

Title: A Virtual Restoration Stage for Real-World Objects

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Abstract

In this paper, we introduce a system to virtually restore damaged or historically significant objects without needing to physically change the object in any way. Our work addresses both creating a restored synthetic version of the object as viewed from a camera and projecting the necessary light, using digital projectors, to give the illusion of the object being restored. The restoration algorithm uses an energy minimization method to enforce a set of criteria over the surface of the object and provides an interactive tool to the user which can compute a restoration in a few minutes. The visual compensation method develops a formulation that is particularly concerned with obtaining bright compensations under a specified maximum amount of light. The bound on the amount of light is of crucial importance when viewing and restoring old and potentially fragile objects. Finally, we demonstrate our system by restoring several deteriorated and old objects enabling the observer to view the original or restored object at will.