Supplementary Material

In this supplementary material, we present additional details of PlanarTrack and experimental results. Specifically, **S1** shows more comparison of the training and testing sets on different challenging factors. In **S2**, we display more detailed results of each tracker on challenging factors using in terms of precision and success on the proposed PlanarTrack. **S3** presents the detailed construction of PlanarTrack$_{\text{BB}}$ from PlanarTrack for generic object tracking and demonstrates several examples. **S4** shows more results of generic trackers on PlanarTrack$_{\text{BB}}$.

S1. Comparison of Training and Testing Sets

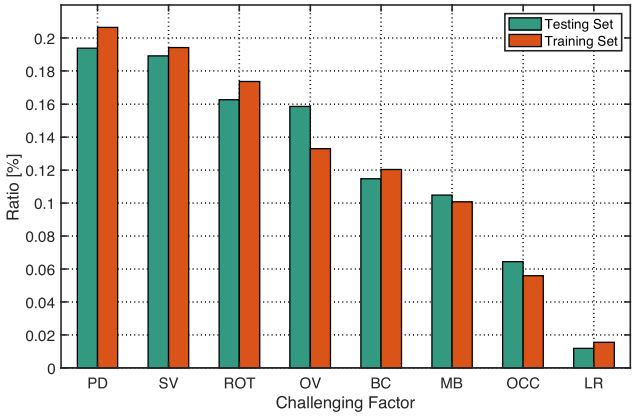

Figure 1. Distribution of sequences on each challenging factor.

In order to further compare the training and testing sets of PlanarTrack, we demonstrate the ratios of sequences in these two sets on eight different challenging factors in Fig 1. From Fig 1, we can see that the training and testing sets are close to each other in the distributions of videos in different challenges, which shows the consistency of training/testing split in PlanarTrack.

S2. Detailed Challenging Factor-based Results

We display more challenging factor-based results on PlanarTrack in this section. Fig. 2 shows performance of trackers on each challenging factor using precision, and Fig. 3 the results on different challenges using success.

S3. Detailed Construction of PlanarTrack$_{\text{BB}}$

In order to study the performance of generic object trackers in dealing with planar-like targets, we further develop a new benchmark named PlanarTrack$_{\text{BB}}$ based on our PlanarTrack. We achieve this by converting the four annotated corner points of the planar target into an axis-aligned bounding box. Suppose the four annotated points of the planar target are denoted as $\{(p_1^x, p_1^y), (p_2^x, p_2^y), (p_3^x, p_3^y), (p_4^x, p_4^y)\}$, then the axis-aligned box of the target will be formulated as

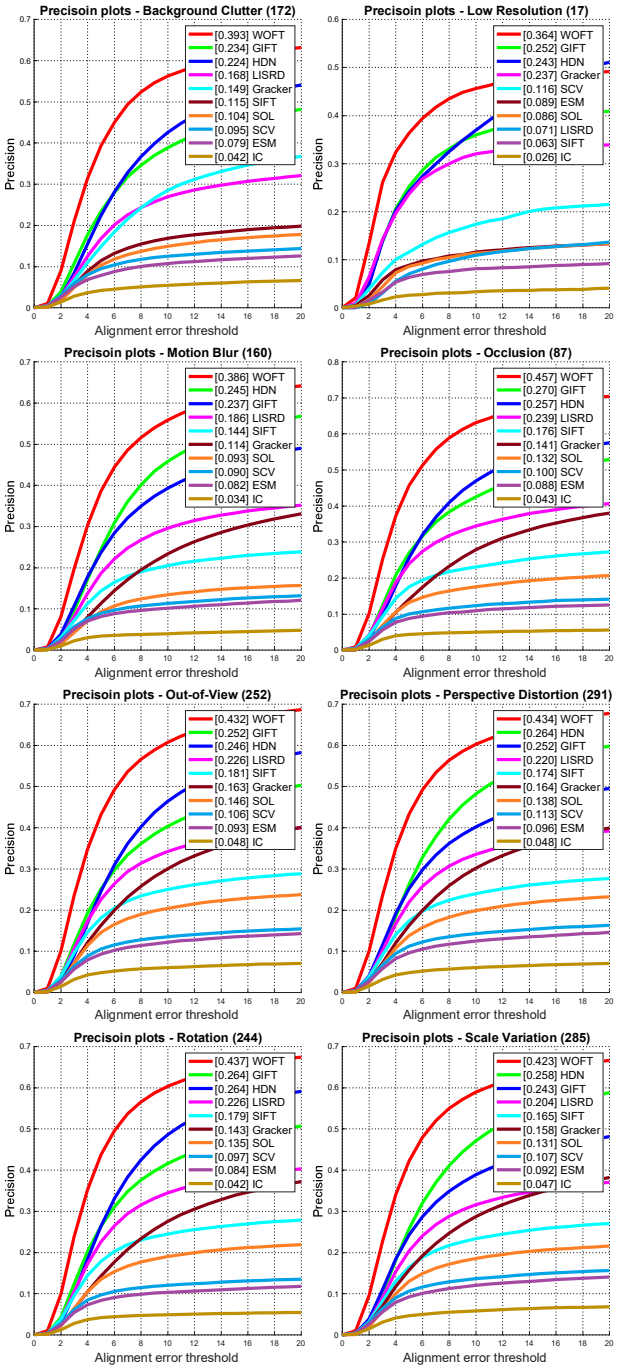

Figure 2. Performance of trackers on each challenging factor using precision. Best viewed in color.

$\{(x_{tf}, y_{tf}), (x_{br}, y_{br})\}$, where (x_{tf}, y_{tf}) and (x_{br}, y_{br}) are the coordinates of the top-left and bottom-right points of the bounding box and are obtained via

$$
\begin{aligned}
x_{tf} &= \max(\min(p_1^x, p_2^x, p_3^x, p_4^x), 1) \\
y_{tf} &= \max(\min(p_1^y, p_2^y, p_3^y, p_4^y), 1) \\
x_{br} &= \min(\max(p_1^x, p_2^x, p_3^x, p_4^x), w_{\text{img}}) \\
y_{br} &= \min(\max(p_1^y, p_2^y, p_3^y, p_4^y), h_{\text{img}})
\end{aligned}
$$

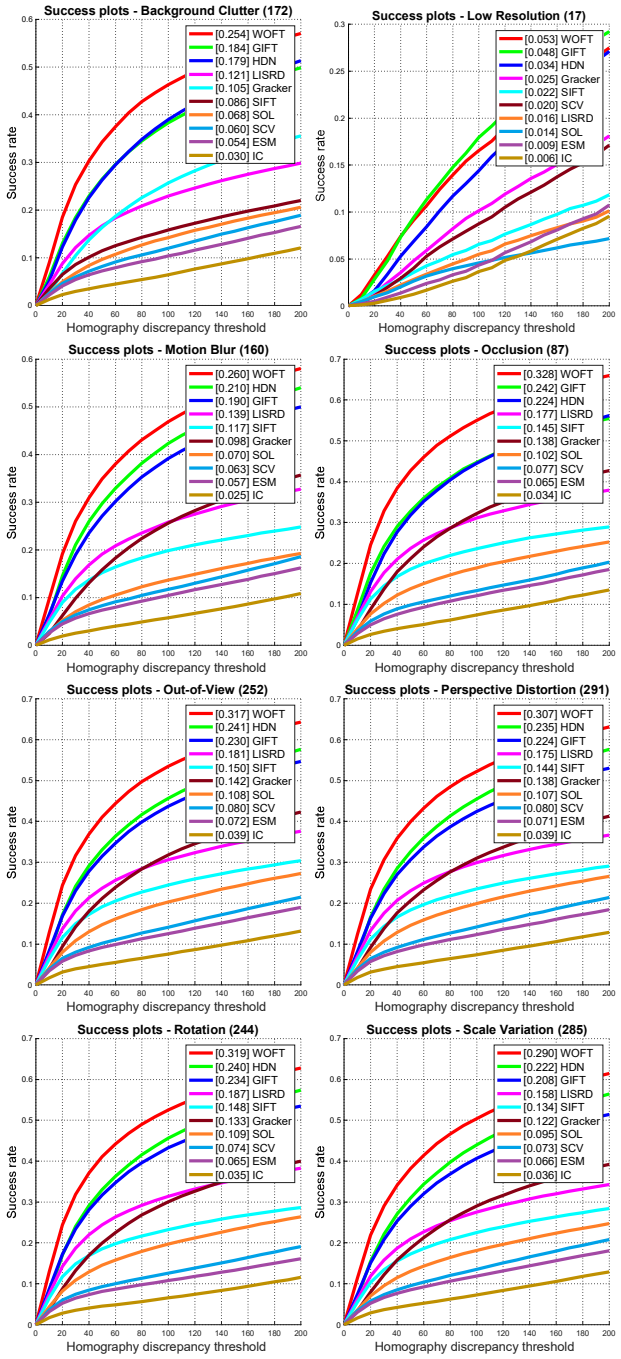

Figure 3. Performance of trackers on each challenging factor using success. Best viewed in color.

where w_{img} and h_{img} represent image width and height. We show several examples from PlanarTrack$_{\text{BB}}$ in Fig. 4.

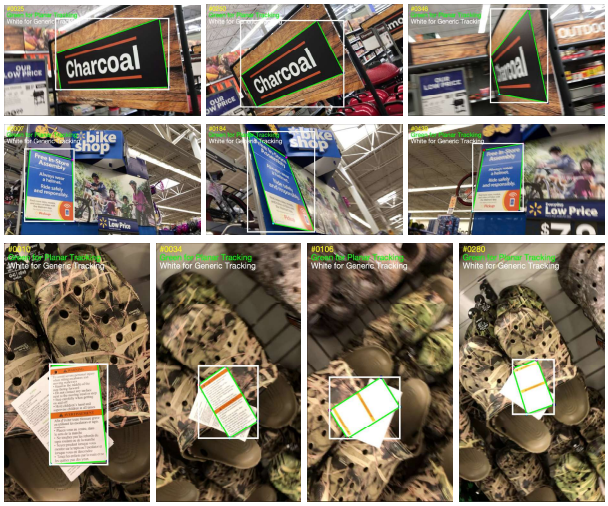

Figure 4. Examples from PlanarTrack$_{\text{BB}}$. The targets are annotated by the white axis-align bounding boxes for genetic visual tracking. Best viewed in color.

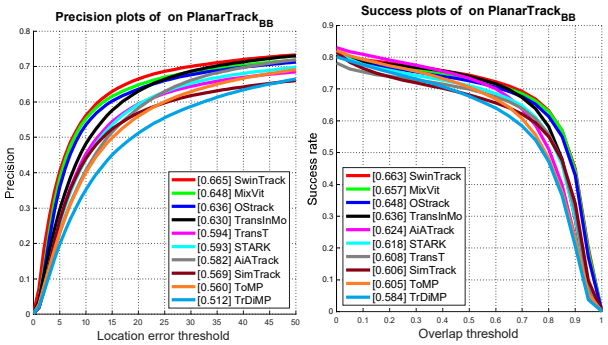

Figure 5. Performance of ten evaluated generic visual trackers on PlanarTrack$_{\text{BB}}$ using bounding box-based precision and success plots. Best viewed in color.

S4. More Results on PlanarTrack$_{\text{BB}}$

Fig. 5 demonstrates the evaluation results of ten excellent generic trackers on PlanarTrack$_{\text{BB}}$. We utilize bounding box-based precision and success plots as in generic tracking evaluation for assessment.