Prediction-time Efficient Classification Using Feature Computational Dependencies

Related Works on test-time cost-efficient models and areas including budgeted learning, cost-aware data acquisition, and sparse feature learning.

Implicit cost-aware methods

<u>Cascades of classifiers</u>

References

[1] Junbiao Pang, Huihuang Lin, Li Su, Chunjie Zhang, Weigang Zhang, Lijuan Duan, Qingming Huang, and Baocai Yin. 2016. Accelerate convolutional neural networks for binary classification via cascading cost-sensitive feature. In Image Processing (ICIP), 2016 IEEE International Conference on. IEEE, 1037–1041.

Cited By

- Pasupuleti, Sirish Kumar, Narasinga Rao Miniskar, Vasanthakumar Rajagopal, and Raj Narayana Gadde. "A novel method to regenerate an optimal CNN by exploiting redundancy patterns in the network." In *2017 IEEE International Conference on Image Processing (ICIP)*, pp. 4407-4411. IEEE, 2017.

[2] Jay Pujara, Hal Daumé III, and Lise Getoor. 2011. Using classifier cascades for scalable e-mail classification. In Proceedings of the 8th Annual Collaboration, Electronic messaging, Anti-Abuse and Spam Conference. ACM, 55–63.

<u>Decision-tree based</u>

References

[1] Liyun Li, Umut Topkara, Baris Coskun, and Nasir Memon. 2009. CoCoST: a computational cost efficient classifier. In Data Mining, 2009. ICDM'09. Ninth IEEE International Conference on. IEEE, 268–277.

[2] Ming Tan and Jeffrey C Schlimmer. 1989. Cost-sensitive concept learning of sensor use in approach and recognition. In Proceedings of the sixth international workshop on Machine learning. Elsevier, 392–395.

[3] César Ferri, Peter Flach, and José Hernández-Orallo. 2002. Learning decision trees using the area under the ROC curve. In ICML, Vol. 2. 139–146.

[4] Liyun Li, Umut Topkara, and Nasir Memon. 2011. ACE-Cost: acquisition cost efficient classifier by hybrid decision tree with local SVM leaves. In International Workshop on Machine Learning and Data Mining in Pattern Recognition. Springer, 60–74.

<u>Boosting-based</u>

References

[1] Lev Reyzin. 2011. Boosting on a budget: Sampling for feature-efficient prediction. In Proceedings of the 28th International Conference on Machine Learning (ICML-11). Citeseer, 529–536.

Explicit cost-aware methods

References
[1] Bradley Efron, Trevor Hastie, Iain Johnstone, Robert Tibshirani, et al. 2004. Least angle regression. The Annals of statistics 32, 2 (2004), 407–499

[2] Alex Grubb and Drew Bagnell. 2012. Speedboost: Anytime prediction with uniform near-optimality. In Artificial Intelligence and Statistics. 458–466.

[3] Zhixiang Xu, Kilian Q Weinberger, and Olivier Chapelle. 2012. The greedy miser: learning under test-time budgets. In Proceedings of the 29th International Conference on International Conference on Machine Learning. Omnipress, 1299–1306.

[4] Matt J Kusner, Wenlin Chen, Quan Zhou, Zhixiang Eddie Xu, Kilian Q Weinberger, and Yixin Chen. 2014. Feature-Cost Sensitive Learning with Submodular Trees of Classifiers.. In AAAI. 1939–1945.

[5] Cheng-Lung Huang and Chieh-Jen Wang. 2006. A GA-based feature selection and parameters optimization for support vector machines. Expert Systems with applications 31, 2 (2006), 231–240.

Budget learning and cost-aware data acquisition
References

[1] Kun Deng, Yaling Zheng, Chris Bourke, Stephen Scott, and Julie Masciale. 2013. New algorithms for budgeted learning. Machine learning 90, 1 (2013), 59–90.

[2] Feng Nan and Venkatesh Saligrama. 2017. Adaptive Classification for Prediction Under a Budget. In Advances in Neural Information Processing Systems. 4730–4740.

[3] Charles X Ling, Victor S Sheng, and Qiang Yang. 2006. Test strategies for costsensitive decision trees. IEEE Transactions on Knowledge and Data Engineering 18, 8 (2006), 1055–1067.