Learning Local Image Descriptors Supplementary Information

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Figure 1. Position estimation errors between interest points in aligned images.

1. Interest Point Error Statistics

We obtained statistics for the estimation of scale, orientation and position for interest points detected using the Harris-Laplace and SIFT DoG detectors [2, 1]. Our test set consisted of images from the Oxford Graffiti data set¹ and we applied 100 random synthetic affine warps to each with 1 unit of additive Gaussian noise. We detected interest points and estimated their sub-pixel location, scale and local orientation frame and we were able to histogram their errors between reference and warped images. The positions of the detected interest points in the test images were all warped back to the frame of the reference image. The orientation and scale estimates from the test interest points were also adjusted according to the inverse affine transform so that they could be compared with those from the reference image. Error statistics were only accumulated when a warped test point lay within a 2 pixel radius of a reference point.



Figure 2. Orientation estimation errors between interest points in aligned images.



Figure 3. Scale estimation errors between interest points in aligned images.

References

 D. G. Lowe. Distinctive image features from scale-invariant keypoints. *International Journal of Computer Vision*, 60:91– 110, 2004.

¹http://www.robots.ox.ac.uk/ vgg/research/affine/index.html

[2] K. Mikolajczyk and C. Schmid. Indexing based on scale invariant interest points. In *Proceedings IEEE International Conference on Computer Vision*, 2001.