

Table 3: Detection performance in terms of precision, recall, F1, and F0.5.

Scenario	S1				S2			
	P	R	F1	F0.5	P	R	F1	F0.5
LOF	71.48±00.66	91.79±02.25	80.36±01.08	74.78±00.74	60.03±00.61	84.89±01.45	70.32±00.73	63.76±00.61
OSVM	84.28±00.82	78.80±02.64	81.42±01.53	83.11±00.94	72.58±00.89	65.85±01.38	69.05±01.01	71.12±00.89
uLSIF	88.82±01.16	75.53±03.66	81.58±01.97	85.76±00.91	66.50±03.05	84.66±04.45	74.35±01.23	69.41±02.08
KMM	83.24±00.55	77.30±01.88	80.15±01.01	81.97±00.56	75.15±00.72	69.63±01.04	72.28±00.66	73.97±00.61
locKMM	95.58±00.41	75.93±01.54	84.62±00.96	90.87±00.52	82.61±01.87	72.28±01.02	77.10±01.33	80.31±01.63

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7. REFERENCES

- [1] L. M. Aiello, G. Petkos, C. Martin, D. Corney, S. Papadopoulos, R. Skraba, A. Goker, I. Kompatsiaris, and A. Jaimes. Sensing trending topics in twitter. *IEEE Transactions on Multimedia*, 15(6):1268–1282, 2013.
- [2] J. Allan. Introduction to topic detection and tracking. In *Topic detection and tracking*, pages 1–16. Springer, 2002.
- [3] M. M. Breunig, H.-P. Kriegel, R. T. Ng, and J. Sander. LOF: identifying density-based local outliers. In *ACM Sigmod Record*, volume 29, pages 93–104, 2000.
- [4] C.-C. Chang and C.-J. Lin. LIBSVM: a library for support vector machines. *ACM Transactions on Intelligent Systems and Technology*, 2(3):1–27, 2011.
- [5] I. Dhillon, Y. Guan, and B. Kulis. A unified view of kernel k-means, spectral clustering and graph cuts. Technical Report TR-04-25, University of Texas at Austin, 2005.
- [6] A. K. Farahat, A. Ghodsi, and M. S. Kamel. A novel greedy algorithm for Nyström approximation. In *AISTATS*, pages 269–277, 2011.
- [7] A. K. Farahat and M. S. Kamel. Statistical semantics for enhancing document clustering. *Knowledge and Information Systems*, 28(2):365–393, 2011.
- [8] T. Fawcett. An introduction to roc analysis. *Pattern Recognition Letters*, 27(8):861–874, 2006.
- [9] D. Filev and F. Tseng. Novelty detection based machine health prognostics. In *the 2006 International Symposium on Evolving Fuzzy Systems*, pages 193–199. IEEE, 2006.
- [10] A. Guille and C. Favre. Mention-anomaly-based event detection and tracking in twitter. In *the 2014 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, pages 375–382. IEEE, 2014.
- [11] H. Hachiya, M. Sugiyama, and N. Ueda. Importance-weighted least-squares probabilistic classifier for covariate shift adaptation with application to human activity recognition. *Neurocomputing*, 80:93–101, 2012.
- [12] S. Hido, Y. Tsuboi, H. Kashima, M. Sugiyama, and T. Kanamori. Statistical outlier detection using direct density ratio estimation. *Knowledge and Information Systems*, 26(2):309–336, 2011.
- [13] J. Huang, A. J. Smola, A. Gretton, K. M. Borgwardt, and B. Schölkopf. Correcting sample selection bias by unlabeled data. In *NIPS*, pages 601–608, 2007.
- [14] M. Karkali, F. Rousseau, A. Ntoulas, and M. Vazirgiannis. Efficient online novelty detection in news streams. In *Web Information Systems Engineering–WISE 2013*, pages 57–71. 2013.
- [15] M. Kemmler, E. Rodner, E.-S. Wacker, and J. Denzler. One-class classification with gaussian processes. *Pattern Recognition*, 46(12):3507–3518, 2013.
- [16] Y.-Q. Miao, A. K. Farahat, and M. S. Kamel. Auto-tuning kernel mean matching. In *Workshop on Incremental Clustering, Concept Drift and Novelty Detection at the 2013 IEEE ICDM*, pages 560–567, 2013.
- [17] Y.-Q. Miao, A. K. Farahat, and M. S. Kamel. Discriminative density-ratio estimation. In *2014 SIAM International Conference on Data Mining (SDM)*, pages 830–838, 2014.
- [18] C. A. Micchelli, Y. Xu, and H. Zhang. Universal kernels. *The Journal of Machine Learning Research*, 7:2651–2667, 2006.
- [19] S. Middleton, L. Middleton, and S. Modafferi. Real-time crisis mapping of natural disasters using social media. *IEEE Intelligent Systems*, 29(2):9–17, 2014.
- [20] Oxford University Press. Rt this: OUP dictionary team monitors twitterer’s tweets. <http://blog.oup.com/2009/06/oxford-twitter/>, Retrieved in January 2015.
- [21] A. Saha and V. Sindhwani. Learning evolving and emerging topics in social media: a dynamic nmf approach with temporal regularization. In *WSDM*, pages 693–702. ACM, 2012.
- [22] B. Schölkopf, R. C. Williamson, A. J. Smola, J. Shawe-Taylor, and J. C. Platt. Support vector method for novelty detection. In *NIPS*, pages 582–588, 1999.
- [23] A. J. Smola, L. Song, and C. H. Teo. Relative novelty detection. In *AISTATS*, pages 536–543, 2009.
- [24] X. Yan, J. Guo, S. Liu, X. Cheng, and Y. Wang. Learning topics in short texts by non-negative matrix factorization on term correlation matrix. In *SDM*, pages 749–757, 2013.
- [25] L. Zelnik-Manor and P. Perona. Self-tuning spectral clustering. In *NIPS*, pages 1601–1608, 2004.
- [26] A. Zubiaga and H. Ji. Harnessing web page directories for large-scale classification of tweets. In *WWW’2013 Companion*, pages 225–226. ACM, 2013.