

光子学报 2011, **40**(10) 1494-1499 DOI: 10.3788/gzxb20114010.1494 ISSN: 1004-4213 CN: 61-1235/O4

[本期目录](#) | [下期目录](#) | [过刊浏览](#) | [高级检索](#)

[\[打印本页\]](#) [\[关闭\]](#)

论文

基于最小二乘支持向量机回归的背景偏振光谱二向反射分布建模分析

赵永强,柳丹,陈超,程咏梅

(西北工业大学 自动化学院,西安 710072)

摘要:

详细分析了土壤背景偏振光谱二向反射分布函数与探测角及探测方位角之间关系.提出了基于最小二乘支持向量机回归的偏振光谱二向反射分布函数建模,将有限实验观测条件下测量得到的少数偏振光谱二向反射分布函数扩展到2n空间范围内任意入射及观测条件.通过模型结果和实验结果分析比较,表明该模型能很好地满足准确度要求.

关键词: 偏振光谱二向反射分布函数 探测几何条件 LS-SVM回归

Spectropolarimetric Bidirectional Reflectance Distribution Modeling for Background Based on LS-SVM Regression

ZHAO Yong-qiang,LIU Dan,CHEN Chao,CHENG Yong-mei

(College of Automation,Northwestern Polytechnical University,Xi'an 710072,China)

Abstract:

Relationship between detection geometry and spectropolarimetric bidirectional reflectance distribution function for soil background was analyzed in detail.The modeling of spectropolarimetric bidirectional reflectance distribution function was proposed based on LS-SVM,aiming to extend the value of measured spectropolarimetric bidirectional reflectance distribution function with limited geometry to whole hemi-sphere space.Results show that the predicted value and experimental value are close and meet the need of correction.

Keywords: Spectropolarimetric bidirectional reflectance distribution function Detection geometry LS-SVM Regression

收稿日期 2010-11-09 修回日期 2011-05-24 网络版发布日期 2011-10-25

DOI: 10.3788/gzxb20114010.1494

基金项目:

国家自然科学基金(No.61071172,No.60602056,No.60634030)、航空科学基金(No.20105153022)和西北工业大学基础研究基金(No.JC200941)资助

通讯作者: 赵永强

作者简介:

参考文献:

- [1]ZHAO Yong-qiang,GONG PENG,PAN Quan.Object detection by spectropolarimetric imagery fusion [J].IEEE Transactions on Geoscience and Remote Sensing,2008,46(10): 3337-3345.
- [2]ZHAO Yong-qiang,ZHANG Guo-hua,JIE Fei-ran,et al.Unsupervised classification of spectropolarimetric data by region-based evidence fusion[J].IEEE Geoscience and Remote Sensing Letters,2011,8(4): 755-759.
- [3]赵永强,潘泉,程咏梅.成像偏振光谱遥感及应用[M].国防工业出版社,2011.
- [4]WANG Dao-rong,ZHAO Yong-qiang,PAN Quan.Classification of spectropolarimetric imagery based on fuzzy clutter and evidence theory [J] .Acta Photonica Sinica,2007,36(12): 2365-2370.
王道荣,赵永强,潘泉.基于模糊聚类和证据理论的光谱偏振图像分类[J] .光子学报,2007,36(12): 2365-2370.
- [5]ZHAO Yong-qiang,PAN Quan,ZHANG Hong-cai.Study of adaptive multi-band polarization image fusion[J].Acta Photonica Sinica,2007,36(7): 1356-1359.
赵永强,潘泉,张洪才.自适应多波段偏振图像融合研究[J].光子学报,2007,36(7): 1356-1359.
- [6]TREIBITZ T,SCHECHNER Y Y.Polarization: beneficial for visibility enhancement[C].IEEE Conference on Computer Vision and Pattern Recognition(CVPR),2009.
- [7]ZHAO Yong-qiang,ZHANG Lei,ZHANG D,et al.Object separation by polarimetric and spectral imagery fusion [J] Computer Vision and Image Understanding,2009,113(8): 3337-3345.
- [8]WOLFF L B.Polarization-based material classification from specular reflection[J].IEEE Transactions on Pattern Analysis and Machine Intelligence,1990,12(11): 1059-1071.
- [9]WU T X,ZHAO Y S.The bidirectional polarized reflectance model of soil[J].IEEE Transactions on Geoscience and Remote Sensing,2005,43(12): 2854-2859.
- [10]GEORGIEV G,GATEBE C K,BUTLER J,et al.BRDF analysis of savanna vegetation and salt-pan samples[J].IEEE Transactions on Geoscience and Remote Sensing,2009,47(8): 2546-2556.
- [11]DUNCAN D D,HAHN D V,THOMAS M E.Physics-based polarimetric BRDF models[C].SPIE,2003,5192: 129-140.
- [12]SUKENS J A K,VANDEWALLE J.Least squares support vector machine classifiers[J].Neural Processing Letters,1999,9(3): 293-300.
- [13]SAUNDERS C,GAMMERMAN A,VOVK V.Ridge regression learning algorithm in dual variables[C].Proc.of the 15th Int.Cont on Machine Learning ICML-98,Madison-Wisconsin,1998.
- [14]ESPINOZA M,SUYKENS J,De MOOR B.Imposing symmetry in least squares support vector machines regression[C].Proceedings of the 44th IEEE Conference on Decision and Control,and the European Control Conference 2005.
- [15]VALYON J,HORVATH G.A robust LS-SVM regression world academy of science[J].Engineering and Technology,2005,7: 148-153.
- [16]CUI Wen-tong,YAN Xue-feng.Adaptive weighted least square support vector machine regression integrated with outlier detection and its application in QSAR[J].Chemometrics and Intelligent Laboratory Systems,2009,98(2): 130-135.
- [17]CHEN Chao,ZHAO Yong-qiang,CHENG Yong-mei,et al.Materials classification based on spectropolarimetric BRDF imagery [J].Acta Photonica Sinica,2010,39(6): 1026-1033.
陈超,赵永强,程咏梅,等.基于偏振光谱BRDF 图像的物质分类[J].光子学报,2010,39(6):1026-1033.

本刊中的类似文章

文章评论 (请注意:本站实行文责自负, 请不要发表与学术无关的内容!评论内容不代表本站观点.)

扩展功能

本文信息

- Supporting info
- PDF(2207KB)
- HTML
- 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

- 偏振光谱二向反射分布函数
- 探测几何条件
- LS-SVM回归

本文作者相关文章

- 赵永强

反馈人	<input type="text"/>	邮箱地址	<input type="text"/>
反馈标题	<input type="text"/>	验证码	<input type="text" value="8750"/>
反馈内容	<input type="text"/>		
<input type="button" value="提交"/>			