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Fast GPU-based reuse of paths in radiosity

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We present in this paper a GPU-based strategy that allows a fast reuse of paths in the context of shooting random walk applied to radiosity. Given an environment with diffuse surfaces, we aim at computing a basis of n radiosity solutions, corresponding to n light-source positions. Thanks to the reuse, paths originated at each of the positions are used to also dis-tribute power from every other position. The visibility computations needed to make possible the reuse of paths are drastically accelerated using graphic hardware, resulting in a theoret-ical speed-up factor of n with regard to the computation of the independent solutions. Our contribution has application to the fields of interior design, animation, and videogames.

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