Supplemental Material : Efficient Global 2D-3D Matching for Camera Localization in a Large-Scale 3D Map

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Abstract

In this supplemental material, we provide extra experiments in handling repetitive structures in the images.

1. Handling repetitive structures

If the 3D map is very large, it is almost inevitable to find repetitive structures. In order to test our method's resilience to repetitive structures, we made one modification of [1] that repeated feature points share the common low-level visual word in the vocabulary tree, not at least one common visual word in their top K ($K = 50$) visual word assignments. Moreover, to speed up the repeated structures detection, only the low-level visual word with largest number of feature points is processed, which corresponds to largest repeated structure. The parameters involved in repeated structure detection are the same as [1]. We have compared our method in terms of with and without the repetitive structure removal versions, and the conclusion is that the localization performance is the same. Four sample images on detected repeated structure are given in Fig-1.

Figure 1. The detected repeated structure on query images in Dubrovnik dataset. Yellow circle denote the feature points on repeated structure.

References

[1] A. Torii, J. Sivic, M. Okutomi, and T. Pajdla. Visual place recognition with repetitive structures. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 37(11):2346–2359, Nov 2015. 1