

Optical flow and principal component analysis-based motion detection in outdoor videos

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Abstract

We propose a joint optical flow and principal component analysis (PCA) method for motion detection. PCA is used to analyze optical flows so that major optical flows corresponding to moving objects in a local window can be better extracted. This joint approach can efficiently detect moving objects and more successfully suppress small turbulence. It is particularly useful for motion detection from outdoor videos with low quality. It can also effectively delineate moving objects in both static and dynamic background. Experimental results demonstrate that this approach outperforms other existing methods by extracting the moving objects more completely with lower false alarms.



1. A. Mitiche and P. Bouthemy, "Computation and analysis of image motion: a synopsis of current problems and methods," *International Journal of Computer Vision*, vol. 19, no. 1, pp. 29-55, 1996.  

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3. A. Yilmaz, O. Javed, and M. Shah, "Object tracking: a survey," *ACM Computing Surveys*, vol. 38, no. 4, pp. 1-45, 2006.  

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Wu R, Liu B, Chen Y, Blasch E, Ling H and Chen G. (2017). A Container-Based Elastic Cloud Architecture for Pseudo Real-Time Exploitation of Wide Area Motion Imagery (WAMI) Stream. *Journal of Signal Processing Systems*. **88**:2. (219-231). Online publication date: 1-Aug-2017.

<https://doi.org/10.1007/s11265-016-1206-6>

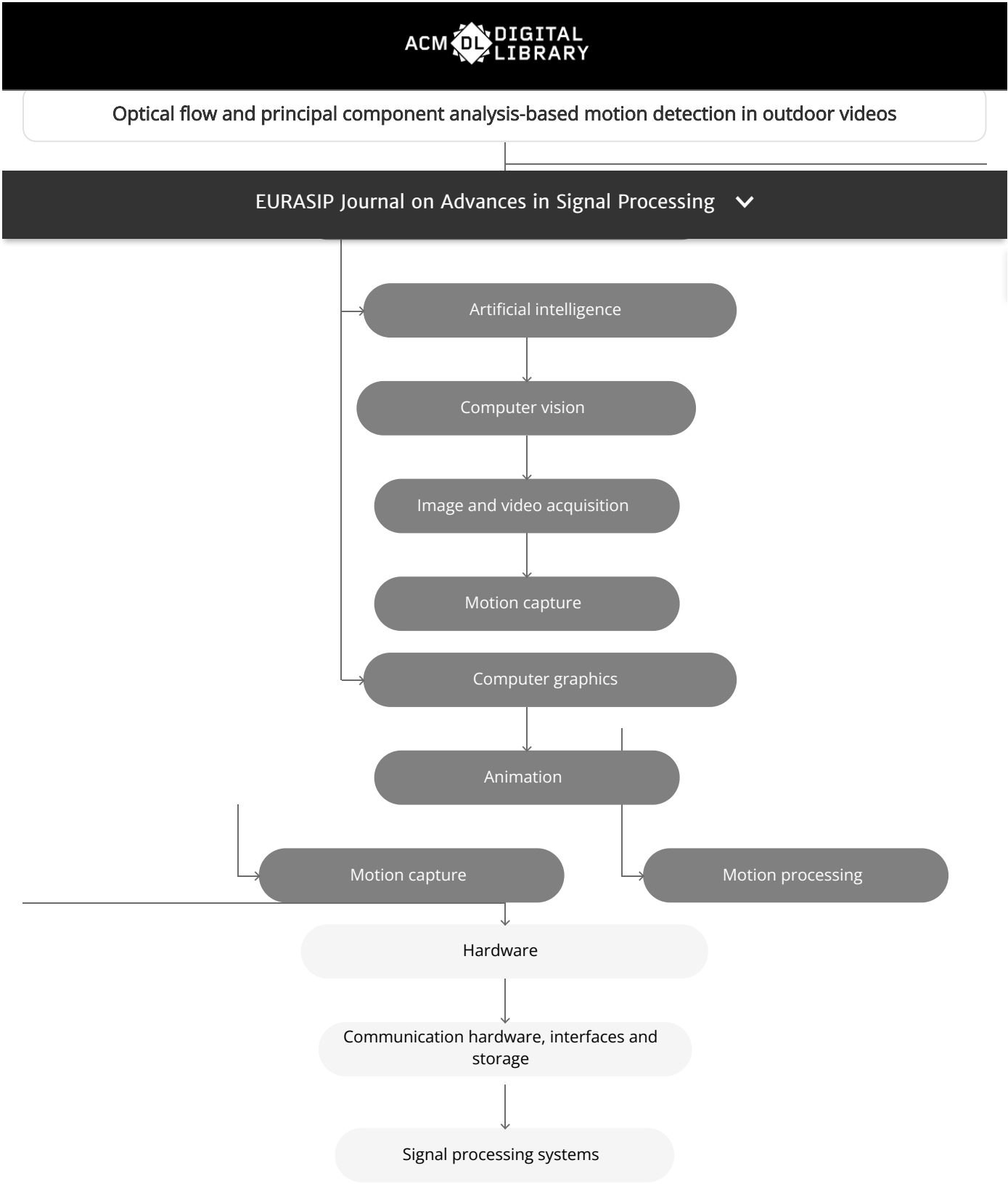
K. M and Channappayya S. (2016). An Optical Flow-Based Full Reference Video Quality Assessment Algorithm. *IEEE Transactions on Image Processing*. **25**:6. (2480-2492). Online publication date: 1-Jun-2016.

<https://doi.org/10.1109/TIP.2016.2548247>

Wang L, Chin K, Soh S and Raad R. (2019). Novel joint routing and scheduling algorithms for minimizing end-to-end delays in multi Tx-Rx wireless mesh networks. *Computer Communications*. **72**:C. (63-77). Online publication date: 1-Dec-2015.

<https://doi.org/10.1016/j.comcom.2015.05.014>

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