

论文

基于软间隔委员会投票主动学习的遥感影像分类

程玉虎, 汪 婵, 王雪松, 孙伟芳

中国矿业大学 信息与电气工程学院, 江苏 徐州 221116

摘要:

针对遥感影像数据具有大量未标记样本的特性, 采用主动学习方法从未标记样本中, 挑选出最有利于改善遥感影像分类性能的样本添加到已标记样本中进行学习, 以有效避免过多的人工干预, 减少标记样本数量。进一步, 针对传统基于委员会投票主动学习难以处理噪声及线性不可分数据的问题, 提出基于软间隔的委员会投票主动学习方法, 对样本间隔添加考虑样本分布的松弛项, 以弱化硬间隔对噪声数据分类的影响。遥感影像数据集上的仿真结果表明, 所提算法能够使用较少的训练样本来获得较高的分类精度。

关键词: 软间隔; 委员会投票; 主动学习; 遥感影像

Classification of remote sensing image based on active learning using committee and soft margin

Abstract:

Aiming at the characteristics of remote sensing images having large scale of unlabeled samples, an active learning algorithm was adopted to select the most valuable samples that are beneficial for the improvement of classification performance from unlabeled samples. These selected samples were added into labeled samples and participate in the learning of classifier. In this way, overmuch manual intervention can be avoided and the amount of labeled samples can be decreased. Because the traditional active learning algorithm using committee was difficult to deal with noise or linear inseparable data, an active learning algorithm using committee and soft margin was proposed by adding a slack item based on sample distribution to a hard margin which can weaken the influence of hard margin on classification of noise data. The simulation results on remote sensing image show that the proposed active learning algorithm can obtain higher classification accuracy with little training samples.

Keywords: soft margin; committee; active learning; remote sensing image

收稿日期 2012-06-04 修回日期 2012-12-11 网络版发布日期 2013-07-26

DOI:

基金项目:

国家自然科学基金资助项目(61072094, 61273143); 教育部新世纪优秀人才支持计划资助项目(NCET-10-0765)

通讯作者: 程玉虎

作者简介: 程玉虎(1973—), 男, 安徽淮南人, 教授

作者Email: chengyuhu@163.com

参考文献:

本刊中的类似文章

扩展功能

本文信息

Supporting info

PDF(1454KB)

[HTML全文]

参考文献PDF

参考文献

服务与反馈

把本文推荐给朋友

加入我的书架

加入引用管理器

引用本文

Email Alert

文章反馈

浏览反馈信息

本文关键词相关文章

软间隔; 委员会投票; 主动学习; 遥感影像

本文作者相关文章

程玉虎

PubMed

Article by Cheng, Y.H