor
Scene Based on a Single Image"*

by

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Abstract

We propose a novel approach to simulate the illumination of augmented outdoor scene based on a single image. Unlike previous works, we adopt the technique of PRT to represent the complex illumination of outdoor scenes with a few simple parameters. The illumination is solved by a procedural refinement approach following the more and more accurate estimation of the material parameters. Our method creates a high quality environment map producing wonderful rendering results. We also explore the problem of shadow casting between real and virtual objects. An efficient method is proposed to project complex shadows (such as

tree's shadows) on the ground of the real scene to the surface of the virtual object with texture mapping. Finally, we present a unified scheme for image composition of a real outdoor scene with virtual objects ensuring their illumination consistency and shadow consistency. The experiments demonstrate the effectiveness and flexibility of our method.

Biography

Prof. Qunsheng Peng is currently a professor in State Key Lab of CAD&CG, Zhejiang University. He graduated from Beijing Mechanical College in 1970 and received a Ph.D from the Department of Computing Studies, University of East Anglia, UK in 1983. His research interests include realistic image synthesis, virtual reality, bio-molecule graphics and scientific visualization. In these fields, he has authored and coauthored more than two hundred journal and conference papers, including ACM SIGGRAPH, ACM VRST, ICCV, Eurographics, Pacific Graphics, etc. He received Computer Graphics Achievements Award of China at Chinagraph'2000. He is a member of the editorial board of The Visual Computer, Journal of Computer Science and Technology and several Chinese journals.

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