Appendix

1. Quantitative analysis of the object depth error with and without refinement

In Table[4], we show that how do the different depth estimation modules affect the final 3D mAP metric. As discussed in the main paper, object depth estimation is critical for accurate object localization, where small depth error (*e.g.* 0.5m) may cause the mismatch (IoU < the used 0.7 threshold). In addition to the detection accuracy, we also provide the collected depth error statistics with and without refinement in Figure 1. We report the mean and standard deviation of the depth error for the objects in different distance (m). As illustrated, our refinement module can consistently improve the baseline in different distance, which demonstrates the effectiveness of our refinement module.
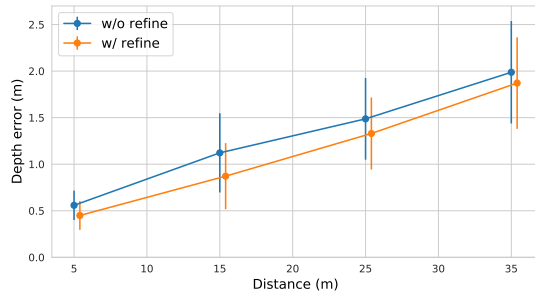

Figure 1. Quantitative analysis of object depth error (l1 distance).