

Effect of various thresholds for discretized static & dynamic matching

The design of various configurable matching thresholds for discretized static and dynamic matching aims to ensure adaptability to different application scenarios with diverse characteristics.

The quality of captured videos can vary significantly based on factors such as the physical properties of the capturing devices and their deployment environments. For instance, when a camera is positioned at an elevated angle, as demonstrated in video 2, there is typically minimal occlusion across objects even in crowded scenes. In such cases, increasing the matching threshold can minimize mismatches by detecting small changes in track characteristics, thereby promoting accurate matching.

Conversely, in scenarios like the one depicted in demonstration video three, where the camera is positioned horizontally and closely focused on the objects of interest, any occlusion is likely to be significant. Here, a standard matching threshold should suffice to detect identity switches even in the presence of occlusion.

Our testing dataset MOT 16, MOT17, MOT20, and KITTI comprise various videos captured from different angles, using different capture equipment, and under different lighting conditions. Our framework aims to be generalizable across these varied conditions rather than being tailored to specific scenarios. Therefore, we empirically tuned the thresholds to values that yield satisfactory results across all test videos.

Figure 10, 11 and 12 illustrate the wide operating range of our framework, demonstrating its ability to be easily tuned for a specific use case.

While the static and dynamic matching may increase the chance of false positives if the object's relative position in the bounding box changes significantly, the extreme low latency execution of our method typically ensures that such changes are minimal, mitigating this concern. Intelligently suppressing the track when it is under occlusion is crucial, as the object is not visible and should not be associated with any track until it can be redetected.

