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# Augmented Reality Photography Assistant

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## **Augmented Reality Photography Assistant**

### **Abstract:**

An augmented reality photography assistant or a virtual reality photography assisted mode allows a photographer to compose a particular shot and save the settings for that particular shot. The settings can include more than just typical camera settings like white balance, aperture, shutter speed, and ISO settings. The saved settings can also include positions of objects or persons within the particular shot, orientation of the camera itself, or physical location of the camera. The photographer can pass the camera or the saved settings to another person to take the particular shot. In a viewfinder or other shot-framing device of a camera featuring a virtual reality or augmented reality environment, the other person may see a series of guidelines or other positioning guides that allow the other person to compose the shot as the photographer envisioned. Alternatively, the photographer could save or receive the necessary settings and replicate a photo taken previously or recreate a photo taken by another photographer.

### **Keywords:**

Photograph, photo, camera, photographer, guide, arrangement, orientation, position, pose, assist, compass, visual positioning system, view, viewpoint, view finder, landmark, virtual reality, augmented reality.

### **Background:**

When taking a group photo or video, the photographer can be left out. Although self-portraits (selfies), timers, remote triggers, assistants, and other devices allow the photographer to be in the photo, these alternative methods of taking a photo can be quite limiting. For example, a self-portrait or selfie is often limited to the arm length of the photographer, which may not allow for all members of the group to be in the photo. Timers and remote triggers require the

photographer to place the camera in a stable position, which may require additional support devices like a tripod or jeopardize the camera itself. Once separated from the camera, the photographer depends on a timer, which is likely already running, or a remote trigger. When joining the group, the photographer waits for the timer or manually triggers the photo. However, many cameras feature automatic modes that could adjust the composition of the photo or camera setting based on the introduction of the photographer him or herself. Further, the photographer may have difficulty arranging and orienting the camera and keeping the camera in the correct position or at the desired settings without actively holding the camera.

Alternatively, the photographer could pass the camera to another person and provide instruction as to how to compose the desired photo. The instruction and vision provided by the photographer may not match the instruction or vision received by the other person. The other person may also not be familiar with the camera model, buttons, functions, and settings. In such circumstances, all the photographer can do is “hope” that the camera or the other person takes the picture envisioned.

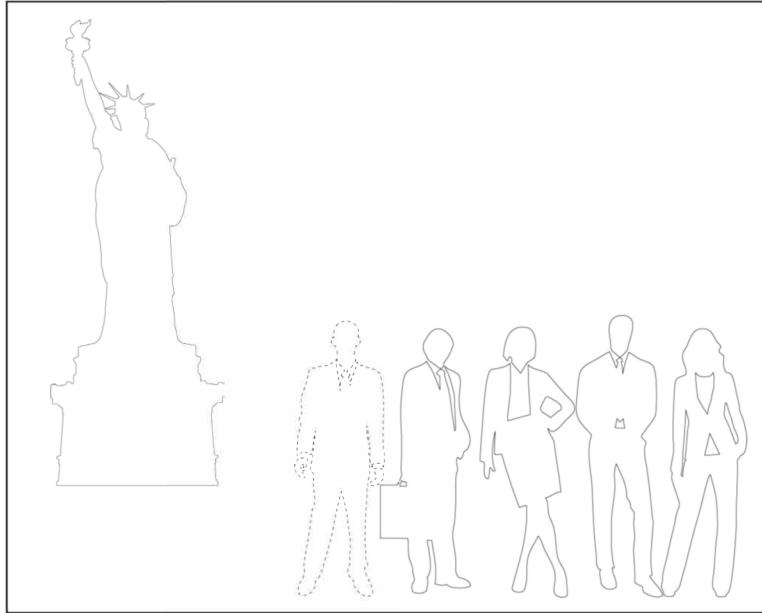
A similar challenge faces a photographer attempting to recreate a photo taken at a previous time or taken by another photographer. For example, some groups or individuals take the same photo at intervals to show changes over time, such as a child’s photo taken on each successive birthday, changes to a city skyline, changes at a location among different seasons, or the effects of changing climate. Additionally, many photographers like to replicate pictures taken by others. For example, a traveler visiting a famous location like the Taj Mahal or the Eiffel Tower may want to replicate a particular sample photo taken by another or a photo considered to be iconic or a “must-take” at the location. Particularly for amateur photographers, replicating a photo can be very complicated and frustrating.

Thus, a photographer may desire a photography assistant or photography assisted-mode that can aid taking group photos that include the photographer or help the photographer recreate a photo taken previously or taken by another photographer. The systems, sensors, components, and capacities of a virtual reality or augmented reality system can aid a photographer in staging and capturing a desired photo or video.

**Description:**

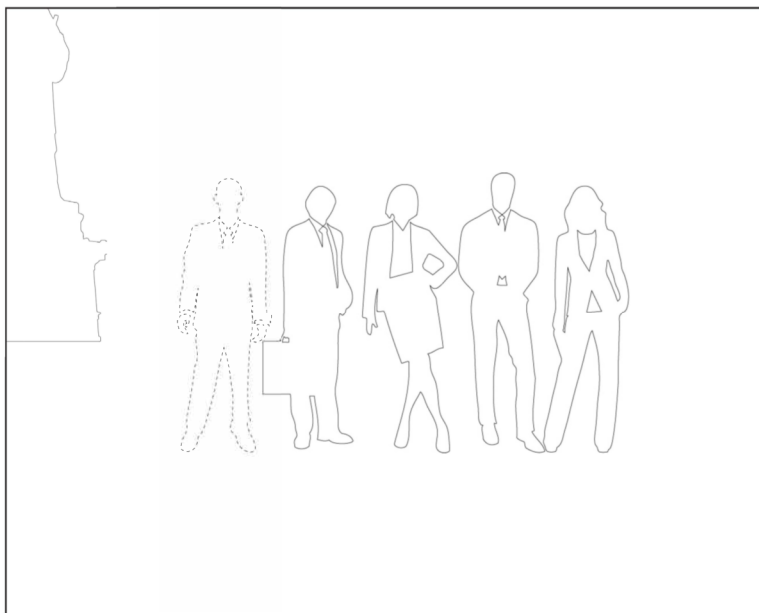
An augmented reality photography assistant or a virtual reality photography assisted mode allows a photographer to compose a particular shot and save the settings for that particular shot. The settings can include more than just typical camera settings like white balance, aperture, shutter speed, and ISO settings. The saved settings can also include positions of objects or persons within the particular shot, orientation of the camera itself, or physical location of the camera. The photographer can pass the camera or the saved settings to another person to take the particular shot. In a viewfinder or other shot-framing device of a camera featuring a virtual reality or augmented reality environment, the other person may see a series of guidelines or other positioning guides that allow the other person to compose the shot as the photographer envisioned. Alternatively, the photographer could save or receive the necessary settings and replicate a photo taken previously or recreate a photo taken by another photographer.

For example, suppose five business professionals attend a conference in New York City. As part of the conference, the five professionals visit the Statue of Liberty and desire to take a commemorative photo that includes all five people. As shown in Figure 1, the desired photo would include all five people and the entire Statue of Liberty. However, Figure 1 also illustrates the challenge faced by the photographer, who is illustrated as the man at the far left in dotted lines. He cannot both compose the desired photo and be in the desired photo simultaneously.



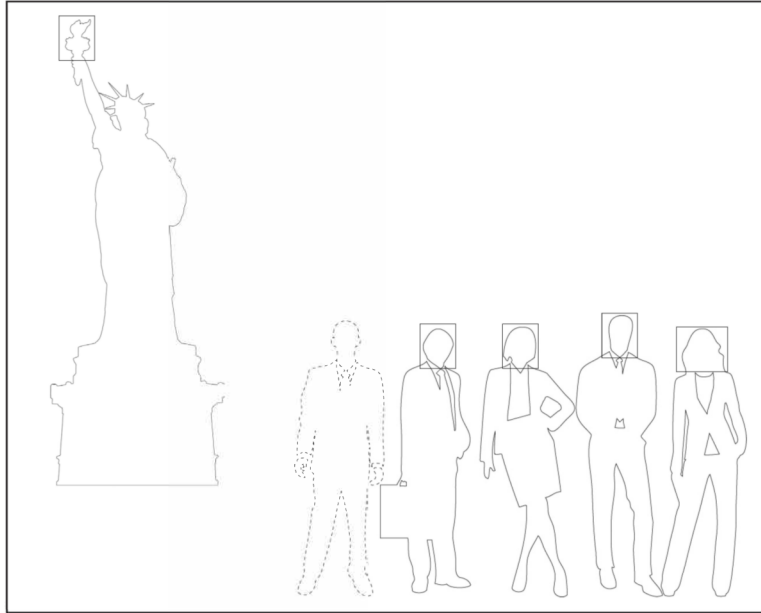
**Figure 1**

Another visitor to the Statue of Liberty sees the dilemma facing the group and offers to help. The photographer explains the desired photo to the helpful visitor. The helpful visitor receives the camera from the photographer and takes the photo illustrated in Figure 2. Although a great photo of the five professionals, the Statue of Liberty is cropped out of the final composition and does not match what the photographer envisioned.



**Figure 2**

An augmented reality photography assistant can significantly aid both the photographer and the helpful visitor in obtaining the desired commemorative photo. Augmented reality systems include sensors, overlays, or other supplemental features that can increase the amount of information presented to a photographer to help guide the photographer in obtaining the desired photo or video. For example, as illustrated in Figure 3, the augmented reality photography assistant adds guidelines around the faces of the four professionals and the torch of the Statue of Liberty. The guides allow the photographer to compose the desired photo, leaving room for the photographer to join the other four professionals. These guides can range from the simple to the complex. Simple guides, such as the guideline boxes around the face, are sufficient to markedly improve the final photo taken by the helpful visitor. As discussed below, more complex guides could guide the photographer in adjusting the geographic location of the camera, the physical orientation of the camera, overlay a previously taken photo on the live view seen by the photographer, and in other manners.

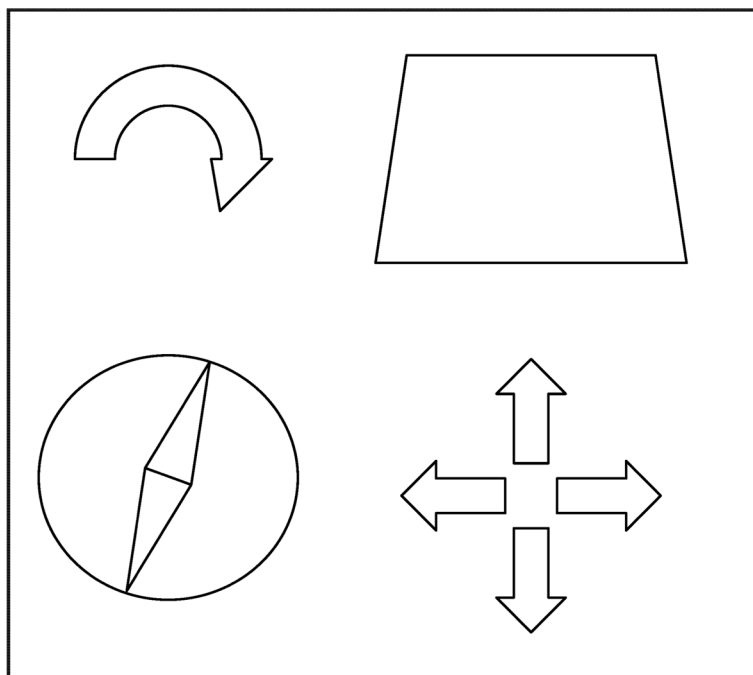


**Figure 3**

These guidelines could appear in a viewfinder or on a screen of the camera in a number of different ways. The viewfinder could include the five face/face-and-torch guides and the guides could change color as the helpful visitor moves the camera into the proper position. Alternatively, the viewfinder could show the desired photo as an overlay over the live action featuring the four business professionals in the originally composed photo. When the helpful visitor moves the camera into the desired position, the overlay could disappear or the guides could change color. The camera can even be configured to automatically take the picture when the helpful visitor moves the camera into the desired position. This “guest mode” could significantly aid the helpful visitor by reducing the number of tasks the helpful visitor needs to accomplish to obtain the desired photo.

The virtual guides could also include other indicators to aid the helpful visitor. As shown in Figure 4, the guides may also include a rotational arrow, a trapezoid that changes based on the tilt or pan of the camera itself, directional arrows, or a compass. Visual positioning systems and global positioning systems may also be represented in the viewfinder. The settings may also

include fine details such as aperture, shutter speed, white balance, ISO, or time of day settings. Any of these or similar guides can be used individually or collectively to aid the helpful visitor in orienting and positioning the camera as desired by the photographer.



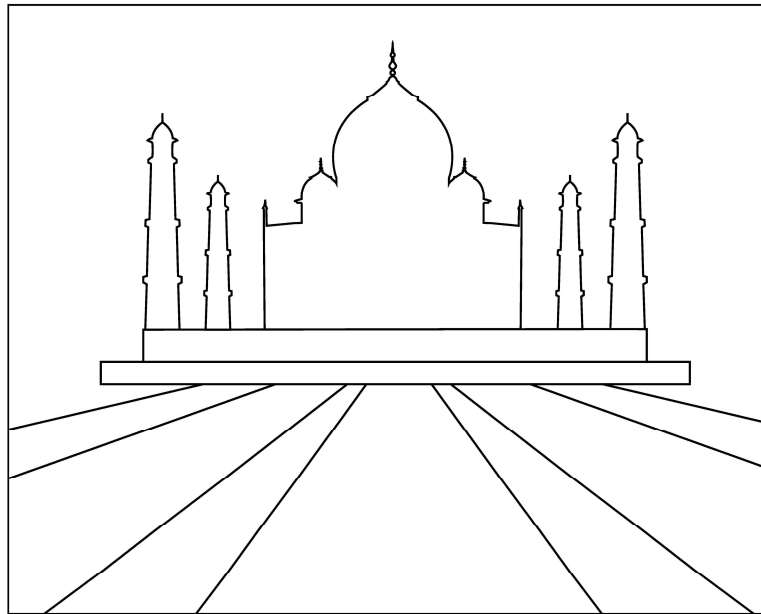
**Figure 4**

The augmented reality photography assistant can also aid photographers in replicating a photo taken previously or in recreating a photo taken by another photographer. Many people like to take the same photo to show effects over time, such as taking a photo of a child at each successive birthday or taking matching photos for a company website, a sports team, or a yearbook. Saving the camera orientation settings allows a photographer to take the same photo time after time in a reliable manner even when the physical location or the participants change.

Additionally, the augmented reality photography assistant can aid a photographer in recreating another photograph. When visiting a famous landmark, such as the Taj Mahal, the Eiffel Tower, or the Pyramids, there is often a famous or iconic way to capture a photo of the landmark or a person and the landmark. For example, at the Eiffel Tower, a popular photo is to

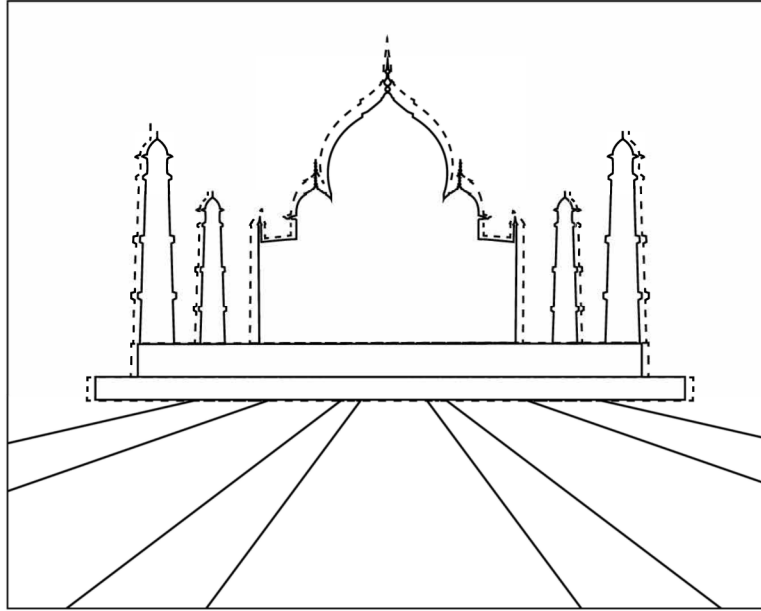


hold out one's hand and have the Eiffel Tower "resting" on top of the palm of the hand. At the Taj Mahal, an iconic photo involves capturing the building in the center, using the strong diagonal perspective lines of the reflecting pond and walkways to point directly towards and to highlight the building at the iconic proportions, as represented in Figure 5.



**Figure 5**

However, finding the correct geographic location and orientation for a camera to get the final proportions of the building, walkways, and reflecting pool correct may be difficult. Figure 6 illustrates the iconic photo of the Taj Mahal as seen through the camera viewfinder featuring the augmented reality photography assistant. The viewfinder includes a dotted pattern guide to help the photographer get into the correct position. Further, the photographer could be aided by any of the other guide systems discussed in reference to Figure 4 to replicate or recreate the desired photo of the Taj Mahal.



**Figure 6**

The augmented reality photography assistant or a virtual reality photography assisted mode allows a photographer to collect the necessary setting to replicate a particular shot. The photographer can recreate the desired photo him or herself at a later time, be in the desired photo, or transfer the saved setting to another photographer or camera, which could allow the other photographer or camera to recreate the original photo. The systems, sensors, components, and capacities of a virtual reality or augmented reality system can aid a photographer in staging and capturing a desired photo or video.