## References

- R. Poppe, "A survey on vision-based human action recognition," *Image and vision computing*, vol. 28, no. 6, pp. 976–990, 2010.
- [2] A. F. Bobick and J. W. Davis, "The recognition of human movement using temporal templates," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 23, no. 3, pp. 257–267, 2001.
- [3] D. Weinland and E. Boyer, "Action recognition using exemplar-based embedding," in *Proceedings of the IEEE Computer Society Conference on Computer* Vision and Pattern Recognition, Anchorage, AL, June 2008, pp. 1–7.
- [4] A. A. Efros, A. C. Berg, G. Mori, and J. Malik, "Recognizing action at a distance," in *Proceedings of the IEEE International Conference on Computer Vision*, France, October 2003, pp. 726–733. Electronic Theses & Dissertations
- [5] N. Data and By Triggsb"Histograms of oriented gradients for human detection," in Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition, San Diego, CA, June 2005.
- [6] H. Ragheb, S. Velastin, P. Remagnino, and T. Ellis, "Human action recognition using robust power spectrum features," in *Proceedings of the IEEE International Conference on Image Processing*, San Diego, CA, October 2008, pp. 753–756.
- [7] S. Danafar and N. Gheissari, "Action recognition for surveillance applications using optic flow and svm," in *Proceedings of the Asian Conference on Computer Vision*, ser. part 2, Tokyo, Japan, November 2007, pp. 457–466.
- [8] N. Ikizler, R. G. Cinbis, and P. Duygulu, "Human action recognition with line and flow histograms," in *Proceedings of the International Conference on Pattern Recognition*, Tampa, FL, December 2008, pp. 1–4.
- [9] D. Tran, A. Sorokin, and D. Forsyth, "Human activity recognition with metric learning," in *Proceedings of the IEEE European Conference on Computer*

*Vision*, ser. LNCS 5302, vol. Part I. Marseille, France: Springer-Verlag Berlin Heidelberg, 2008, pp. 549–562.

- [10] H. Wang, A. Klaser, C. Schmid, and C.-L. Liu, "Action recognition by dense trajectories," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, Colorado Springs, CO, June 2011, pp. 3169–3176.
- [11] J. Xiao, H. Cheng, H. Sawhney, and F. Han, "Geo-spatial aerial video processing for scene understanding and object tracking," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, Anchorage, AL, June 2008, pp. 1–8.
- [12] —, "Vehicle detection and tracking in wide field-of-view aerial video," in Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition, San Francisco, CA, June 2010, pp. 679–684.
- [13] A. Mittal and N. Paragios, "Motion-based background subtraction using adaptive kernel density estimation," in *Proceedings of the IEEE Computer* Society Conference on Computer Vision and Pattern Recognition, vol. 2, Washington, DC, June July 2004, pp. 11-302 rill-309.
  Washington, DC, June July 2004, pp. 11-302 rill-309.
- [14] J. Ritscher, J. Katoli S. Joga and A. Blake, "A probabilistic background model for tracking," in *Proceedings of the IEEE European Conference on Computer Vision*, vol. 2, Dublin, Ireland, June-July 2000, pp. 336–350.
- [15] A. Elgammal, R. Duraiswami, and L. S. Davis, "Probabilistic tracking in joint feature-spatial spaces," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, vol. 1, Madison, WI, June 2003, pp. 781–788.
- [16] A. Monnet, A. Mittal, N. Paragios, and V. Ramesh, "Background modeling and subtraction of dynamic scenes," in *Proceedings of the IEEE International Conference on Computer Vision*, Nice, France, October 2003, pp. 1305–1312.
- [17] J. Zhong and S. Sclaroff, "Segmenting foreground objects from a dynamic textured background via a robust Kalman filter," in *Proceedings of the IEEE International Conference on Computer Vision*, vol. 1, Nice, France, October 2003, pp. 44–50.

- [18] Y. Sheikh and M. Shah, "Bayesian modelling of dynamic scenes for object detection," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 27, pp. 1778–1792, November 2005.
- [19] H. Zhong, J. Shi, and M. Visontai, "Detecting unusual activity in video," in Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition, vol. 2, Washington, DC, June–July 2004, pp. 819– 826.
- [20] J. Kim and K. Grauman, "Observe locally, infer globally: a space-time mrf for detecting abnormal activities with incremental updates," in *Proceedings* of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition, Miami, FL, June 2009, pp. 2921–2928.
- [21] A. Basharat, A. Gritai, and M. Shah, "Learning object motion patterns for anomaly detection and improved object detection," in *Proceedings of* the IEEE Computer Society Conference on Computer Vision and Pattern Recognition, Anchorage, AL, June 2008, pp. 1–8.
- [22] T. Zhang, H. Lu, and S. Z. Li, "Learning semantic scene models by object classification and trajector classification, Brickedings of the IEEE Computer Society Conference on Computer Disson that Pattern Recognition, Miami, FL June 2009, pp. 1940-1945.
- [23] A. Adam, E. Rivlin, I. Shimshoni, and D. Reinitz, "Robust real-time unusual event detection using multiple fixed-location monitors," *IEEE Transactions* on Pattern Analysis and Machine Intelligence, vol. 30, no. 3, pp. 555–560, March 2008.
- [24] R. Mehran, A. Oyama, and M. Shah, "Abnormal crowd behavior detection using social force model," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, Miami, FL, June 2009, pp. 935–942.
- [25] Y. Cong, J. Yuan, and J. Liu2, "Sparse reconstruction cost for abnormal event detection," in *Proceedings of the IEEE Computer Society Conference* on Computer Vision and Pattern Recognition, Colorado Springs, CO, June 2011, pp. 3449–3456.
- [26] V. Mahadevan, W. Li, V. Bhalodia, and N. Vasconcelos, "Anomaly detection in crowded scenes," in *Proceedings of the IEEE Computer Society Conference*

on Computer Vision and Pattern Recognition, San Francisco, CA, June 2010, pp. 1975–1981.

- [27] O. Boiman and M. Irani, "Detecting irregularities in images and in video," International Journal of Computer Vision, vol. 1, no. 74, pp. 17–31, August 2007.
- [28] L. Kratz and K. Nishino, "Anomaly detection in extremely crowded scenes using spatio-temporal motion pattern models," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, Miami, FL, June 2009, pp. 1446–1453.
- [29] H. S. J. O. T. Min, B. Yoon, and T. Ejima, "Visual recognition of static/dynamic gesture: Gesture-driven editing system," *Journal of Visual Languages and Computing*, vol. 10, pp. 291–309, 1999.
- [30] J. Yang, Y. Xu, and C. S. Chen, "Human action learning via hidden markov model," *IEEE Transactions on Systems, Man and Cybernetics*, pp. 34–44, 1997.
- [31] N. M. Oliver, Burkosaria and McBarentlan & "A bayesian computer vision system for modeling during Thereactions is sufficient and machine intelligence wol. 22, no. 8, pp. 831-843, August 2000.
- [32] K. Murphy, "Bayesian map learning in dynamic environments," in Proceedings of the Neural Information Processing Systems. MIT Press, 1999, pp. 1015–1021.
- [33] D. Zhang, D. Gatica-Perez, S. Bengio, and I. McCowan, "Semi-supervised adapted hmms for unusual event detection," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, vol. 1, San Diego, CA, June 2005, pp. 611–618.
- [34] C. Fanti, L. Zelnik-Manor, and P. Perona, "Hybrid models for human motion recognition," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, San Diego, CA, June 2005.
- [35] M.Weber, M.Welling, and P. Perona, "Unsupervised learning of models for recognition," in *Proceedings of the IEEE European Conference on Computer Vision*, ser. Lecture Notes in Computer Science, vol. 1842, Dublin, Ireland, June-July 2000, pp. 18–32.

- [36] Y. Song, L. Goncalves, and P. Perona., "Unsupervised learning of human motion," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 25, no. 25, pp. 1–14, 2003.
- [37] C. Schuldt, I. Laptev, and B. Caputo, "Recognizing human actions: A local svm approach," in *Proceedings of the IEEE International Conference on Pattern Recognition*, vol. 3, 2004, pp. 32–36.
- [38] C.-W. Hsu and C.-J. Lin, "A comparison of methods for multiclass support vector machines," *IEEE Transactions on Neural Networks*, vol. 13, no. 2, pp. 415–425, March 2002.
- [39] C.-C. Chen and J. K. Aggarwal, "Recognizing human action from a far field of view," in *Proceedings of the IEEE Workshop on Motion and Video Computing*, Snowbird, Utah, December 2009, pp. 1–7.
- [40] C. M. Bishop, Pattern Recognition and Machine Learning, J. K. Michael Jordan and B. Scholkopf, Eds. LLC, 233 Spring Street, NY: Springer, 2006.
- [41] B. D. Lucas and T. Kanade, "An iterative image registration technique with an applica- tion to stero vision," in *Proceedings of the International Joint Conferences on Artificial Intelligence*, 1981, pp. 674–679. Electronic Theses & Dissertations
- [42] I. Lapter, M. Marszalek, 10. Schulid, and B. Rozenfeld, "Learning realistic human actions from movies," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, Anchorage, AL, June 2008.
- [43] N. Dalal, B. Triggs, and C. Schmid, "Human detection using oriented histograms of flow and appearance," in *Proceedings of the IEEE European Conference on Computer Vision*, Austria, May 2006, pp. 428–441.
- [44] D. G. Lowe, "Distinctive image features from scale-invariant keypoints," International Journal of Computer Vision, vol. 60, no. 2, pp. 91–110, 2004.
- [45] J. Yuan, Y. Wu, and M. Yang, "Discovery of collocation patterns: from visual words to visual phrases," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, 2007, pp. 1–8.
- [46] B. Chakraborty, M. Holte, T. Moeslund, and J. Gonzalez, "Selective spatiotemporal interest points," *Computer Vision and Image Understanding*, vol. 116, no. 3, pp. 396–410, 2012.

- [47] X. Cui, Q. Liu, M. Gao, and D. N. Metaxas, "Abnormal detection using interaction energy potentials," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, Colorado Springs, CO, June 2011, pp. 3161–3167.
- [48] K. Q. Weinberger, J. Blitzer, and L. K. Saul, "Distance metric learning for large margin nearest neighbor classification," in *Proceedings of the Neural Information Processing Systems*. Cambridge, MA: MIT Press, 2006.
- [49] K.-R. Muller, S. Mika, G. Ratsch, K. Tsuda, and B. Scholkopf, "An introduction to kernel-based learning algorithms," *IEEE Transactions on Neural Netwroks*, vol. 12, no. 2, pp. 181–201, March 2001.
- [50] C.-C. Chang and C.-J. Lin, "LIBSVM: A library for support vector machines," ACM Transactions on Intelligent Systems and Technology, vol. 2, pp. 27:1–27:27, 2011.
- [51] M. Blank, L. Gorelick, E. Shechtman, M. Irani, and R. Basri, "Actions as space-time shapes," in *Proceedings of the IEEE International Conference on Computer Vision*, Beijing, China, October 2005, pp. 1395–1402. University of Moratuwa, Sri Lanka.
- [52] R. Akbari, S. Kwekrond, NThankowicz, D'Applying support vector machines to imbalanced datasets? in Proceedings of the IEEE European Conference on Machine Learning, Pisa, Italy, September 2004, pp. 39–50.
- [53] K. Hutan and P. Daygulu, "Pose sentences: A new representation for action recognition using sequence of pose words," in *Proceedings of the IEEE International Conference on Pattern Recognition*, Tampa, FL, December 2008, pp. 1–4.
- [54] N. Goyette, P.-M. Jodoin, F. Porikli, J. Konrad, and P. Ishwar, "changedetection.net: A new change detection benchmark dataset," in *Proceedings of* the IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops, June 2012, pp. 1–8.
- [55] K. Toyama, J. Krumm, B. Brumitt, and B. Meyers, "Wallflower: Principles and practice of background maintenance," in *Proceedings of the IEEE International Conference on Computer Vision*, Corfu, Greece, September 1999.
- [56] "An abnormal activity datasets," available from http://www.cse.yorku.ca/vision/research/anomalous-behaviour.

- [57] L. Li, W. Huang, I. Y. Gu, and Q. Tian, "Foreground object detection from videos containing complex background," in *Proceedings of the ACM International Conference on Multimedia*, 2003, pp. 2–10.
- [58] M. Hofmann, P. Tiefenbacher, and G. Rigoll, "Background segmentation with feedback: The pixel-based adaptive segmenter," in *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops*, June 2012, pp. 38–43.
- [59] "Abnormal crowd activity dataset of university of minnesota," available from http://mha.cs.umn.edu/movies/crowd-activity-all.avi.
- [60] A. Zaharescu and R. Wildes, "Anomalous behaviour detection using spatiotemporal oriented energies, subset inclusion histogram comparison and event-driven processing," in *Proceedings of the IEEE European Conference* on Computer Vision, ser. LNCS 6311, vol. Part 1, Crete, Greece, September 2010, pp. 563–576.



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