

Connecting the Complementary-view Videos: Joint Camera Identification and Subject Association

Supplementary material

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1. Limitation and Discussion

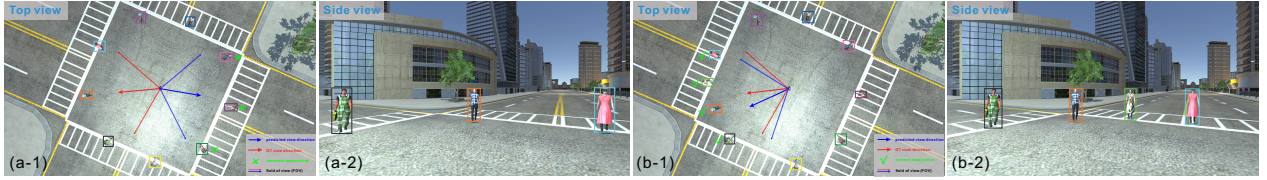


Figure 1. Illustration of the special cases of human distribution with perfect rotation symmetry.

We discuss the limitation of the proposed method on the special cases of human distribution with perfect rotation symmetry. For the perfect regular N-polygon distribution as shown in above Figure 1a, our method does get confused in this *rare case*, just like other geometry-based methods. However, with a very moderate location change as shown in Figure 1b, our method can well address the ambiguity. In practice, we can further take the frame-to-frame continuity to help address such ambiguity unless such perfect symmetry occurs at all the frames, which is even more rare.

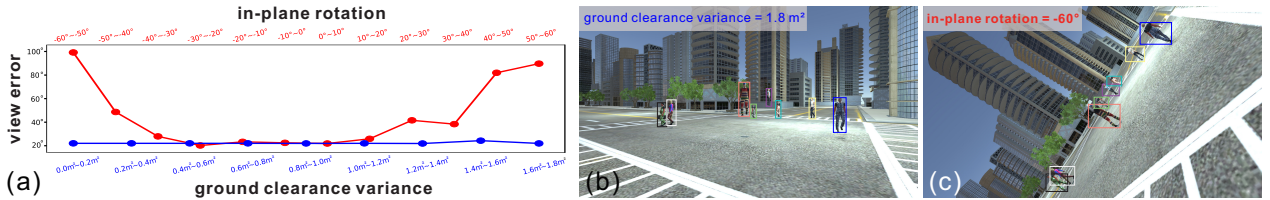


Figure 2. Illustration of some special cases not satisfied the assumptions in the proposed method.

We further provide more analysis of the cases where some assumptions in the proposed method are not held. For example, we assume that the subjects are located on a planar ground and the side-view camera is not with the significant in-plane rotation. Specifically, for the given scene in the virtual environment, we 1) adjust the persons to be not located in a plane by gradually increasing the variance of their ground clearances with the step of 0.02, and 2) gradually enlarge the in-plane rotation of the first-person view with the step of 1° . Figure 2 shows the statistical average results of the view direction estimation errors in each range (a) and several case illustrations (b-c). We can see that our method can handle the non-planer cases, because the x -axis distributions, i.e., the human center coordinate in Eq. (5) and y -axis distributions, i.e., the human height in Eq. (6), are not influenced by the altitudes of the subjects. For the in-plane rotation, our method may fail when the yaw angle is very large, e.g., 60° in (c), which is not common in real world.

As discussed above, we clarify that these assumptions in our method are not too strict for real cases.