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《农业水土资源监控研究》专题快报

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【文献速递】

1．1961—2020年中国玉米需水量及水分盈亏的时空变化格局

文献源：中国农业大学学报,2022-03-16

摘要：为明确不同区域玉米需水量的时空变化,根据联合国粮食与农业组织（FAO）推荐的彭曼公式和作物系数法,利用1961—2020年558个典型气象站点的标准气象数据对我国不同区域玉米的生育期作物需水量进行计算,并结合玉米生育期内的降水量进一步分析不同区域玉米的水分盈亏时空变化。结果表明,全国玉米生育期内需水量在区域间呈现明显的差异,多年平均在285～987mm/年,春玉米的需水量要高于夏玉米,二者的多年平均值分别为468和326mm/年。其中西北农牧区、北部中低高原农牧区和东北农林区为春玉米需水量的高值区,需水量分别为699、566和496mm/年。玉米的水分亏缺量在不同区域间也有明显的差异,各区域的水分亏缺量在3～638mm/年。西北农牧区春玉米的水分亏缺量最高,其均值高达638mm/年,其次为北部中低高原农牧区和东北农林区,水分亏缺量分别为324和145mm/年。从这60年的需水量和水分亏缺量变化趋势来看,不同区域呈现不同变化趋势,其中长江中下游平原农作区、华南农林渔区和西北农牧区的春玉米水分亏缺量呈下降趋势,北部中低高原农牧区、四川盆地农作区和西南中高原农林区呈增加趋势,夏玉米水分亏缺量呈下降趋势。此外,1961—2020年玉米全生育期需水量在年际间存在一定的变化。

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaIrXOAfuIYAAqlLLZglRM512.pdf

2．基于遥感数据的不确定性的农业水资源优化配置研究——以漳河灌区为例

文献源：中国农业大学学报,2022-03-15

摘要：针对现有农业水资源优化配置存在的空间分辨率较大,忽略降雨量参数的时空变

异性,难以满足实际生产中更精确的管理要求的问题,以湖北省漳河灌区典型枯水年为例,采用基于遥感数据的水资源优化配置方法,分析全球降雨测量数据和多年雨量站站点数据关系,获取漳河灌区典型年空间降雨量数据集。在此基础上,将区间数、模糊区间数、模糊可信性约束规划以及作物水分生产函数耦合到一般非线性优化模型框架内,构建模糊区间可信性约束非线性规划模型,以经济效益为优化目标,对漳河灌区不同分灌区生育期内各个月的农业灌水量进行优化配置。优化结果表明:模型可以有效处理配置系统的复杂非线性、不确定性和违规风险问题,不同可信水平下的优化配水方案能够为灌区管理者提供丰富的决策指导,促进灌区农业水资源高效利用与精准管理。

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaIrqqAC_iOAAmEjFjLHlc251.pdf

3．阶段模型修正的星载GNSS-R土壤湿度反演方法

文献源：测绘学报,2022-03-15

摘要：本文提出了一种基于CYGNSS数据的星载GNSS-R土壤湿度反演方法。首先基于CYGNSS数据提取了地表反射率参数，联合SMAP数据中提取的植被光学厚度、地表粗糙度和温度等辅助信息，初步构建了土壤湿度反演理论模型，并利用神经网络模型确定了土壤湿度反演的精细数学模型；然后将该模型处理获得的土壤湿度以0.35cm^3/cm^{3}为分界点，利用本文提出的阶段函数模型处理提高反演精度，并使用2018年10月到2019年5月的CYGNSS数据，获得了全球范围内星载GNSS-R土壤湿度；最后通过与SMAP提供的土壤湿度数据对比评估了本文提出的星载GNSS-R土壤湿度反演方法的有效性，并对获取的星载GNSS-R土壤湿度进行了时间序列分析。结果表明，本文提出土壤湿度反演方法与SMAP土壤湿度具有良好的一致性，且随时间变化的趋势也相符合，为高精度土壤湿度反演提供了一种新思路。

链接:

http://agri.ckcest.cn/file1/M00/0F/F9/Csgk0GIx_TSAToHsABWlAhZYf4w442.pdf

4．基于改进型光谱指数的荒漠土壤水分遥感反演

文献源：自然资源遥感,2022-03-14

摘要：干旱地区土壤水分是影响气候动态变化、植被生态恢复和土地荒漠化治理的重要指示因子。本研究采用Landsat8 OLI/TIRS多光谱遥感影像,在9个传统光谱指数基础上引入热红外波段(b10)进行改进,通过显著性检验和多重共线性检验后的优选光谱指数作为本研究的建模因子,并结合地形数据采用多元线性回归（multivariable linear regression, MLR）和随机森林（random forest, RF）算法构建荒漠土壤水分综合反演模型,选取最优

模型分析土壤水分空间分布特征及驱动因素,结果表明:(1)改进后,光谱指数EBSI,ECI,ECaI,ENDVI和EPDI相关系数提升了0.02～0.11;(2)光谱指数经改进后,线性和非线性模型预测集R2分别提升了0.12和0.05,相对分析误差提升了0.35和0.49,其中,RF-II模型的相对分析误差高达3.12,能精准地对土壤水分进行预测;(3)非线性模型的精度明显优于线性模型,MLR线性模型预测集的R^2仅为0.59和0.71,而RF非线性模型预测集的R^2达到0.86和0.91;(4)土壤水分分布受到自然、人为2种驱动因素影响,东北部沙漠呈现[0,5)%和[5,12)%,南部农田交错分布,北部及中部荒漠-绿洲过渡带受植被覆盖程度和地表盐结皮抑制土壤水分蒸散困难,多呈现[15,20)%和[20,40)%。

链接:

http://agri.ckcest.cn/file1/M00/0F/F9/Csgk0GIx_miAfGYDABrtaiO-JFw765.pdf

5．缺测站干旱流域生态输水遥感监测与农业节水效益分析

文献源：干旱区地理,2022-03-12

摘要：生态输水与农业节水是实现内陆干旱流域可持续发展的重要手段，连续水文观测资料的缺乏制约了生态输水与农业节水效益评价。为此，以中国甘肃敦煌疏勒河流域下游为例，基于遥感水文站与谷歌地球引擎进行2016—2020年月尺度的生态输水遥感监测，在此基础上结合蒸散发和土地覆盖类型等多源遥感数据评价生态输水与农业节水效益，分析两者之间在水资源方面的平衡关系。结果表明：遥感水文站与谷歌地球引擎（GEE）能够提供为生态输水遥感监测与农业节水效益评价提供可靠的数据支撑；生态输水能够为下游湿地与河道平均每年提供2.50×10^8 m^3生态用水，且使下游河道周边植被恢复量达到了112.25 km^2；农业节水在保持耕地面积维持上升趋势的前提下，有效地降低耕地的蒸散发量0.395×108 $m^3 \cdot a^{-1}$；耕地蒸散发减少量平均占生态输水量的14.22%，农业节水有效缓解了内陆干旱流域农业用水挤占生态用水的问题。本文将为内陆干旱缺测站流域的生态输水遥感监测与农业节水效益评价提供新的思路，以期为未来的生态输水与农业节水工程的实施提供理论支撑。

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaIr5WAcD7gABYDwI5IQfU434.pdf

6．无人机高光谱波段选择的叶面积指数反演

文献源：光谱学与光谱分析,2022-03-09

摘要：叶面积指数（LAI）是评价作物长势和作物产量的重要参数。为有效利用高光谱信息,优选出最佳波段进而构建新型双波段指数来提高LAI估测精度,以冬小麦为研究对象,获取冬小麦孕穗期无人机高光谱数据和实测地面LAI数据,开展冬小麦LAI反演研究。首

先采用连续投影算法（SPA）、最佳指数法（OIF）以及逐波段组合法（E）分别进行无人机高光谱数据最佳波段筛选,进而将所选最佳波段构建新型双波段指数（VIOIF, VISPA, VIE）;然后将构建的新型双波段指数和常规双波段指数（VIF）与LAI进行相关性对比分析,最后结合支持向量回归（SVR）、偏最小二乘回归（PLSR）和随机森林回归模型（RFR）进行LAI估算,并对比分析常规双波段指数的估算精度,验证最佳波段选择方法构建新型双波段指数的最佳回归模型反演LAI的可行性。结果表明:（1）新构建双波段指数VIOIF, VISPA, VIE和VIF与冬小麦LAI的相关性均达到0.05的显著水平,其中VISPA和VIE与LAI的相关系数高于0.65,且RSISPA和RSIE与LAI的相关性较高（r>0.71）;（2）对比分析VIOIF、VISPA、VIE和VIF构建的SVR模型、PLSR模型和RFR模型的冬小麦LAI估测精度,VISPAPLSR模型估测精度最高,R^2和RMSE分别为0.75和0.90。该方法可为无人机高光谱数据波段选择以及冬小麦LAI反演提供技术支持和理论参考。

链接:

http://agri.ckcest.cn/file1/M00/0F/F9/Csgk0GIx_zeAamhwAA1GPNzPNHM959.pdf

7．基于深度学习与图像处理的蔬菜苗期杂草识别方法

文献源：吉林大学学报(工学版),2022-02-07

摘要：本研究以苗期青菜及其伴生杂草进行识别试验，提出了一种基于识别蔬菜进而间接识别杂草的独特方法，结合深度学习和图像处理技术，可以有效降低杂草识别的复杂度，同时提高识别的精度和鲁棒性。首先采用神经网络模型对青菜进行识别，并标记边框。对于青菜边框之外的绿色目标即视为杂草，利用颜色特征将其分割，并通过面积滤波得到滤除噪点后的杂草区域。为探究不同深度学习模型对青菜识别的效果，选取SSD模型、RetinaNet模型和FCOS模型，以F1值、平均精度和检测速度三个评价指标进行对比分析。SSD模型为青菜识别最优模型，拥有最高的检测速度和较优的识别率。其在测试集的F1值、平均精度和检测速度分别为95.4%、98.1%和31.0f/s。改进后的MExG因子能有效识别杂草，分割后的杂草形态完整且轮廓清晰。试验表明，本研究提出的蔬菜田杂草识别方法具有高度的可行性和极佳的应用效果，可为相似作物田杂草识别提供技术参考。

链接:

http://agri.ckcest.cn/file1/M00/0F/F9/Csgk0GIyAyyAKV1-ABX5CeW6Jaw350.pdf

8．基于双目视觉的田间作物高度和收割边界信息提取

文献源：农业机械学报,2022-01-27

摘要：为实现收获机无人驾驶自适应调控，提出一种基于双目视觉对田间作物高度和收

割边界信息进行提取的方法。利用双目相机获取三维数据，基于RANSAC算法拟合初始地面平面，结合IMU计算作业实时平面，根据点到平面的距离将三维数据转换为对应的实际高度。提出一种改进的结合密度峰聚类和K均值聚类的方法对高度数据分类，同时基于归一化彩色图像分割作物上部区域，融合高度分类和彩色图像分割结果，实现作物高度信息的提取。利用高度数据序列和模型函数的互相关性提取收割边界点，基于最小二乘法拟合边界直线，根据当前边界线预测下一帧数据边界点的候选范围，由收割边界直线计算航向偏差和横向偏差。实验表明，该方法可以有效提取作物高度和收割边界信息，高度检测平均绝对误差为0.043m，边界识别正确率93.30%，航向偏差平均角度误差为1.04°，横向偏差平均绝对误差为0.084m，对联合收获机无人驾驶自适应调控有应用价值。

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaItLWALPrrABTVMIEG-rU316.pdf

9．黄土高原植被作用下黄河数字流域模型坡面侵蚀模块改进

文献源：清华大学学报(自然科学版),2022-01-25

摘要：植被是影响坡面侵蚀的重要因素,如何在基于物理机制的侵蚀产沙过程中考虑植被作用仍是目前亟需解决的关键问题.该文基于土壤分离能力与泥沙输移能力双重限制的坡面侵蚀产沙机制,建立了考虑植被作用的坡面侵蚀模型.采用黄土高原典型流域径流小区数据对所建模型进行验证,结果表明:不同土地利用下该模型的决定系数为0.84～0.94,Nash-Sutcliffe有效系数为0.83～0.93,相对误差为-16.1%～14.2%.与黄河数字流域模型现有坡面侵蚀模块（决定系数0.01～0.51,Nash-Sutcliffe有效系数-74.45～0.48）相比,该文所建立的模型明显改善了不同土地利用和植被作用下的侵蚀产沙过程模拟,模拟产沙量的相对误差绝对值降低13%～96%,还具有与分布式流域水沙模型集成和应用的潜力.

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaItfGAcRTMABanxeJw0Zs798.pdf

10．遥感技术获取耕地质量评价指标的研究进展分析

文献源：农业机械学报,2022-01-25

摘要：耕地质量指标数据获取是耕地质量评价的基础,遥感为相关数据的快速、大面积获取提供了一种新的手段与方法。本文首先分析了耕地质量内涵和功能,在此基础上利用文献计量法对我国近5年耕地质量评价指标研究进行归纳,结合国外土壤质量的研究现状,提出了基于遥感技术的耕地质量评价指标体系,包括地形条件、土壤属性和田间利

用状况3个维度。然后分析了不同维度各指标获取方法的研究现状,概述了目前常用的遥感数据分析方法及对应的技术原理,遥感可有效获取田面坡度、田块状况、田间道路通达度、林网化程度等指标计算所需的基础数据,土壤属性的大尺度获取方法还需进一步研究。最后针对遥感技术获取耕地质量评价指标亟待解决的问题,提出了建议与展望:挖掘耕地质量评价指标的不同尺度遥感特征;加强耕地质量评价指标遥感信息的自动化提取研究;建设耕地质量评价的遥感大数据平台,促进遥感技术在耕地质量评价中的应用。

链接:

http://agri.ckcest.cn/file1/M00/0F/F9/Csgk0GIyBKyACFWYABRU8szXW6M855.pdf

【会议论文】

1. Big Data Fusion Challenge: Unmanned Aerial System Based Precision Agriculture

发布源：IEEE

发布时间：2022-08-27

摘 要： The International Conference of Computational Intelligence 2021 organized multi Remote Sensing Data Competitions, and a Big Data Fusion Challenge using UAS based precision Agriculture is coordinated by North Carolina A&T State University and Mississippi State University. The Big Data Challenge focused on Multi-sensor and Multitemporal datasets including the hyper spectral imagery with 251 bands. A multi-class problem is given to classify three different crops and at three yield levels. The challenge received multiple submissions and the winning approach is based on inference learning using residual neural networks with 150 layers with a performance of Kappa accuracy as 0.86.

链接:

http://agri.ckcest.cn/file1/M00/0F/F9/Csgk0GIzX4OAB20HAA3IriUrnq8957.pdf

2. Synergistic Use of TanDEM-X and Landsat-8 Data for Crop-Type Classification and Monitoring

发布源：IEEE

发布时间：2022-08-10

摘要： Classification of crop types using Earth Observation (EO) data is a challenging task. The challenge increases many folds when we have diverse crops within a resolution cell. In this regard, optical and Synthetic Aperture Radar (SAR) data provide complementary information to characterize a target. Therefore, we propose to leverage the synergy between multispectral and Synthetic Aperture Radar (SAR) data for crop classification. We

aim to use the newly developed model-free three-component scattering power components to quantify changes in scattering mechanisms at different phenological stages. By incorporating interferometric coherence information, we consider the morphological characteristics of the crops that are not available with only polarimetric information. We also utilize the reflectance values from Landsat-8 spectral bands as complementary biochemical information of crops. The classification accuracy is enhanced by using these two pieces of information combined using a neural network-based architecture with an attention mechanism. We utilize the time series dual co-polarimetric (i.e., HH-VV) TanDEM-X SAR data and the multispectral Landsat-8 data acquired over an agricultural area in Seville, Spain. The use of the proposed attention mechanism for fusing SAR and optical data shows a significant improvement in classification accuracy by 6.0% to 9.0% as compared to the sole use of either the optical or SAR data. Besides, we also demonstrate that the utilization of single-pass interferometric coherence maps in the fusion framework enhances the overall classification accuracy by ≈ 3.0%. Therefore, the proposed synergistic approach will facilitate accurate and robust crop mapping with high-resolution EO data at larger scales.

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaKDHiAe4F6AIg9jOXt8J0455.pdf

3．A physics-based algorithm to couple CYGNSS surface reflectivity and SMAP brightness temperature estimates for accurate soil moisture retrieval

发布源：IEEE

发布时间：2022-03-10

摘 要： Remotely sensed soil moisture (SM) with high accuracy and high spatial-temporal resolution is crucial to meteorological, agricultural, hydrological, and environmental applications. The Cyclone Global Navigation Satellite System (CYGNSS) is the first constellation that uses the L band signal transmitted by the GNSS satellites to develop daily SM data product. In this study, a physics-based algorithm is proposed to couple CYGNSS surface reflectivity (SR) and Soil Moisture Active and Passive (SMAP) brightness temperature estimates for accurate SM retrieval. The algorithm is based on the radiative transfer model and the SMAP data to derive a combined parameter of the vegetation optical depth (τ) and the surface roughness parameter (h). The CYGNSS L1 Version 2.1 data of the year 2017-2018 and 2019-2020 are used for calibration and validation, respectively. The SM

estimates agree and correlate well with the SMAP SM and in situ SM data on a global scale (R = 0.781, RMSE = 0.047 m3m-3, and MAE = 0.037 m3m-3 against SMAP SM; R = 0.755 against in situ SM). The proposed algorithm makes contributions from two aspects: 1) provides a physics-based algorithm using SMAP brightness temperature to calibrate the attenuation due to vegetation and surface roughness on the CYGNSS-derived SR. Unlike attenuation models that have been explored previously in the context of CYGNSS, this algorithm executes the calibration without relying on observations of h or vegetation biophysical parameters as inputs, but with the SMAP brightness temperature as the only observations; and 2) provides a new way for the combined usage of CYGNSS and SMAP to improve the temporal and spatial coverages of global SM, with temporal coverage increased by 38.2% and spatial coverage increased by 31.6%.

链接:

http://agri.ckcest.cn/file1/M00/0F/F9/Csgk0GIzXSaAPJEUACIDhls4BnU279.pdf

4．Validation of Soil Moisture Data Products From the NASA SMAP Mission

发布源：IEEE

发布时间：2021-12-31

摘 要： The National Aeronautics and Space Administration Soil Moisture Active Passive (SMAP) mission has been validating its soil moisture (SM) products since the start of data production on March 31, 2015. Prior to launch, the mission defined a set of criteria for core validation sites (CVS) that enable the testing of the key mission SM accuracy requirement (unbiased root-mean-square error <0.04 m 3 /m 3). The validation approach also includes other (“sparse network”) in situ SM measurements, satellite SM products, model-based SM products, and field experiments. Over the past six years, the SMAP SM products have been analyzed with respect to these reference data, and the analysis approaches themselves have been scrutinized in an effort to best understand the products’ performance. Validation of the most recent SMAP Level 2 and 3 SM retrieval products (R17000) shows that the L -band (1.4 GHz) radiometer-based SM record continues to meet mission requirements. The products are generally consistent with SM retrievals from the European Space Agency Soil Moisture Ocean Salinity mission, although there are differences in some regions. The high-resolution (3-km) SM retrieval product, generated by combining Copernicus Sentinel-1 data with SMAP observations, performs within expectations. Currently, however, there is limited availability of 3-km CVS data to support extensive validation at this spatial scale. The

most recent (version 5) SMAP Level 4 SM data assimilation product providing surface and root-zone SM with complete spatiotemporal coverage at 9-km resolution also meets performance requirements. The SMAP SM validation program will continue throughout the mission life; future plans include expanding it to forested and high-latitude regions.

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaKCqKALGkVAKdiptZqsB8356.pdf

5．Monitoring Barley Growth Condition with Multi-scale Remote Sensing Images

发布源：IEEE

发布时间：2021-09-08

摘要： Crop growth condition monitoring at regional scale with remote sensing data has been widely implemented. The normal method is extracting biophysical and biochemical parameters, and then setting thresholds for these parameters to grade different levels of crop growth. In which, as the parameters inversion has scale effects based on different remote sensing observations with different spatial scales, it is difficult to setting the threshold at multi-spatial scales. To achieve space consistency for multi-scale crop growth monitoring results, we constructed two new vegetation indexes for crop growth monitoring, and then proposed a new crop growth grading system. We constructed two new crop growth indicators, i.e., Crop Growth Monitoring Index 1 (CGMI1), and Crop Growth Monitoring Index 2 (CGMI2), based on Leaf Area Index (LAI) and Canopy Chlorophyll Density (CCD). Compared with the existed crop growth indicators, these two new growth indicators could provide a much more comprehensive description of the characteristics of crop growth status from the aspects of crop structure and biochemical conditions. To achieve the space consistency of crop growth monitoring, we constructed a new crop growth grading system based on multiple spatial resolution satellite images. Firstly, we proposed a spatial adaptive threshold selection method by integrating with data histogram and Gaussian distribution theory for thresholds selection based on the statistical analysis of CGMI1 and CGMI2, then to strengthen robustness of threshold selecting on multi-scale. Moreover, we carried out research on crop growth monitoring and ranking based on the selected thresholds of CGMI1 and CGMI2 from the aspects of crop canopy morphology structure (large, medium, and small) and crop canopy biological activity (strong, middle, and weak). Taking barley as our research object, three multi-source and multi-scale remote sensing images are obtained during the jointing-booting stage of barley, which include Advanced Land Observing

Satellite-Advanced Visible and Near Infrared Radiometer type 2 (ALOS-AVNIR2) image, Small Remote Sensing Satellite Constellations A StarCCD2 (HJ 1A-CCD2) image, and the 8-day composite MODIS Surface Reflectance Product (MOD09A1). Experimental numerical results showed better space consistency for crop growth monitoring based on multiple spatial scale dataset (ALOS, HJ, and MODIS). The new proposed crop growth indicators CGMI1 and CGMI2 based on LAI and CCD to both consider the crop morphology structure and biological activity. And the new growth grading rules provide a spatial adaptive threshold selection algorithm to keep the space consistency when mapping different crop growth grading. Theoretical analysis and numerical experiments fully confirmed the new system, not only effectively enhance the crop growth evaluation, but also revealing better results on the space consistency with multi-scale data.

链接:

http://agri.ckcest.cn/file1/M00/0F/F9/Csgk0GIzYm-AAP0fAAgsp5sp6lc069.pdf

6．Data Refinement Method of Sampling Sites for Remote Sensing Data

发布源：IEEE

发布时间：2021-09-08

摘要：To solve the spatial optimization of sampling sites in the process of remote sensing image classification, a data refinement method of sampling sites for remote sensing data was proposed in this study. Firstly, uniformity factor and uniformity curve were constructed to detect the uniformity of sampling sites in geographical space. According to the uniformity degree, the sampling sites were divided into uniform samples, aggregate samples and sparse samples. Secondly, the aggregate samples were deleted, and the sparse samples were matched in adjacent mode and separated mode. The sparse regions were supplemented, and the sampling layout was optimized by iterative sampling space optimization process. Finally, the sampling space optimization effects were evaluated based on the uniformity curve of sampling sites. The results showed that there were two aggregate samples and three sparse samples, and the uniformity factor was -1.70, -1.63, 0.99, 1.03, 1.15, respectively, and there were no aggregate samples and sparse samples after data refinement. The method developed in this study can realize the uniform and unbiased samples in geographical space and feature space, and provide theoretical support for the selection of sampling sites for remote sensing data.

链接:

http://agri.ckcest.cn/file1/M00/0F/F9/Csgk0GIzWoSAbDt_AAdldETy_IU107.pdf

7．Forecasting Wheat Yield Using Remote Sensing: The ARYA Forecasting System

发布源：IEEE

发布时间：2021-08-12

摘要：In this study we present a model to forecast wheat yield based on the evolution of the Difference Vegetation Index (DVI) and the Growing Degree Days (GDD), presented in Franch et al. (2015), but adapted to Franch et al. (2019) model. Additionally, we explore how the Land Surface Temperature (LST) can be included into the model and if this parameter adds any value to the model when combined with the optical information. This study is applied to MODIS data at 1km resolution to monitor the national and state level yield of winter wheat in the United States and Ukraine from 2001 to 2019.

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaKDwWAUMBbAAneku1_rjA527.pdf

8．Application of Internet of Things and Remote Sensing Development in Smart Rural Construction

发布源：IEEE

发布时间：2021-08-02

摘要：In a broad sense, the construction of smart villages includes the infrastructure layer and the smart application layer. The infrastructure layer should be the construction of power grid, followed by the construction of the Internet of Things and communication network, and finally the construction of the corresponding data platform. The construction of the smart application layer consists of five smart application layers: ecology, industry, governance, local customs and people's livelihood. In this paper, feature points are extracted and matched, and then the image of the test area is obtained by iterative Mosaic of the overall optimization. Experimental results show that the average detection accuracy of Faster R-CNN on UAV remote sensing images reaches 90.29%, which can meet the detection requirements.

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaKF22ACF5bAAf5nYj-NvI134.pdf

9．Establishment of a Comprehensive Drought Monitoring Index Based on Multisource

Remote Sensing Data and Agricultural Drought Monitoring

发布源：IEEE

发布时间：2021-01-15

摘要：The occurrence of drought is a complex process and is caused by the interaction of multiple drought-causing factors. The construction of traditional drought models and indexes seldom considers multiple drought-causing factors. This study integrated the precipitation, soil water and heat balance, and crop growth during drought. From the beginning of the process of agricultural drought, the atmosphere, soil, and crops that characterize drought are considered, through the principal component analysis method to construct a comprehensive drought monitoring index (CDMI). This index was verified by using the areas covered by drought, areas affected by drought, relative soil moisture, and crop yield. The annual average CDMI had negative correlations with areas covered and affected by drought. The correlation coefficients were 0.68 and 0.73. Moreover, the CDMI value had positive correlations with relative soil moisture and crop yield. The maximum correlation coefficient between CDMI and relative soil moisture was 0.91, and the correlation coefficient with maize yield was 0.52. Subsequently, the CDMI was applied to long-term drought monitoring in agricultural areas during the summer maize growing season (June to September) in Henan Province. Results showed that the most severe years of agricultural drought in Henan Province were 2000, 2001, 2004, 2006, 2008, and 2014. The most severe agricultural drought occurred in July and August 2014. Statistics found that Henan Province had high frequencies of severe drought. This study proved that CDMI calculated by multisource remote sensing data is a reliable and effective indicator for monitoring and assessing agricultural drought.

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaKEfuAP0pdAFA2wEmudiY838.pdf

【专业会议】

1．The 2nd International Conference on Computer, Remote Sensing and Aerospace（CRSA 2022）

发布源：AEIC

发布时间：2022-03-16

摘要： The 2nd International Conference on Computers, Remote Sensing and Aerospace (CRSA 2022) will be held in Nagoya, Japan, from August 26-28, 2022. This conference mainly focuses on the latest research on "information science" and "artificial intelligence", and

aims to gather experts, scholars, researchers and related practitioners in this field from all over the world to share research results, explore hot issues, and exchange new ideas, experience and technology. We warmly welcome experts and scholars in related fields to submit their new research or technical contributions to CRSA 2022, and share valuable experiences with scientists and scholars from all over the world.

链接:

http://agri.ckcest.cn/file1/M00/03/27/Csgk0YaImzuAXcq0ABl3A1xXmhk097.pdf

2．2022 IEEE 3rd International Conference on Geology, Mapping and Remote Sensing (IEEE-ICGMRS 2022)

发布源：IEEE

发布时间：2022-03-16

摘要：Climate change is an issue that needs to be faced by all humankind globally, and the resulting extreme weather events are becoming more and more frequent, with increasingly serious impacts. The Government's report in 2021 clearly states that "we will do a good job in achieving carbon peaks and carbon neutrality". 2022 3rd International Conference on Geology, Mapping and Remote Sensing (ICGMRS 2022) will be held in Zhoushan, Zhejiang Province, on April 22 - 24, 2022 to exchange the latest progress in theory, technology and application in the fields of geology, mapping and remote sensing, and to showcase the latest achievements and promote the medium-term goals and visions of addressing climate change. The theme of ICGMRS 2022 conference is "Application of New Technologies in Geology, Mapping, Remote Sensing and Marine Communication under Carbon Neutral Goals". The International Conference on Geology, Mapping and Remote Sensing has been successfully held twice since 2020, both of which were initiated and held by the AEIC Academic Exchange Information Center. As the third session will be held in 2022, ICGMRS 2022 is to bring together innovative academics and industrial experts in the field of geology, mapping and remote sensing to a common conference. The primary goal of the conference is to promote research and developmental activities in geology, mapping and remote sensing and another goal is to promote scientific information interchange between researchers, developers, engineers, students, and practitioners working all around the world. Welcome to contribute papers and attend the online conference!

链接:

http://agri.ckcest.cn/file1/M00/0F/F9/Csgk0GIx4t2AXVPbABPRCVR-YuM719.pdf

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