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Quick Viewpoint Switching for Manipulating Virtual Objects in Hand-Held Augmented Reality using Stored Snapshots

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Abstract: Magic-lens style augmented reality applications allow users to control camera pose easily by manipulating a portable hand-held device and provide immediate visual feedback. However, strategic vantage points must often be revisited repeatedly, adding time and error and taxing memory. We describe a new approach that allows users to take snapshots of augmented scenes that can be virtually revisited at later times. The system stores still images of scenes along with camera poses, so that augmentations remain dynamic and interactive. Users can manipulate virtual objects while viewing snapshots, instead of moving to real-world views.

We present a study comparing performance in snapshot and live mode conditions in a task in which a virtual object must be aligned with two pairs of physical objects. Proper alignment requires sequentially visiting two viewpoints. Participants completed the alignment task significantly faster and more accurately using snapshots than when using the live mode. Moreover, participants preferred manipulating virtual objects using snapshots to the live mode.

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[Brief movie showing highlights from interaction method and user study \(40059 Kb\)](#)

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