

[1]邱一卉,林成德.基于随机森林和单类支持向量机的电信行业客户流失预测[J].厦门大学学报(自然科学版),2013,52(05):603.

[doi:10.6043/j.issn.0438-0479.2013.05.005]

QIU Yi-hui,LIN Cheng-de*.Customer-churn Prediction for Telecom Enterprises Based on Random Forest and One-class SVM

[J].Journal of Xiamen University(Natural Science),2013,52(05):603.[doi:10.6043/j.issn.0438-0479.2013

点击

复制

基于随机森林和单类支持向量机的电信行业客户流

导航/NAVIGATE

[本期目录/Table of Contents](#)

[下一篇/Next Article](#)

[上一篇/Previous Article](#)

工具/TOOLS

[引用本文的文章/References](#)

[下载 PDF/Download PDF\(1135KB\)](#)

[立即打印本文/Print Now](#)

[推荐给朋友/Recommend](#)

统计/STATISTICS

摘要浏览/Viewed

全文下载/Downloads 404

评论/Comments 247



《厦门大学学报(自然科学版)》[ISSN:0438-0479/CN:35-1070/N] 卷: 52卷 期数: 2013年05期
页码: 603 栏目: 出版日期: 2013-08-15

Title: Customer-churn Prediction for Telecom Enterprises Based on Random Forest and One-class SVM

作者: [邱一卉](#); [林成德](#)

1.厦门理工学院管理学院,福建 厦门 361024; 2.厦门大学信息科学与技术学院,福建 厦门 361005

Author(s): [QIU Yi-hui¹](#); [LIN Cheng-de^{2*}](#)

1.School of Management,Xiamen University of Technology,Xiamen 361024,China;
2.School of Information Science and Engineering,Xiamen University,Xiamen 361005,China

关键词: [客户流失预测](#); [随机森林](#); [转导推理](#); [单类支持向量机](#)

Keywords: [customer-churn prediction](#); [random forest](#); [transduction](#); [one-class SVM](#)

分类号: TP 181

DOI: 10.6043/j.issn.0438-0479.2013.05.005

文献标志码: -

摘要: 针对电信行业客户流失问题,使用随机森林方法建立了初步的预测模型,对比电信行业原用的各种预测模型,其准确率有明显改善;针对模型特征维数众多的特点,进一步提出基于随机森林和转导推理的特征提取方法,对数据集进行降维,并引入单类支持向量机(support vector machine,SVM)算法得到最终的预测模型.实验表明,流失预测模型具有更高的预测准确率以及针对预测结果的部分可解释性.

Abstract: A customer-churn prediction model for the telecom enterprises is firstly established by random forest method.It is obviously superior in prediction accuracy with respect to the models actively used by the telecom enterprises.In order to get better,a feature extraction method based on random forest and transduction is proposed to heavily reduce the high-dimension of the data; furthermore,a one-class support vector Machine(OC-SVM)algorithm is introduced to perform the prediction under the new attribute-space.Experiment results show that the improved model gets a much better accuracy as well as some reasonable explanation for the results.This new method is likely to be a powerful candidate in the customer-churn prediction for telecom enterprises.

- [1] Chih P W,Chiu I T.Turning telecommunications call details to churn prediction:a data mining approach[J].Expert Systems with Applications,2002,23(2):103-112.
- [2] Kim H S,Yoon C H.Determinants of subscriber churn and customer loyalty in the Korean mobile telephony market [J].Telecommunications Policy,2004,28(9):751-765.
- [3] Thomas V.A novel profit maximizing metric for measuring classification performance of customer churn prediction models[J].IEEE Transactions on Knowledge and Data Engineering,2013,25(5):961-973.
- [4] Xiao J,He C Z.Structure learning of Bayesian classifier based on SODM and its application in customer classification [J].Journal of Management Sciences,2008,21(4):54-60.
- [5] Yossi R,Elad Y T,Noam S.Predicting customer churn in mobile networks through analysis of social groups[C]//SIAM International Conference on Data Mining. Ohio:Society for Industrial and Applied Mathematics,2010,732-741.
- [6] Liu J,Yang G Y.Research on customer churn prediction model based on IG_NN double attribute selection[C]//2nd International Conference on Information Science and Engineering.Hangzhou:IEEE,2010:5306-5309.
- [7] Ultch.An emergent self-organizing feature maps used for prediction and prevention of churn in mobile phone markets[J].Journal of Targeting,Measurement and Analysis for Marketing,2002,10(4):314-324.
- [8] Au W,Chen K C,Yao X.A novel evolutionary data mining algorithm with applications to churn prediction[J].IEEE Transactions on Evolutionary Computation,2003,7(6):532-545.
- [9] 庄维云,覃正,赵宇,等.SVM方法及其在客户流失预测中的应用研究[J].系统工程理论与实践,2007,1(7):105-110.
- [10] 罗彬,邵培基,夏国恩.基于多分类器动态选择与成本敏感优化集成的电信客户流失预测研究[J].管理学报,2012,9(9):1373-1381.
- [11] Breiman L.Random forests[J].Machine Learning,2001,45(1):5-32.
- [12] 王丽婷,丁晓青,方驰.基于随机森林的人脸关键点精确定位方法[J].清华大学学报,自然科学版,2009,21(4):84-87.
- [13] Breiman L,Friedman J,Olshen R.Classification and regression trees[M].New York:Chapman & Hall,1984.
- [14] 邱一卉,林成德.基于随机森林方法的异常样本检测方法[J].福建工程学院学报,2007,5(4):392-396.
- [15] 陈毅松,汪国平,董士海.基于支持向量机的渐进直推式分类学习算法[J].软件学报,2003,14(3):451-460.
- [16] 邱一卉,林成德.基于随机森林和转导推理的特征提取方法[J].厦门大学学报:自然科学版,2010,49(3):333-338.
- [17] Yang J,Alejandro F F,Yang J Y,et al.A complete kernel fisher discriminant framework for feature extraction and recognition[J].IEEE Transactions on Pattern Analysis and Machine Intelligence,2005,27(2):230-244.
- [18] Platt J.Fast training of support vector machines using sequential minimal optimization[M]//Advances in Kernel Methods Support Vector Learning.Cambridge:MIT Press,1999:185-208.

备注/Memo: 收稿日期:2013-02-20 *通信作者:cdlin@xmu.edu.cn

更新日期/Last Update: 2013-08-15