Dynamic Augmented Reality X-Ray on Google Glass

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(a) (b) (c) (d)

Figure 1: *In our demonstration users A and B are separated by a wall, both wearing a Google Glass. User A views a point of interest, currently only visible to user B ((a) and (b)). User A's view is augmented with video streamed from user B when the target is partially (c) or fully (d) occluded. (Note: (c) and (d) contain simulated augmentations)*

Keywords: Augmented Reality, X-Ray visualization, Google Glass

Motivation Over the recent years, research in sophisticated Augmented Reality (AR) X-Ray visualization techniques such as [Dey and Sandor 2014] that permit the user to see through real-world objects have created the possibility for mobile applications to show occluded information in an innovative and intuitive fashion. A popular application is navigation assistance in inner city environments. We think that Google Glass, a hands-free, wearable mobile device, which allows immediate access to web services, is a promising platform for such X-Ray systems.

Demonstration In this demonstration we show an AR X-Ray system that involves two Google Glass users (see Figure 1). One glass is used to stream images and pose data to the other glass, which uses this information for X-Ray visualization. Similar to [Barnum et al. 2009] we use a live camera video feed; however, we enable the streaming user to move freely.

Contribution The system developed by [Sandor et al. 2010] utilizes a static image as source data for the occluded area. [Barnum et al. 2009] use a stationary camera viewing the occluded area to provide a live view. Our system is the first to implement both a live video feed and a moving camera for a view of the occluded area.

Audience The intended audience of our demonstration is anybody who is interested in AR applications on Google Glass that use innovative visualization techniques. By enabling attendees to experience X-Ray AR we hope to trigger interesting discussions about mainstream applications of this technology.

We will show a virtual reality representation of the scene, as well as a live video feed of the X-Ray view on a separate PC, so spectators can get an immediate understanding of the demonstration.

Future Work Our prototype demonstrates AR X-Ray for near-field occluded points of interest (POI). This function already has many uses when exploring a city. However, in order to additionally explore farther medium- to far-field occluded POIs a contextual aid, akin to Bell et. al's transitional World in Miniature [Bell et al. 2002], is required and we will implement it in future work.

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