中国工程科技知识中心
China Knowledge Centre for Engineering Sciences and Technology

《智慧农业发展战略研究》专题快报

2021年第8期（总第45期）

中国工程科技知识中心农业分中心

中国农业科学院农业信息研究所 2021年4月20日

【动态资讯】

1．科学数据支撑黄河流域高质量发展

【中国农业科学院】4月14日，国家科学数据中心支撑黄河流域高质量发展需求研讨会在郑州召开。由国家农业科学数据中心联合国家地球科学数据中心、国家林业与草原科学数据中心组成的联合调研组，与来自河南省科学技术发展战略研究所、中国农业科学院农田灌溉研究所等单位的领导和专家，就黄河流域高质量发展进行深入研讨。会议充分肯定了河南省围绕黄河流域高质量发展开展的相关工作，指出河南省相关课题组与国家数据中心进行深度合作，上下联动，在数据的个性化、定制化服务方面进行了有益的探索。下一步，国家科学数据中心将为黄河流域高质量发展开辟绿色通道，提供高质量数据支撑，细化选题，编制战略分析报告，进行深度合作，支撑黄河流域高质量发展。

链接:

http://agri.ckcest.cn/file1/M00/02/AF/Csgk0WB9cVKAZHkNAALpLQs4KMc097.pdf

2．农业农村部部署加快推进“互联网+”农产品 出村进城工程试点工作

【农业农村部】4月9日，农业农村部在京召开视频会议，对加快推进“互联网+”农产品出村进城试点工作进行部署。农业农村部副部长于康震出席会议并讲话。会议指出，“互联网+”农产品出村进城试点工程指导意见以及试点方案印发后，各地都高度重视，积极响应，结合实际，扎实推动，探索出了一些发展模式和典型案例，总结出了一些好经验好做法，呈现出良好态势。会议强调，出村进城工程关键是建立适应农产品网络销售的供应链体系，建立市场与生产的联动反馈机制，把庞大的市场需求内化为本地产业升级的动力。下一步要重点抓好四方面工作。一是抓统筹，要制定工作计划和工作台账，建立试点工作协调机制，把各相关部门力量凝聚起来，扎实推进试点建设。二是抓市场，要充分调动企业积极性，营造市场投资环境，形成良性发展。三是抓重点，要把培育产

业化运营主体作为关键，依托产业化运营主体打通全产业链各环节，促进产业升级。四是抓落实，要加强督促考核，确保试点工作按期保质完成。福建、江苏农业农村厅负责人，浙江省衢州市柯城区、四川省汉源县政府负责人及部分企业代表在会上作典型发言。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9cJ6AdGWsABjoUSaY1xE701.pdf

【文献速递】

1．信息技术与智能装备助力智能设计育种

文献源：吉林农业大学学报,2021-04-13

摘要：当前，世界种业已进入空前的密集创新和产业变革时代，作物育种正迎来以信息技术和生物技术融合发展为标志的新一轮科技革命，并将引领种业进入智慧种业时代。为此，抢占农业智能设计育种技术及其产业发展的制高点已成为世界各国增强国际竞争力的重大战略。本文回顾了作物主要育种技术及模式的发展历程，总结了智能设计育种的含义和基本流程，论述了信息技术与智能装备在智能设计育种中的主要作用，包括表型-环境大数据获取解析、多重组学大数据分析、多维大数据驱动的智能育种预测模型构建、育种大数据存储管理与应用以及育种装备的机械化、自动化和智能化方面的内容；最后从信息技术和智能装备视角探讨了当前作物智能设计育种面临的主要问题与挑战，并从加速作物表型组技术体系构建、加快育种大数据建设、加强生物技术和信息技术的深度融合、务实推进种业智能装备自主研发和开展智能设计育种大联合大协作五个方面提出了具体建议。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9aDaAdpXsABAVl_KMwD0516.pdf

2．基于小波分析的马铃薯地上生物量估算

文献源：光谱学与光谱分析,2021-04-08

摘要：地上生物量（AGB）是作物长势评价及产量预测的重要指标,因此快速准确地估算AGB至关重要。由于传统植被指数（VIs）估算多生育期的AGB存在饱和现象,因此,利用VIs结合基于离散小波转换（DWT）的影像小波分解（IWD）技术提取的高频信息和连续小波转换（CWT）技术提取的小波系数,探究VIs,VIs+IWD和VIs+CWT对于AGB的估算能力。首先,基于无人机平台分别获取马铃薯现蕾期、块茎形成期、块茎增长期、淀粉积累期的数码影像和成像高光谱影像以及地面实测的AGB数据。其次,利用数码影像通过IWD技术提取3种高频信息和利用高光谱反射率数据通过CWT技术提取小波系数以及构建6种高光谱植被指数。然后,将植被指数、高频信息和小波系数分别与AGB进行相关性分析,

并挑选出不同尺度下相关系数绝对值较高的前10波段。最后,以VIs,VIs+IWD和VIs+CWT这3种变量分别使用偏最小二乘回归（PLSR）方法构建AGB估算模型,并对比不同模型估算AGB的效果。结果表明:（1）每个生育期选取的6种植被指数、3种高频信息和10种小波系数与AGB的相关性均达到0.01显著水平,整个生育期相关性均呈现先升高后降低的趋势,其中以小波系数得到的相关性最高、高频信息次之,植被指数最低。（2）对比分析每个生育期的3种估算模型,以VIs+CWT为输入变量的估算效果最好,VIs+IWD的估算效果次之,而VIs的估算效果最差,说明基于小波分析构建的模型适用性较广、稳定性较强。（3）每个生育期分别以3种变量利用PLSR方法构建的AGB估算模型均在块茎增长期达到最高精度 (VIs: 建模 R^2=0.70,RMSE=98.88kg·hm^{-12},NRMSE=11.63%; VIs+IWD: 建模 R^2=0.78, RMSE=86.45kg·hm^{-12}, NRMSE=10.17%; VIs+CWT: 建模 R^2=0.85, RMSE=74.25kg·hm^{-12}, NRMSE=9.27%)。通过VIs分别结合IWD和CWT技术利用PLSR建模方法,可以提高AGB估算精度,为农业指导管理提供可靠参考。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9ZuyAXGldACz7YW0pUKc083.pdf

3．奶牛反刍行为的智能化监测方法及其应用研究进展

文献源：中国饲料,2021-04-05

摘要：奶牛养殖业是我国国民经济的重要组成部分。如今,传统养殖模式已不能满足现代化养殖需求,以信息技术为支撑的精细化养殖成为未来发展的趋势。奶牛的反刍行为与生产性能、繁殖性能、应激反应以及疾病等因素密切相关,监测奶牛个体反刍行为能够及时掌握其健康状况,对于提高奶牛养殖水平起着至关重要的作用。本文从奶牛反刍行为的定义、反刍行为监测内容、智能化监测方法及其应用三个方面进行综述,以期为奶牛反刍行为监测的应用提供理论依据。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9XkyAOC6hAAsxDpatseM936.pdf

4．基于面向对象结合随机森林模型的 Sentinel-2A影像耕地信息提取

文献源：河南理工大学学报(自然科学版),2021-03-29

摘要：耕地资源是我们赖以生存的物质保障，统计耕地的数量、位置是农业发展研究的重要课题。近年来随着遥感影像分辨能力的提高，使得耕地的分类型提取成为可能。以山东省青岛市莱西市夏格庄镇为研究区，以Sentinel-2A影像为数据源，融合光谱特征、遥感指数特征、纹理特征和形状特征等31个特征变量，设计4种耕地信息提取方案，采用结合面向对象的随机森林（Random Forest， RF）分类模型提取耕地信息。最后，基

于相同的分类条件，与传统机器学习分类方法进行对比试验，评价模型的优适性。结果表明：结合所有分类特征变量的方案4，耕地提取效果最佳，其中旱地提取精度高达99.6%，大棚提取精度达88.4%；5种分类方法中，结合面向对象的RF模型耕地提取精度最高，减弱了分类结果的“椒盐”现象，优化了分类结果。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9Z1CATTtMAA_OuWSDpBg263.pdf

5．Digital image analysis estimates of biomass, carbon, and nitrogen uptake of winter cereal cover crops

文献源：Computers and Electronics in Agriculture,2021-03-27

摘要：Over-wintering cereal cover crops contribute to greater cropping system sustainability by reducing risk of erosion, adding carbon (C), and sequestering inorganic nitrogen (N) between fall harvest and spring planting of annual crops. Carbon and N pools can be measured by manual sampling and laboratory analysis of roots and shoots. However, this is expensive and unscalable to field levels. This study aimed to (1) determine relationships between shoot biomass and total biomass, C and N uptake of winter wheat (Triticum aestivum L.), cereal rye (Secale cereale L.), and triticale (X Triticosecale Wittm.); and (2) develop models to estimate shoot biomass using green cover (%) from digital images. Shoot and root biomass, C, and N uptake of cover cropped fields were determined by destructive sampling within rectangular quadrats (97.8 × 20.3 cm) in fall 2011 prior to snowfall (58 fields) and spring 2012 prior to termination (30 fields). In addition, shoot biomass and digital images (top view of crop canopy taken at shoulder height) were collected in fall 2013 and spring 20122014 (266 quadrats) using four different cameras (Canon, Nikon, Apple iPhone, Motorola Droid) for a total of 589 images. Four approaches were evaluated to estimate green cover: (i) estimation from “Canopeo” software; (ii) RGB color space with a set cutoff; (iii) the Lab color space with fixed adjustment of the “a” channel per camera; and (iv) the Otsu thresholding method applied to the “a” channel of the Lab color space. Shoot biomass ranged from 37 to 2657 kg DM ha−1 and was linearly correlated with total biomass (R^2 = 0.99), total C (R^2 = 0.99), and total N (R^2 = 0.92), independent of species or season. The Otsu method best estimated shoot biomass from green cover (R^2 = 0.66; green cover ranging from 10 to 70%). This method also reduced differences among cameras and the influence of lighting conditions on green cover estimations. Exponential models for shoot biomass estimation from green cover (%) determined with the Otsu method had the highest R^2 for

cereal rye (R^2 = 0.79), followed by triticale (R^2 = 0.54), and wheat (R^2 = 0.52). We conclude these models, combined with linear equations to predict total biomass, C, and N uptake from shoot biomass can be used to estimate the same from imagery. Additional research is needed to validate models across more locations, different growth stages, and to expand across a larger range of green coverage.

链接:

http://agri.ckcest.cn/file1/M00/02/AF/Csgk0WB9fUiAahDXAL4ZUxj8HL0662.pdf

6．基于增量式PID算法的多种固体肥精确施控系统研究

文献源：农业机械学报,2021-03-25

摘要：为了实现变量施肥过程中多种固体肥的实时自动配比、提高施肥控制系统的排肥量控制准确率,采用增量式PID闭环控制算法设计基于测土配方的多种固体肥精确施肥控制系统及与之配套的施肥装置,实现了氮、磷、钾3种固体肥的适时快速响应和实时精量施入。施肥控制系统主要包括主-从控制器模块、处方图模块、北斗卫星定位模块、测速模块、人机交互模块、施控电机模块和施肥量监测模块等。主控制器主要完成人机交互指令接收、北斗卫星定位信息获取、处方图施肥量查询、车速和施控电机的工作状态监测、从控制器工作指令下达等任务,人机交互模块实现主控制器和手机APP的通信;从控制器主要实现主控制器指令接收和施控电机工作控制。根据播种环节普遍采用中小型播种机的实际情况,模拟播种施肥机具行进速度为3.5～6.5 km/h,进行了实验室单一肥料排肥试验,试验表明,控制系统最大响应时间1.85 s,平均响应时间1.45 s。在设定施肥量50、100、200、300 kg/hm²下,模拟行进速度为4、5、6 km/h时,控制系统的排肥量准确率达97.16%,监测准确率98.56%。进行了田间试验,制作了哈尔滨市双城区东海村测土配方施肥的处方图,在车速为4、5、6 km/h时,尿素、磷酸二铵、硫酸钾的排肥量准确率分别达97.22%、98.60%和97.73%,满足精确施肥系统的施肥精度要求。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9XrWAbOD9AEhWx5fLo8U407.pdf

7．A study on the use of UAV images to improve the separation accuracy of agricultural land areas

文献源：Computers and Electronics in Agriculture,2021-03-23

摘 要： Classifying satellite images with medium spatial resolution such as Landsat, it is usually difficult to distinguish between plant species, and it is impossible to determine the area covered with weeds. In this study, a Landsat 8 image along with UAV images utilized to separate pistachio cultivars and separate weed from trees. To use the high spatial resolution of UAV images, image fusion was carried out through the high-pass filter, wavelet, principal component transformation, BROVEY, IHS, and Gram Schmidt methods. ERGAS, RMSE, and correlation criteria were applied to assess their accuracy. The results represented that the wavelet method with R^2, RMSE, and ERGAS 0.91, 12.22 cm, and 2.05 respectively had the highest accuracy in combining these images. Then, images obtained by this method were chosen with a spatial resolution of 20 cm for classification. Different classification methods including unsupervised method, maximum likelihood, minimum distance, fuzzy artmap, perceptron, and tree methods were evaluated. Moreover, six soil classes, Ahmad Aghaei, Akbari, Kalleh Ghoochi, Fandoghi, and a mixing class of Kalleh Ghoochi and Fandoghi were applied, and also three classes of soil, pistachio tree and weeds were extracted from the trees. The results demonstrated that the fuzzy artmap method had the highest accuracy in separating weeds from trees, differentiating various pistachio cultivars with Landsat image and also classification with combined image and had 0.87, 0.79, and 0.87 kappa coefficients respectively. The comparison between pistachio cultivars through Landsat image and the combined image showed that the validation accuracy obtained from harvest has raised by 17% because of the combination of images. The results of this study indicated that the combination of UAV and Landsat 8 images affects well to separate pistachio cultivars and determine the area covered with weeds.

链接:

http://agri.ckcest.cn/file1/M00/02/AF/Csgk0WB9eX2AL56zAUiblFp9Chs775.pdf

8．基于激光传感器的播种参数监测方法

文献源：农业工程学报,2021-02-28

摘要：目前玉米播种参数监测多采用红外光电监测的方式,易受灰尘和落种碰撞影响,且传感器安装在导种管的上部,双粒重叠种子在上部无法分开进而导致传感器计为单粒种子,计数准确率下降。针对以上问题,该研究提出一种基于激光传感器的播种参数监测方法。该方法以激光传感器为信号捕获源,采用单片机为主控制器,将传感器安装在导种管底端,实现对播种量、合格率、漏播率、重播率等参数的实时监控。抗灰尘模拟试验表明:采用激光监测的方法传感器能够在灰尘较大的工作条件下正常工作。在穿透透明物体的状态下播种数量监测平均相对误差不大于1.15%,合格率、漏播率、重播率监测平均绝对误差低于0.5个百分点。安装在导种管底端的激光传感器对从排种口排出的双粒重叠种子监测的准确率达到95.4%,而安装在导种管上部的红外传感器监测准确率低于

7.0%。结果表明采用激光监测的方法具有可靠的工作性能,满足实际播种参数监测的需要。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9aVOAbTuaADI26YGTZDw338.pdf

9．基于VIS-NIR的播种沟内土壤水分测量传感器研究

文献源：农业机械学报,2021-02-25

摘要：基于土壤水分的播深调整技术,需要对播种沟土壤水分进行测量,以便根据落种点处的土壤水分信息进行播种调节,改变播种策略。本文设计了一种可见光-近红外（Visible and near-infrared,VIS-NIR）式土壤水分传感器。使用高分辨率光谱仪采集不同水分梯度的土壤光谱数据,采用偏最小二乘回归法（Partial least squares regression,PLSR）进行建模分析,并结合多种数据降维方法进行变量筛选,得出不同土壤含水率的敏感波段分别在410、540、780、970 nm附近;通过对这4种波长进行组合建模分析,选择得出预测最优的VIS和NIR波长组合为410 nm和970 nm。采用这两种波长设计传感器,并进行实验室试验,结果表明:当传感器与被测土壤表面距离d较近时（0～3 mm）,测量精度和稳定性最好;当d为0～3 mm、土壤质量含水率处于0.69%～28.45%时,真实值与预测值之间决定系数R^2达到0.81,均方根误差（RMSE）为2.90%;当土壤质量含水率处于0.69%～22%时,真实值与预测值之间R2提高至0.93,此时均方根误差降低为1.72%。通过析因试验得出,在显著性水平为0.05时,温度与光照强度对传感器正常工作没有明显影响。土槽试验表明,真实值与预测值之间R2为0.82,RMSE为1.23%,满足玉米等作物播种环节土壤水分的测量要求。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9aL-Abs95AAvkI4S6nwk513.pdf

10．遥感在森林精准培育中的应用现状与展望

文献源：遥感学报,2021-01-25

摘要：随着社会经济快速发展及人口增长,中国木材供需矛盾突出,对外依存度高。面对有限的土地资源,迫切需要更为高效、高质量地培育森林资源,在定向培育和集约经营等的各个环节实现培育技术精准化。现代遥感技术所构建的多平台、多角度、多模式立体观测体系及定量分析方法是森林精准培育的关键技术。以遥感技术为核心所构建的从土壤类型分析、土地适应性评价、生态环境模拟到林木育种、灌溉施肥、林木长势监测、病虫害防治等一体化、精准化的森林精准培育新体系,将全面支撑现代林业的整体提质增效和森林质量精准提升。本文首先介绍了RGB相机、多光谱、高光谱、激光雷达、热红外和荧光传感器在森林精准培育中应用现状,并对其应用特点及测量指标进行了综合

比较;然后,重点介绍了遥感在林木良种选育、营养胁迫监测诊断及水肥精准喷灌以及森林病虫害防治与健康评估这3个森林精准培育重要方向上的应用,并分析了各应用方向的共性需求;最后,从3个方面,即多源遥感信息融合,人工智能、物联网及3S技术集成,以及遥感数据与生理生态模型和辐射传输模型等的集成应用,分析了未来遥感技术在森林精准培育中的发展趋势及应用前景。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9ajOAQ6DIABwz0sNd-ns544.pdf

【会议论文】

1．AgriSegNet: Deep Aerial Semantic Segmentation Framework for IoT-assisted Precision Agriculture

发布源：IEEE

发布时间：2021-04-05

摘要：Aerial inspection of agricultural regions can provide crucial information to safeguard from numerous obstacles to efficient farming. Farmland anomalies such as standing water, weed clusters, hamper the farming practices, which causes improper use of farm area and disrupts agricultural planning. Monitoring of farmland and crops through Internet-of-Things (IoT)-enabled smart systems has potential to increase the efficiency of modern farming techniques. Unmanned Aerial Vehicle (UAV)-based remote sensing is a powerful technique to acquire farmland images on a large scale. Visual data analytics for automatic pattern recognition from the collected data is useful for developing Artificial intelligence (AI)-assisted farming models, which holds great promise in improving the farming outputs by capturing the crop patterns, farmland anomalies and providing predictive solutions to the inherent challenges faced by farmers. In this work, we propose a deep learning framework AgriSegNet for automatic detection of farmland anomalies using multiscale attention semantic segmentation of UAV acquired images. The proposed model is useful for monitoring of farmland and crops to increase the efficiency of precision farming techniques.

链接:

http://agri.ckcest.cn/file1/M00/02/AF/Csgk0WB9m-uAQisRADegq-6gL54662.pdf

2．Unmanned Aerial Vehicles in Smart Agriculture: Applications, Requirements, and Challenges

发布源：IEEE

发布时间：2021-01-06

摘要：In the next few years, smart farming will reach each and every nook of the world. The prospects of using unmanned aerial vehicles (UAV) for smart farming are immense. However, the cost and the ease in controlling UAVs for smart farming might play an important role for motivating farmers to use UAVs in farming. Mostly, UAVs are controlled by remote controllers using radio waves. There are several technologies such as Wi-Fi or ZigBee that are also used for controlling UAVs. However, Smart Bluetooth (also referred to as Bluetooth Low Energy) is a wireless technology used to transfer data over short distances. Smart Bluetooth is cheaper than other technologies and has the advantage of being available on every smart phone. Farmers can use any smart phone to operate their respective UAVs along with Bluetooth Smart enabled agricultural sensors in the future. However, certain requirements and challenges need to be addressed before UAVs can be operated for smart agriculture-related applications. Hence, in this article, an attempt has been made to explore the types of sensors suitable for smart farming, potential requirements and challenges for operating UAVs in smart agriculture. We have also identified the future applications of using UAVs in smart farming.

链接:

http://agri.ckcest.cn/file1/M00/02/AF/Csgk0WB9my2ASE22AAxi0ujIoTE109.pdf

【相关专利】

1．一种智慧农业水培管理系统

发布源：国家知识产权局

发布时间：2021-03-30

摘要：本发明公开了一种智慧农业水培管理系统，包括水培架和收获系统；所述的水培架包括水培管、水培液自动补充装置、出水口、出水口拉环、第一传送带、种植孔、第一滑轮组、激光开关支架、激光开关、割刀、割刀支架；所述的水培管为顶部开放的可盛液体的管道，具体形状和大小可根据需要自行设计；所述的收获系统包括第二传送带、收获系统支架、收获系统支架滑轮组；所述的第二传送带围绕在收获系统支架滑轮组外侧，在收获系统支架滑轮组带动下，围绕收获系统支架转动；整套智慧农业水培管理系统可以大大提高现代农业温室水培作业的工作效率，节省人工和能源。

链接:

http://agri.ckcest.cn/file1/M00/02/AF/Csgk0WB-NTOAA0yWAApsoXK07_4323.pdf

2．一种自走式莲藕收获作业船

发布源：国家知识产权局

发布时间：2021-03-30

摘要：本实用新型公开了一种自走式莲藕收获作业船,船体用于承载挖掘机构和各种工作装置；行走装置包括明轮和三角履带,分别用于在水面和陆地行走和提供动力,三角履带使船体在路面上行走,方便上下田埂,明轮用于在水中辅助船体前进和停止,抓斗采用反铲镂空抓斗,用于挖掘并过滤泥土。船体内有完善的液压系统,液压驱动挖藕船上各执行机构上的液压缸进行作业；工作时,液压油缸插入泥面,抓斗将莲藕采出放在挖掘工作后的水面上。本实用新型设置了一种挖掘机构与船体结合的莲藕收获作业船,是一种切实可行的莲藕收获作业船,能适应多种田间条件作业,高效将莲藕采出。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9bxGAao6TAAho4hHBkhg018.pdf

3．一种多功能有机肥撒肥机

发布源：国家知识产权局

发布时间：2021-03-26

摘要：本发明公开一种多功能有机肥撒肥机，包括机架、并排设置于机架上的肥箱和发动机、以及设置于机架下方的行走机构；所述行走机构包括机架安装座和履带轮，机架安装座设置于履带轮上方；肥箱的前端设有铲斗，肥箱的后端底部连接有撒肥圆盘，肥箱内底部设有链板输肥机构，链板输肥机构沿肥箱轴向设置从肥箱前端延伸至肥箱后端且位于撒肥圆盘上方；通过发动机控制液压泵驱动第二液压杆，进而控制肥箱从机架安装座上抬升和复位；所述铲斗通过多连杆翻转机构与肥箱相连，通过控制手柄来控制多连杆翻转机构和铲斗翻转。本发明的有机肥撒肥机结构精巧，体积小动力大，既能够上肥又可以精准定量撒肥，并且不仅能撒有机肥，还可以精量撒施化学肥料。

链接:

http://agri.ckcest.cn/file1/M00/02/AE/Csgk0WB9bj6AULr7AAoZ4yLM4FQ433.pdf

【专业会议】

1．数字乡村与智慧农业研讨会在京召开

发布源：中国农网

发布时间：2021-04-15

摘要：近日，由中国农业风险管理研究会举办的“数字乡村与智慧农业研讨会”在北京举行。会议就如何通过数字赋能农业和农村，推动数字技术和农业生产经营深度融合、深

度挖掘农业农村海量的数据资源与数据需求，以及扩展农业监测、风险管理、金融服务、市场流通等领域数字应用，打造具有竞争力的乡村数字产业集群，缩小城乡发展鸿沟、促进城乡融合发展等议题进行了研讨交流。国务院参事、清华大学信息科学技术学院院长、中国工程院院士戴琼海教授指出，农业智能化需要高效算法、强劲算力、人性交互支撑。要加快光电芯片研发，突破硅基芯片和人工智能能耗发展瓶颈，推动原创技术产业化应用，用强劲算力满足智慧农业的数字需求。国家农业信息化工程中心主任、中国工程院院士赵春江表示，智慧农业是多技术集成，目前在全产业链应用成本过高，要抓关键环节，把技术的边际效应发挥出来。新疆重点推广北斗导航应用、黑龙江中的概念推广水稻测深施肥加上北斗导航、中华联合保险的农业保险理赔，效益非常明显；要围绕关键技术开展创新研发，比如传感器、农机测控单元EUC、算法等。加强智慧农业、数字乡村建设标准制订。

链接:

http://agri.ckcest.cn/file1/M00/02/AF/Csgk0WB9dK6AdkDlAAz80NizABg871.pdf

2．“2021数字乡村论坛”将在河南郑州举办

发布源：中国农网

发布时间：2021-04-13

摘要：此次论坛以“发展数字农业，建设数字乡村”为主题，主要活动内容包括：开幕式和主论坛；数字农业，5G、新基建与数字乡村建设，农村电商，普惠金融与数字乡村建设和农业智能装备与数字乡村建设等5个专业论坛；数字乡村技术、应用和产品的成果展示。论坛举办期间，多位院士和行业领袖将作主旨演讲，信息化头部企业高管与国内行业顶级专家高端对话，并举办河南省数字乡村发展联盟成立揭牌仪式，同时发布一批数字乡村建设新技术、新产品、新应用优秀方案及案例。

链接:

http://agri.ckcest.cn/file1/M00/02/AF/Csgk0WB9dTqAFr6CAAzG0MtPnxU306.pdf

3．2021 2nd International Conference on Internet of Things, Artificial Intelligence and Mechanical Automation

发布源：GSRA

发布时间：2021-04-01

摘要：The previous First International Conference on Internet of Things, Artificial Intelligence and Mechanical Automation (IoTAIMA 2020) was successfully taken place on July 10-12, 2020 in Hangzhou, China. All accepted papers has been published by Journal of

Physics: Conference Series and has been indexed by EI Compendex and Scopus. It's our great pleasure to invite you to join us for the 2021 2nd International Conference on Internet of Things, Artificial Intelligence and Mechanical Automation (IoTAIMA 2021), which will be held on May 14-16, 2021 in Hangzhou, China. IoTAIMA 2021 will provide a forum within the international academic and engineering community in the field of Internet of Things, Artificial Intelligence and Mechanical Automation. The annually-held IoTAIMA conference aims to gather professors, researchers, scholars and industrial pioneers all over the world. IoTAIMA is the premier forum for the presentation and exchange of past experiences and new advances and research results in the field of theoretical and industrial experience. The conference welcomes contributions which promote the exchange of ideas and rational discourse between educators and researchers all over the world. The organizing committee of conference is pleased to invite prospective authors to submit their original manuscripts to IoTAIMA 2021.

链接:

http://agri.ckcest.cn/file1/M00/02/AF/Csgk0WB9kFeAUI4gAAnQ_WznRKg445.pdf

4．2021 International Conference on Sensing Technology and Applications（ICSTA 2021）

发布源：AEIC学术交流中心

发布时间：2021-04-01

摘要：The 2021 International Conference on Sensing Technology and Applications（ICSTA 2021）will be held on April 23 to 25, 2021 in Chengdu China. The meeting focused on the research fields of "Sensing Technology" and "Sensing Applications". The aim is to provide a common forum for researchers, scientists, engineers and practitioners throughout the world to present their latest research findings, ideas, developments and applications in the area of sensing technology, to explore the development path of ecological civilization construction, and to cope with new opportunities and challenges.

链接:

http://agri.ckcest.cn/file1/M00/02/AF/Csgk0WB9j16ANpPwAA-JBiJNWLw185.pdf

主编：赵瑞雪 本期编辑：陈亚东
地址：北京市海淀区中关村南大街12号 邮编：100081
电话：010-82106649 邮件地址：agri@ckcest.cn