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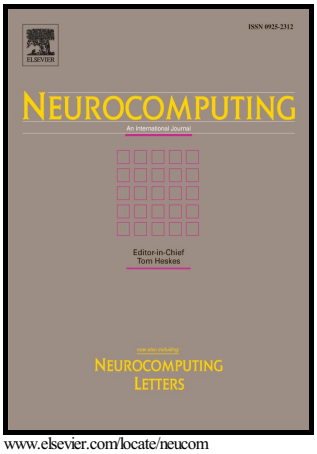


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# Geometric Affine Transformation Estimation via Correlation Filter for Visual Tracking

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**Abstract**

Correlation filter achieves promising performance with high speed in visual tracking. However, conventional correlation filter based trackers cannot tackle affine transformation issues such as scale variation, rotation and skew. To address this problem, in this paper, we propose a part-based representation tracker via kernelized correlation filter (KCF) for visual tracking. A Spatial-Temporal Angle Matrix (STAM), severed as confidence metric, is proposed to select reliable patches from parts via multiple correlation filters. These stable patches are used to estimate a 2D affine transformation matrix of the target in a geometric method. Specially, the whole combination scheme for these stable patches is proposed to exploit sampling space in order to obtain numerous affine matrices and their corresponding candidates. The diversiform candidates would help to seek for the optimal candidate to represent the object's accurate affine transformation in a higher probability. Both qualitative and quantitative evaluations on VOT2014 challenge and Object Tracking Benchmark (OTB) show that the proposed tracking method achieves favorable performance compared with other state-of-the-art methods.

*Keywords:* correlation filter, part-based, affine transformation estimation, object tracking

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