电子与信息学报
JOURNAL OF ELECTRONICS & INFORMATION TECHNOLOGY

电子与信息学报 » 2011, Vol. 33 » Issue (5) :1055-1061 DOI: 10.3724/SP.J.1146.2010.00896

具有磁场效应的大间隔支持向量机

陶剑文*①② 王士同①*

①(江南大学信息工程学院 无锡 214122) ②(浙江工商职业技术学院信息工程学院 宁波 315012)

Maximal Margin Support Vector Machine with Magnetic Field Effect

Tao Jian-wen①② Wang Shi-tong①*

①(School of Information Engineer, Southern Yangtze University, Wuxi 214122, China)
②(School of Information Engineer, Zhejiang Business Technology Institute, Ningbo 315012, China)

摘要 参考文献 相关文章

Download: PDF (287KB) HTML 1KB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 为了提升模式分类泛化性能，该文提出一种新颖的具有磁场效应的大间隔支持向量机(MFSVM)。为了学习最优分割超平面，MFSVM通过引入最小化的*q*-磁场带，使得一类(或正常类)被包含其中，而另一类(或异常类)与该*q*-磁场带的间隔尽可能地大，从而实现类内内聚性的提高和类间间隔的增大，增强SVM学习泛化能力。在人造和实际数据集上实验结果显示，MFSVM分别在二类和一类模式分类上的性能均优于或等同于相关方法。

关键词： 模式分类 磁场效应 新奇检测 支持向量机 核方法

Abstract： In this paper, a novel maximal margin Support Vector Machine with Magnetic Field effect (MFSVM) is proposed in allusion to the improvement of the generalization performance of pattern classification issue. By introducing a minimum *q*-magnetic field tape, the basic idea of MFSVM is to find an optimal hyper-plane with magnetic field effect such that one class (or normal patterns) can be enclosed in the *q*-magnetic field tape due to the magnetic attractive effect, while at the same time the margin between the *q*-magnetic field tape and the other class (or abnormal patterns) is as large as possible due to magnetic repulsion, thus implementing both maximum between-class margin and minimum within-class volume so as to improve the generalization capability of the proposed method. Experimental results obtained with benchmarking and synthetic datasets show that the proposed algorithm is effective and competitive to other related methods in such cases as two-class and one-class pattern classification respectively.

Keywords： Pattern classification Magnetic field effect Novelty detection Support Vector Machine (SVM) Kernel approach

Received 2010-08-24;

本文基金:

国家自然科学基金(60975027，60903100)和宁波市自然科学基金(2009A610080)资助课题

通讯作者: 陶剑文 Email: jianwen_tao@yahoo.com.cn

引用本文:

陶剑文, 王士同.具有磁场效应的大间隔支持向量机[J] 电子与信息学报, 2011,V33(5): 1055-1061

Tao Jian-Wen, Wang Shi-Tong.Maximal Margin Support Vector Machine with Magnetic Field Effect[J] , 2011,V33(5): 1055-1061

链接本文:

http://jeit.ie.ac.cn/CN/10.3724/SP.J.1146.2010.00896 或 http://jeit.ie.ac.cn/CN/Y2011/V33/I5/1055

Service
把本文推荐给朋友
加入我的书架
加入引用管理器
Email Alert
RSS
作者相关文章
陶剑文
王士同