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# Guided capture for improved composition of group photographs

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## ABSTRACT

When a group of individuals want to get a photograph of the entire group, it is common to request a bystander to do so. However, strangers are generally unaware of the preferences for photo composition specific to the group or to the camera owner. The result is often an unsatisfactory group photograph due to incorrect camera orientation, zoom, or other parameters. Per techniques of this disclosure, one of the persons of a group of the group takes an initial reference photograph of the remaining members of the group with the desired background. The person hands over the camera to a third party, e.g., a bystander, and joins the remaining members of the group. The camera uses the reference photograph to guide the bystander to take a photo that matches the photographic parameters of the reference photograph closely, thus achieving a composition that is acceptable to the group.



## KEYWORDS

photo composition; smart camera; guided capture; guided photography; group photograph


## BACKGROUND

When a group of individuals want to get a photograph of the entire group, it is common to request a bystander to do so. However, strangers are generally unaware of the preferences for photo composition specific to the group or to the camera owner. The result is often an unsatisfactory group photograph due to incorrect camera orientation, zoom, or other parameters.

People often try to correct the photo composition by attempting to show the person taking the photo what they'd like to see in the photo. Unsatisfied with one bystander’s photo composition, the group sometimes requests another bystander to retake the photo. Not only is the group dissatisfied by this experience and left with less than satisfactory group photos, the photo-

taker is also pressured to try to take a photo that conforms to the group's specifications. These problems are magnified if the photo-taker and group members don't share a common language. If the group has one of its members take the group photo to achieve good composition, then the resulting group photo is unsatisfactory due to the absence of that group member.

DESCRIPTION

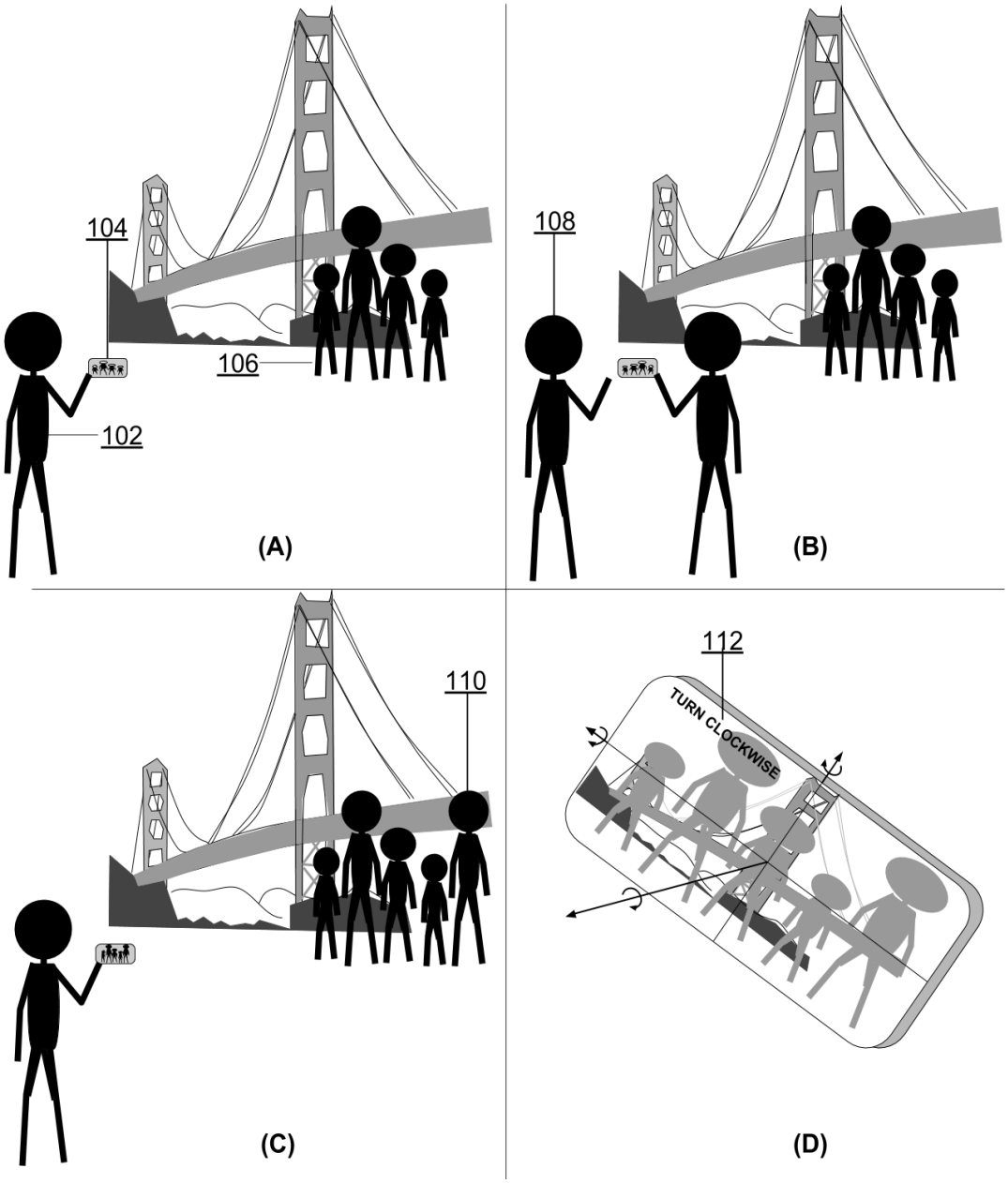


**Fig. 1: Composing a group photograph**

Fig. 1 illustrates composing group photographs, per techniques of this disclosure. As illustrated in Fig. 1(A), a person (102) is part of a group (106) that is desirous of taking a group photograph. The person takes a reference (pilot) photograph (104) comprising members of the group other than the photo-taker. In taking the reference photograph, the person frames the subjects and the background to their satisfaction, and also selects other camera parameters to obtain a photo with a composition to their liking.

As illustrated in Fig. 1(B), the person then hands the camera to a third party (108), e.g., a bystander, with a request to take a group photograph (Fig. 1B), and activates a feature that matches the image in the camera viewfinder with the reference photograph. As illustrated in Fig. 1(C), the person joins the group (110) and the third party takes the group photograph. As illustrated in Fig. 1(D), the camera (that implements techniques of this disclosure) automatically guides (112) the bystander to achieve a composition that matches the reference photograph, e.g., by providing instructions to rotate the camera (thus adjusting orientation, tilt) and to adjust the zoom level to achieve a match with the reference photograph.

To assist the third party taking the photograph, the viewfinder image includes accelerometer-based cues to rotate the device. A wireframe of the objects of the reference photograph and the border of the reference photograph is overlaid on the viewfinder to guide the third party in composing the photograph. Components used to guide the third party photo-taker include accelerometers for gross direction; large object matching between viewfinder images and outlines in the reference photograph; feature matching between reference and viewfinder images when their orientations are close; etc.

Further, in some implementations, the camera automatically triggers capture of the photograph when the viewfinder composition is satisfactorily close to the composition of the

reference photograph. More than one such photo can be taken, e.g., in burst mode, to enable the group members to select suitable photographs from the several photos automatically taken. Alternately, the best of several closely-timed photographs can be automatically selected.

In this manner, a group that wants to take a group photo can specify clearly their desired photo composition by capturing a reference photograph. A camera that implements the techniques described herein automatically guides the bystander to the desired photo composition.

Alternatively, the viewfinder can be replicated at another device that stays with a group member, who then directs the photo-taker regarding the orientation, zoom, or other parameters of the camera. Another alternative is to take multiple photos at a relatively low zoom and then auto-crop to the desired frame. However, this results in decreased image resolution. Still alternatively, several photographs can be automatically taken when the viewfinder composition overlaps with (parts of) the desired composition and later stitched together using image processing techniques such that boundaries of the reference photograph are faithfully included in the stitched photograph. This works as long as the subjects of the photograph do not move too much during capture of the multiple photographs.

## CONCLUSION

Per techniques of this disclosure, one of the persons of a group of the group takes an initial reference photograph of the remaining members of the group. The person hands over the camera to a third party, e.g., a bystander, and joins the remaining members of the group. The camera uses the reference photograph to guide the bystander to take a photo that matches the photographic parameters of the reference photograph closely, thus achieving a composition that is acceptable to the group.