A COMPREHENSIVE STUDY OF CORRELATION FILTER LEARNING TOWARD PEAK STRENGTH FOR VISUAL TRACKING

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***Abstract*:**This paper presents a novel visual tracking approach to correlation filter learning toward peak strength of correlation response. In the previous methods during tracking some of the features are distractive like occlusion and local deformation which results in poor tracking performance. And in this paper we are going to solve this problem by using correlation filtering. Many applications are like unmanned control systems, motion analysis, video processing and security.

***Index Terms* – correlation filtering,elastic net,kernel method,regression,visual tracking.**

I. INTRODUCTION

Visual tracking plays a vital role in computer vision and signal processing with many different applications. Generally visual tracking is of two different types: single object tracking and multiple object tracking which are related with various research methodologies and different applications.

This paper mainly focuses at single object tracking. In these recent years it has been seen the great growth of development in visual tracking. Accuracy, robustness and running speed has been improved by the visual trackers. Still there are many challenges in such as nonrigid deformations, illumination changes, heavy occlusions, background clutters, scale variations and in-plane/out-of-plane rotations in practical applications of visual tracking.

Firstly we take video as input and least square regression is applied to the input which is used to remove any blur part or noise part by this regression. Later we use Kernel tricks to divide the video frames. By correlation filter the data is converted from spatial domain to frequency domain. And the Fast Fourier Transform is applied to detect the object. The converted frequency is having different scale values where Scale Estimation is applied to estimate these scale values. Thereby for feature extraction Histogram of orientation gradient features is used and the different features are extracted which are stored in matrix form and the output is generated using correlation filter

II. LITERATURE REVIEW

A.W.M.SMEULDERS

In realistic scenarios object tracking is a major problem which leads to most active area of research in computer vision. The more features such as clutter, occlusion, camera motion, low contrast specularities, illumination changes should be performed well by a good tracker. The proposed trackers performance has been calculated less than 10 videos. In this paper we evaluate trackers experimentally on 315 video fragments masking above features.

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Complex objects through rotations, occlusions and other distractions at over 20 times the rate of current state-of- the art techniques can be tracked by correlation filters which are not commonly used. The modern methods such as ASEF and UMACE perform better, whereas their training needs are poorly suited to tracking

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The most challenging problems in computer vision is accurate and robust visual tracking. Due to the lack of training data and robust approach for building a target appearance model. For addressing this particular problem we are mainly using discriminatively correlation filters(DCF).Specially regularized discriminative correlation filters(SRDCF) also can be proposed to track the address

Table 1

A Summary of Visual Tracking Techniques

Serial No	*Methods*	*Parameters*	*Advantages*	*Disadvantages*
1.	PCA(Principle Component Analysis)	Less error rate	Convey the maximum information in a certain number of bits	1.Gray values have no physical meaning 2.Cannot be used for classification
2.	SVM(Support Vector Machine)	Recognition rate	It is effective in high dimensional spaces	SVM does not directly provide probability estimates, these are calculated using an expensive
3.	HOG(Histogram Of Orientation Gradient Features)	Recognition time	Part-based-Requires more complex reasoning	Global approaches work well for small resolutions.
4.	SCM(Supply Chain Management)	Less error rate	1.Reduces lead time 2.Improved service levels	It is relatively more expensive mode of transport

III. CONCLUSION

Existing methods having many disadvantages like poor visual tracking. So to overcome these issues we use correlation filter learning method. We use another method called content related spatial regularization is used to calculate weight maps of the particular objects.

References

[1] A. Yilmaz, O. Javed, and M. Shah, “Object tracking: A survey,” ACM Comput. Surveys, vol. 38, no. 4, Dec. 2006, Art. no. 13.
[2] A. W. M. Smeulders et al., “Visual tracking: An experimental survey,” IEEE Trans. Pattern Anal. Mach. Intell., vol. 36, no. 7, pp. 1442–1468, Jul. 2014.
[3] D. S. Bolme, J. R. Beveridge, B. A. Draper, and Y. M. Lui, “Visual object tracking using adaptive correlation filters,” in Proc. IEEE Comput. Soc. Conf. Comput. Vis. Pattern Recognit. (CVPR), 2010, pp. 2544–2550.
[4] J. F. Henriques, R. Caseiro, P. Martins, and J. Batista, “Exploiting the circulant structure of tracking-by-detection with kernels,” in Proc. Eur. Conf. Comput. Vis. (ECCV), Florence, Italy, 2012, pp. 702–715.
[5] M. Danelljan, G. Häger, F. S. Khan, and M. Felsberg, “Accurate scale estimation for robust visual tracking,” in Proc. Brit. Mach. Vis. Conf. (BMVC), Linköping, Sweden, 2014, pp. 1–11.
[6] Y. Li and J. Zhu, “A scale adaptive kernel correlation filter tracker with feature integration,” in Proc. Eur. Conf. Comput. Vis. Workshop, Zürich, Switzerland, 2014, pp. 254–265.
[7] M. Danelljan, G. Häger, F. S. Khan, and M. Felsberg, “Learning spatially regularized correlation filters for visual tracking,” in Proc. IEEE Int. Conf. Comput. Vis. (ICCV), Santiago, Chile, 2015, pp. 4310–4318.
[8] K. Zhang, L. Zhang, Q. Liu, D. Zhang, and M.-H. Yang, “Fast visual tracking via dense spatio-temporal context learning,” in Proc. Eur. Conf. Comput. Vis. (ECCV), Zürich, Switzerland, 2014, pp. 127–141.
[9] M. Danelljan, F. S. Khan, M. Felsberg, and J. V. D. Weijer, “Adaptive color attributes for real-time visual tracking,” in Proc. IEEE Comput. Soc. Conf. Comput. Vis. Pattern Recognit. (CVPR), Columbus, OH, USA, 2014, pp. 1090–1097.
[10] J. F. Henriques, R. Caseiro, P. Martins, and J. Batista, “High-speed tracking with kernelized correlation filters,” IEEE Trans. Pattern Anal. Mach. Intell., vol. 37, no. 3, pp. 583–596, Mar. 2015.
[11] A. Adam, E. Rivlin, and I. Shimshoni, “Robust fragments-based tracking using the integral histogram,” in Proc. IEEE Comput. Soc. Conf. Comput. Vis. Pattern Recognit. (CVPR), vol. 1. New York, NY, USA, 2006, pp. 798–805.
[12] X. Li, Z. Han, L. Wang, and H. Lu, “Visual tracking via random walks on graph model,” IEEE Trans. Cybern., vol. 46, no. 9, pp. 2144–2155, Sep. 2016.
[13] X. Li, A. Dick, C. Shen, A. van den Hengel, and H. Wang, “Incremental learning of 3D-DCT compact representations for robust visual tracking,” IEEE Trans. Pattern Anal. Mach. Intell., vol. 35, no. 4, pp. 863–881, Apr. 2013.
[14] D. Wang, H. Lu, and M.-H. Yang, “Online object tracking with sparse prototypes,” IEEE Trans. Image Process., vol. 22, no. 1, pp. 314–325, Jan. 2013.
[15] T. Zhang, A. Bibi, and B. Ghanem, “In defense of sparse tracking: Circulant sparse tracker,” in Proc. IEEE Comput. Soc. Conf. Comput. Vis. Pattern Recognit. (CVPR), 2016, pp. 3880–3888.