EFFICIENT RENDERING OF RADIAL BASIS FUNCTION FOR ILLUMINATION ADJUSTABLE IMAGE

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Abstract

An illumination adjustable image (IAI) contains a large number of pre-recorded reference images under various lighting directions. It describes the appearance of a scene illuminated under various lighting directions. Relighting of a scene under complicated lighting conditions can be generated from the IAI. Using the radial basis function (RBF) approach to represent an IAI is proven to be more efficient than using the spherical harmonic approach. This thesis investigates two practical issues of using the RBF approach for relighting an IAI under various lighting configurations. Firstly, a partial reconstruction scheme for relighting a scene under local light sources is presented, which is facilitated by the locality of RBF basis functions. Compared with the conventional approach, the proposed scheme offers the similar distortion performance but it has a much faster rendering speed. The implementations of rendering directional light source, point light source and slide projector are presented. Secondly, a direct projection method for environment relighting of a scene is presented which supports not only static environment rotation but also time-varying environment.
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