Supplementary Material:
Coarse-to-Fine Region Selection and Matching

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1. Additional Quantitative Evaluation on the Oxford Dataset

We provide another quantitative evaluation on the Oxford dataset. We evaluate the results of our algorithm and other detectors in terms of the number of pixels in image 1 covered by correctly and incorrectly matching regions. To this end, we define the detection rate as

$$\text{detection rate} = \frac{\text{\# of pixels covered by a correctly matching region}}{\text{\# of pixels in image 1}},$$

and the false alarm rate as

$$\text{false alarm rate} = \frac{\text{\# of pixels covered by no correctly matching region}}{\text{\# of pixels in image 1}}.$$

On these datasets, there are only minor occlusions. Therefore, nearly all pixels in image 1 correspond to pixels in image 2, and thus the denominator is all pixels. We use default parameters of the detectors, which cover most of the image. One may adjust the scales and peak thresholds of the detector to cover the entire image, however, very small regions are not discriminative and will fail to match correctly and very large regions (typically undergoing a transformation beyond affine) are only affine covariant and will fail to match correctly. Therefore, adjusting the default detector parameters does not improve detection or false alarm rates appreciably. ROC curves are created by varying the ratio threshold for matching. Results for all methods are shown in Figure 1. This shows that our method matches more pixels correctly for any given number of falsely matched pixels.

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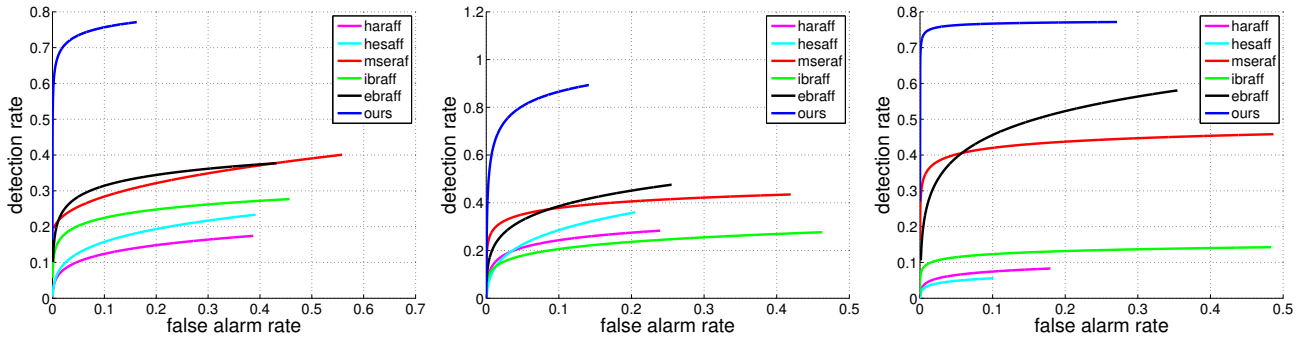

Figure 1. ROC curves for the Graffiti, Boat, and Wall datasets, respectively.

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