中国工程科技知识中心
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《智慧农业发展战略研究》专题快报

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中国工程科技知识中心农业分中心

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【动态资讯】

1．聚智强“芯”稳产保供——看全国畜牧总站2021年如何推动畜牧业高质量发展

【农民日报】2021年3月初，春寒料峭，宁夏石嘴山市大武口区龙泉村却很是热闹，农业农村部文化科技卫生“三下乡”活动正如火如荼，发图书、发挂图、发牧草种子，来自全国畜牧总站的专家和技术人员现场开展畜牧业技术咨询服务，面对面解答农牧民的问题，宣传畜牧产业政策，普及奶牛、肉牛、肉羊养殖知识，推广全株玉米种植和加工利用等技术，受到农牧民的热烈欢迎。策划线下线上多主题培训，召开多产业发展形势研讨，牵头组织畜禽遗传资源面上普查，编制组织实施新一轮国家畜禽遗传改良计划，推动制定奶业、饲草产业发展规划及百余项国家标准和行业标准，开展玉米豆粕减量替代关键技术集成与示范推广，组建山南、那曲、阿里畜牧业技术服务团……2021年，作为畜牧业技术推广的“国家队”，畜牧业管理的国家级“智库”，全国畜牧总站带领全国省、市、县、乡（镇）四级畜牧技术推广机构，聚焦畜禽产品稳产保供，发力做强畜禽种业“芯片”，加快推进现代畜牧业高质量发展，做好技术支撑和服务保障，当好行业行政管理部门的参谋助手，示范推广先进适用技术与创新模式，为畜牧业持续稳定发展做出了重要贡献。

链接:

http://agri.ckcest.cn/file1/M00/03/1E/Csgk0WHpRx6AaktgACC8Wn3mGxQ934.pdf

2．下好“先手棋”　引领现代化——各地积极谋划推进农业现代化示范区创建

【农民日报】冀辽蒙三省区交界地带，气候干燥而冷凉。有40余年种菇历史的河北承德平泉市，正迈出探索食用菌优势特色产业集群式现代化发展模式的新步伐。地处中温带干旱半干旱地区的甘肃省定西市安定区，在推良种、建基地、扩加工、促产销等方面作出整体布局，向建设西北寒旱农业高质量发展引领区的目标提速前行。全国闻名的“大

桃之乡”北京市平谷区，以健全都市农业产业体系为农业现代化的方向，正在聚力提升设施化、园区化、融合化、绿色化、数字化建设水平。全面建成小康社会以后，我国开启全面建设社会主义现代化国家新征程。为探索差异化特色化农业现代化推进机制和有效途径，全面推进乡村振兴，为国家现代化筑牢基础、建立支撑，农业农村部、财政部、国家发展改革委贯彻落实党中央、国务院战略部署，于2021年7月联合启动农业现代化示范区创建工作，提出把建设农业现代化示范区作为一项系统工程，因地制宜探索不同类型、不同条件地区农业现代化模式，率先在点上实现突破，示范带动全国面上农业现代化整体水平提升。创建启动以来，经综合考虑生产基础、装备水平、产业链、政策支持等因素，优中选优，目前已遴选出100个县（市、区）为第一批创建名单。立足现有产业发展基础，各地按照部署要求，制定方案，提出规划，明确路径，形成推动农业现代化示范区创建，探索中国特色农业现代化发展之路的燎原之势。

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpRYKANTdiADTWGnK9rOQ282.pdf

3．科技落地　开鲁玉米稳增产

【农民日报】内蒙古自治区通辽市开鲁县人民政府与中国农业科学院作物科学研究所签署了科技包县合作协议，开展玉米密植高产精准调控、机械籽粒直收、玉米优质专用、绿色标准化生产模式等科研合作，共同推进开鲁玉米产业科技创新和成果转化应用，提升玉米产量水平和产业效益，助力乡村振兴。中科院院士、中国农业科学院作物科学研究所所长钱前表示，开鲁县是玉米生产大县，玉米种植面积超过180万亩，具有巨大的粮食增产潜力。双方将以此次合作为契机，进一步加强合作关系，通过开鲁“科技包县”的典型示范带动，展示先进农业技术保障粮食安全、满足国家粮食需求的能力。

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpRyqAKOpKADycux7ILTk664.pdf

4．5G+智慧农业推进武汉社区建设助力乡村振兴

【新华网】新年伊始，武汉市“社区家13+1”企业联盟以“5G+应用”为基础的 “梦幻庄园”启动仪式，在武汉市江夏区五里界镇举行，省委统战部、省民宗委、省文化艺术交流协会、省政学院和区乡村振兴局等领导，各联盟企业家代表和省市媒体代表120多人出席了启动会。“梦幻庄园”是社区家在武汉社区打造的“5G+应用”系列品牌——“5G+智慧农业”和“5G+智慧教育”的融合产品，得到武汉三大电信运营商的支持和深度产品融合，通过社区青少年德智体美劳全部提升为基础，从而实现社区家庭教育与打造美丽乡村，促进乡村发展，振兴乡村经济的综合社会效益。

链接:

http://agri.ckcest.cn/file1/M00/03/1E/Csgk0WHpSteAFdg-AC_pZblh4g4504.pdf

5．数字技术下沉田间，联想打造智慧农业新标杆

【中国农网】农为邦本，本固邦宁。近年来，随着智能技术与农业产业体系、生产体系、经营体系的加快融合，智慧农业在助力乡村振兴中表现出巨大潜力，成为乡村振兴再开新局的重要着力点。2022年1月4日，联想在开年之际，发布品牌视频《智慧山河》。画面中，物联网设备分布于田野，展示了智慧农业在农业生产场景中的具体实施，是当前农业数字化转型落地乡村的真实写照。

链接:

http://agri.ckcest.cn/file1/M00/03/1E/Csgk0WHpSMuAdNSzAAlbvbahdmA091.pdf

6．农业科技自立自强 赋能产业绿色高质

【中国农网】发现水稻产量和氮肥利用协同调控新机制、首次绘制大豆图形结构泛基因组、首次解析猪早期胚胎染色质三维构……这一年，我国农业科技持续推进基础研究和关键核心技术攻关，重大创新成果竞相涌现，科技创新能力持续提升，在实现科技自立自强的新征程上阔步前行。

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpSXOAAfrJAAjVm31U0WE665.pdf

7．黑龙江省实施藏粮于地、藏粮于技战略 大力发展智慧农业

【新华网】2021年，黑龙江省粮食总产量比去年增加65.34亿斤，占全国总产量的11.5%，实现“十八连丰”，连续11年位居全国第一。高质量备耕保农资、高标准春播夺全苗、精细化夏管促升级、高效率抗灾抢丰收……作为全国粮食主产区，黑龙江深入实施藏粮于地、藏粮于技战略，抓紧抓稳粮食生产，坚决当好维护国家粮食安全“压舱石”。目前，全省农业综合机械化率、主要农作物良种覆盖率、科技进步贡献率分别达到98%、100%和68.3%，多项指标位居全国首位。

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpSwaAE3XAABOmLQpKswM624.pdf

【文献速递】

1．Ecological carrying capacity and sustainability assessment for coastal zones: A novel framework based on spatial scene and three-dimensional ecological footprint model

文献源：ScienceDirect,2022-04-01

摘要： The ecological carrying capacity (ECC) assessment in coastal zones is essential for sustainable coastal management, but there remains a lack of a more effective assessment method to be applied across broad contexts. In this study, we proposed the concept of spatial scene, a geographical unit with a coordinate position, and high unification in social-economic attributes, land cover, ecological function, and externalities, to substitute for the land use/land cover (LULC) in the traditional three-dimensional ecological footprint (EF3D) model, thereby establishing a novel framework for coastal ECC (CECC) assessment. The coastal zone of the Guangdong-Hong KongMacao Greater Bay Area (GBA) was chosen to examine the applicability and reliability of our framework. Results showed that the CECC estimated by spatial scene in the study area reached 0.1877 gha per capita, totaled 3.99 million gha in 2019, and the scenes of marine capture and forest provided the largest CECC. The per capita ecological footprint size (EFsize), ecological footprint depth (EFdepth), and EF3D reached 0.1684 gha, 14.35, and 2.42 gha, respectively, representing unsustainable development in the GBA coastal zone. The EF3D mainly distributed in scenes of grassland, forest, industrial, marine capture, coastal intertidal and offshore (CIO) portshipping, traffic station, dryland, and CIO industrial-urban, while only the scenes of services and CIO tourismentertainment were within CECC and therefore sustainable. Hong Kong, Huizhou, and Dongguan had the largest per capita EF3D. Compared to our results, the CECC and EFsize estimated by the traditional EF3D model were respectively 18% and 6% lower, while their EFdepth and EF3D were respectively 21% and 13% higher, which should be attributed to the significant differences in classification standard and scale between spatial scene and LULC. Our results showed higher correlations and more significant relationships with total gross domestic product (GDP), marine GDP, and main energy EF than those based on the traditional LULC, indicating a better reflection of the economic development status, energy consumption structure, and marine economic development modes by our framework. It is recommended to accelerate the industrial transformation and upgrading, and strengthen the conservation of ecological, agricultural, and marine space, in order to promote the sustainable development of GBA coastal zone. Our study revealed that our framework is capable of serving as a more effective and accurate method for assessing CECC and sustainability.

链接:

http://agri.ckcest.cn/file1/M00/03/1E/Csgk0WHpV-aATkdUAKSDWJwGqcY686.pdf

2．Progress and challenges of crop production and electricity generation in agrivoltaic systems using semi-transparent photovoltaic technology

文献源：ScienceDirect ,2022-04-01

摘要：The world population and consequently the global need for food continue to grow. At the same time, areas will be used to generate clean electricity to cope with climate change and global warming. The combination of crop production and solar photovoltaics in the form of “agrivoltaic technology” offers advantages for both sides that provide an adequate, resource-efficient solution to the persistent problem of competition for arable lands. The implementation of agrivoltaic systems has been exponentially increased in recent years and reached the global installed capacity of 2.8 GW in 2020 from the initial capacity of 5 MW in 2012. The agrivoltaic systems installed worldwide mostly employ conventional opaque photovoltaic (PV) modules, causing a change in the microclimate under the panels that become critical when shading ratios are high. Semi-transparent PV (STPV) modules have been recently employed to mitigate this issue which is profoundly studied in this research by considering the use of semi-transparent technologies based on crystalline silicon (c-Si), thin-film photovoltaics, organic PVs (OPVs), dye-sensitized solar cells (DSSCs), concentrating PVs (CPVs), and luminescent solar concentrators (LSCs) in open (arable farming lands) and closed (cultivation greenhouses) agrivoltaic systems. The results indicated that c-Si STPV modules have the highest share of employment in agrivoltaic systems due to their extreme benefits of low costs, high stability, and high efficiency in comparison with other technologies, while in contrast, the use of thinfilm STPV modules have been rarely reported in the literature. Additionally, STPV modules using OPVs and DSSCs offer the capability to achieve wavelength-selective transparency, causing the photosynthetic active radiation to pass through while the remained spectrum is utilized to generate electricity. Other potential solutions come from CPVs and LSCs, in which, diffuse light is available for the growth of cultivated plants, while direct concentrated sunlight can generate electricity. Although STPV modules are proven as a feasible solution for use in agrivoltaic systems, still more developments are required in terms of the modules’ efficiency enhancement and costs reduction, while more detailed research is required to observe the response of cultivated plants to make this technology a viable sustainable solution in the future.

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpVkOAEfK0ARBGMlMOhRA547.pdf

3．Reprogramming of phytopathogen transcriptome by a non-bactericidal pesticide residue alleviates its virulence in rice

文献源：ScienceDirect,2022-01-20

摘要：Bacteria equipped with virulence systems based on highly bioactive small molecules can circumvent their host's defense mechanisms. Pathogens employing this strategy are currently threatening global rice production. In the present study, variations in the virulence of the highly destructive Burkholderia plantarii were observed in different rice-producing regions. The environment-linked variation was not attributable to any known host-related or external factors. Co-occurrence analyses indicated a connection between reduced virulence and 5-Amino-1,3,4-thiadiazole-2-thiol (ATT), a non-bactericidal organic compound. ATT, which accumulates in rice plants during metabolization of specific agrochemicals, was found to reduce virulence factor secretion by B. plantarii up to 88.8% and inhibit pathogen virulence by hijacking an upstream signaling cascade. Detailed assessment of the newly discovered virulence inhibitor resulted in mechanistic insights into positive effects of ATT accumulation in plant tissues. Mechanisms of virulence alleviation were deciphered by integrating high-throughput data, gene knock-out mutants, and molecular interaction assays. TroK, a histidine protein kinase in a two-component system that regulates virulence factor secretion, is likely the molecular target antagonized by ATT. Our findings provide novel insights into virulence modulation in an important plant-pathogen system that relies on the host's metabolic activity and subsequent signaling interference.

链接:

http://agri.ckcest.cn/file1/M00/03/1E/Csgk0WHpVeOAVvnyAB7lGpE-vpg793.pdf

4．基于时序遥感数据的农作物种植制度研究进展与展望

文献源：地球信息科学学报,2022-01-19

摘要：及时准确掌握农作物种植制度时空分布信息,对于确保国家粮食安全与农业结构合理具有重要意义。随着时序遥感影像质量的不断提高,基于时序遥感数据的农作物种植制度研究备受关注。本文从研究框架、遥感特征参数以及数据产品等角度,分析了基于时序遥感数据的农作物种植制度最新研究进展。研究发现:（1）前农作物种植制度研究框架,主要包括耕地复种指数和农作物制图等相关内容,其问题在于需要高质量耕地分布数据支撑以及易将热带亚热带湿润区撂荒地误判为农作物等;（2）于红边和短波红外的新型多维度光谱指数,有助于更好地揭示农作物生长发育过程,大尺度农作物时序遥感

制图取得了系列研究成果,但需要应对不同作物光谱差异细微、同种作物在不同区域和年份存在明显类内异质性的挑战;(3)尺度中高分辨率耕地复种指数产品不断丰富,但其时效性和时空连续性有待加强;(4)欧美少数国家外,目前农作物分布数据产品覆盖的作物类型有限,我国大尺度农作物种植制度数据产品欠缺,特别是复杂多熟制农业区。随着多源遥感数据时空谱分辨率的不断提高以及云计算平台性能的不断发展,我们对以下方面进行了研究展望:(1)新研究框架,建立直接提取耕作区、农作物种植模式的农作物种植制度一体化遥感监测技术框架;(2)一步加强新型多维度遥感指数及其物候特征指标设计,拓展农作物种植制度监测的遥感特征参数;(3)立作物种植制度变化遥感监测技术,实现多年信息连续自动提取。

链接:

http://agri.ckcest.cn/file1/M00/03/1E/Csgk0WHpUgOAJOvBAClID_7uAbg834.pdf

5．基于无人机遥感的水稻产量估测

文献源：中国稻米,2022-01-14

摘要：水稻产量的准确估算在农业生产中具有重要意义。本文通过无人机搭载多光谱传感器,获取水稻主要生育期冠层光谱信息,通过提取不同生育期8种植被指数与水稻产量的实测值建立拟合关系,筛选出最优植被指数和最佳的无人机遥感作业时期,建立水稻估产模型。结果表明,水稻生长前期不适合估产,抽穗期至成熟期估产效果好。最佳估产生育期是水稻抽穗期,基于该时期的植被指数NDVI、RVI、DVI、GNDVI、MSAVI2建立的多元线性模型估测效果较好,验证精度佳。因此,利用无人机多光谱数据对水稻产量进行估测是可行的。

链接:

http://agri.ckcest.cn/file1/M00/03/1E/Csgk0WHpU5OADcS3ACEpkwjdLmA249.pdf

6．基于残差网络的遥感影像松材线虫病自动识别

文献源：林业工程学报,2022-01-14

摘要：松材线虫病是针对松树的特殊疾病,具有前期发病特征隐蔽、传播范围广、致病速度快的特点,因此面对林业病虫害问题,对受灾区域染病树木进行高效识别和分类,监测其他区域的树木生长情况,并且根据受灾情况确定损失,进行保险理赔是十分重要的。针对染病树木识别准确率低、识别速度慢的问题,本研究利用遥感影像和残差网络相结合的方法,并对残差网络进行优化改进,最终实现了松材线虫病树木的识别,降低人工识别成本,减少识别错误。以湖北省宜昌市远安县嫘祖镇作为研究区域,利用5幅高分一号遥感影像及部分GPS染病树木点作为数据源;通过图像分割、图像增强和坐标转换等一系列

预处理将原始数据制作成带有标签和坐标系结合的数据集;将数据集分别输入残差网络ResNet18、ResNet34、ResNet50、ResNet101、ResNet152模型中,根据模型在训练集和验证集上的F1值,结合模型在两个数据集上的准确率曲线及训练集的损失函数曲线,选择表现最好的模型,对其进行优化改进,提高识别精度。模型在Keras的深度学习平台下使用Python语言进行染病树木识别,研究结果表明,识别精度准确率达到87%,实现了松材线虫病树木识别,较适宜应用于林业病虫害问题诊断。

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpUnKAY8FIAB1_nX5g8nw092.pdf

7．基于Logistic算法与遥感影像的棉花虫害监测研究

文献源：华南农业大学学报,2022-01-06

摘要：借助多光谱遥感影像和Logistic算法，实现对棉田虫害的田间监测。以患虫害棉花区域为研究对象，无人机获取棉田多光谱遥感影像，并对影像进行预处理；结合棉花受虫害光谱特征，利用虫害敏感波段反射率与植被指数构建Logistic（逻辑）回归模型，开展棉花虫害识别监测研究。由土壤调节植被指数（Soil adjusted vegetation index，SAVI）模型和归一化植被指数（Normalized vegetation index，NDVI）模型构建的棉蚜虫、棉红蜘蛛、棉铃虫识别模型为最优模型，其训练样本准确率和测试样本准确率分别达到93.7%和90.5%，召回率、F1值分别为96.6%和93.5%，对棉蚜虫、棉红蜘蛛、棉铃虫的识别精度分别达到94.2%、85.1%和66.3%。该模型可满足棉田中棉蚜虫、棉红蜘蛛、棉铃虫3种虫害的发生区域识别，并可基本满足棉田精准植保作业相关要求。

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpU76ACqCkABNDJiL3lc0391.pdf

【会议论文】

1．A Survey on the Role of IoT in Agriculture for the Implementation of Smart Livestock Environment

发布源：IEEE

发布时间：2022-01-13

摘要：The Internet of Things (IoT) is an emerging paradigm that is transforming real-world things (objects) into smarter devices. IoT is applicable to a variety of application domains including healthcare, smart grid, and agriculture. This domain has started revolutionizing the agriculture industry by providing smart solutions for precision farming, greenhouse management, and livestock monitoring. This article aims to present a comprehensive survey

on the role of IoT in the Livestock field by categorizing and synthesizing existing research work in this area. To this end, a detailed discussion has been provided on IoT network infrastructure, topologies and platforms employed for livestock management. In addition, a list of communication protocols and connections of IoT-based livestock systems with relevant technologies have also been explored. Furthermore, numerous IoT-based livestock monitoring, controlling, and tracking applications have been discussed. Apart from this, it also analyses distinct security issues in IoT-based livestock field and developed a collaborative security model to detect and minimize the security risk. Lastly, pertinent open research challenges in the domain of IoT-based livestock management have been presented with future research directions.

链接:

http://agri.ckcest.cn/file1/M00/03/1E/Csgk0WHpTO6AbZv9ABIO4VjLvxg281.pdf

2．Renewable Energy Integration Into Cloud & IoT-Based Smart Agriculture

发布源：IEEE

发布时间：2021-12-23

摘要：Water is becoming scarcer. The unmonitored control and the extensive use of fossil fuel in water-table pumping for irrigation exacerbate global warming and harm the environment. Along with the rapid population growth and the concomitant increase in the demand for food, optimal usage of water-table and energy is becoming a must and indispensable for sustainable agriculture. In this context, Smart Agriculture (SA) is emerging as a promising field that leverages ICT (Information and Communication Technology) to optimize resources' usage while enhancing crops' yields. In this paper, we present an integral SA solution that leverages cost-effectiveness . Commercial solutions are costly and thus become impossible to adopt by small and medium farmers. Our solution revolves around three main axes: 1. Smart Water Metering promotes optimal usage and conservation of water-table (a.k.a., groundwater) via real-time data collection and monitoring using a Cloud-based IoT (Internet of Things) system; 2. Renewable-Energy integration promotes energy-efficient agriculture by reducing reliance on fossil fuels in water-table pumping, and 3. Smart Irrigation to promote good crops quality and quantity without harming the soil and the water-table ecosystems. Our solution has been deployed and tested in a real-world Smart Farm testbed. The results have shown that the adoption of our SA system reduces the amount of water consumption (with a traditional irrigation

system) up to 71.8%. Finally, our solution is open-source and can be easily adopted and adapted by other researchers to promote the setting of a dedicated Cloud-based platform for water-table usage, especially in arid and sub-Saharan countries.

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpTRCAF8pJAC4SWZUh43Q722.pdf

3．A Scalable Hybrid Network for Agriculture Environment Monitoring

发布源：IEEE

发布时间：2021-12-19

摘要：Nowadays, agricultural production needs to improve the quality and yield of crops by monitoring their growth environment. The monitoring locations have the characteristics of wide distribution, high density, and large quantity. Thus, a networking method suitable for agricultural environmental monitoring is required. LoRa wireless communication technology has the advantages of long range and strong diffraction ability, while its date rate is low. NRF24L01P is a single-chip wireless transceiver working in the 2.4 to 2.5 GHz ISM band. It has the advantages of high data rate, low energy consumption and cost effectiveness, but the communication range is short. By the combination of the two technologies, this article proposes a scalable hybrid networking method based on the needs of agricultural environment monitoring. This method takes the advantage of LoRa and NRF24L01P networking and is suitable for agricultural environmental data collection. The collected data is finally uploaded to the cloud via WiFi so that end users can remotely access the agricultural data. The experimental results show that the proposed hybrid network can improve the data collection efficiency and data transmission distance.

链接:

http://agri.ckcest.cn/file1/M00/03/1E/Csgk0WHpTsOAI33BABgQjKeiguM668.pdf

4．Evaluation of Crop Health Status With UAS Multispectral Imagery

发布源：IEEE

发布时间：2021-12-02

摘要：This study presents the results of a field experiment conducted for assessing the crop health status of several barley and oat crop fields in Prince Edward Island, Canada. The crop fields were mapped with an unmanned aircraft system (UAS), and the crop health status was assessed through the green area index (GAI) and vegetation indices (VIs). GAI maps

were produced from the UAS imagery and VIs used machine learning pipelines with several regression algorithms (multiple linear models, support vector machines, random forests, and artificial neural networks) along with a feature selection strategy. The random forests algorithm was shown to be the best algorithm for GAI prediction with an average relative root mean square error of 10.86% and a mean absolute error of 0.67. The resulting GAI maps and the regression feature space were classified with random forests to discriminate between vigorous and stressed crop areas. We achieved a mean overall accuracy of 94%. The limits of the study are also presented.

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpULiAc3_cAGjZbrHoO9w240.pdf

5．Analyzing Effects of Crops on SMAP Satellite-Based Soil Moisture Using a Rainfall–Runoff Model in the U.S. Corn Belt

发布源：IEEE

发布时间：2021-11-26

摘要： L-band microwave satellite missions provide soil moisture information potentially useful for streamflow and, hence, flood predictions. However, these observations are also sensitive to the presence of vegetation that makes satellite soil moisture estimations prone to errors. In this study, the authors evaluate satellite soil moisture estimations from Soil Moisture Active Passive (SMAP) and Soil Moisture Ocean Salinity and two distributed hydrologic models with measurements from in situ sensors in the Corn Belt state of Iowa, a region dominated by annual row crops of corn and soybean. First, the authors compare model and satellite soil moisture products across Iowa using in situ data for more than 30 stations. Then, they compare satellite soil moisture products with state-wide model-based fields to identify regions of low and high agreement. Finally, the authors analyze and explain the resulting spatial patterns with Moderate Resolution Imaging Spectroradiometer vegetation indices and SMAP vegetation optical depth. The results indicate that satellite soil moisture estimations are drier than those provided by the hydrologic model, and the spatial bias depends on the intensity of row-crop agriculture. The work highlights the importance of developing a revised SMAP algorithm for regions of intensive row-crop agriculture to increase SMAP utility in the real-time streamflow predictions.

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpT8WAVfMwAGNufXWkTFE363.pdf

【相关专利】

1．一种基于基准面的农田无人机避障作业方法和装置

发布源：中国专利

发布时间：2021-12-31

摘要：本申请揭示了一种基于基准面的农田无人机避障作业方法,在第一空中位置执行第一索降操作；得到第一拉力数值序列；计算出第一启动因子；若第一启动因子小于启动阈值,则执行第一移动操作；执行第二索降操作；得到第二拉力数值序列；计算出第二启动因子；若第二启动因子小于启动阈值,则执行第二移动操作；得到第三拉力数值序列、...、和第n拉力数值序列；计算出基准底面、基准顶面和基准密度面；控制无人机在初始位置开始进行作业,并获取无人机作业路径前方的响应数据；根据基准底面、基准顶面、基准密度面和响应数据,生成避障飞行策略,并根据避障飞行策略控制无人机避障飞行,实现提高农田无人机避障作业效果的目的。

链接:

http://agri.ckcest.cn/file1/M00/03/1E/Csgk0WHpW2aAA_5fABhfbx3rWeQ111.pdf

2．一种基于区块链的农业科技园区环境信息共享系统和方法

发布源：中国专利

发布时间：2021-12-10

摘要：本发明提出一种基于区块链的农业科技园区环境信息共享系统和方法,包括感知层、区块链层、智能合约层、共享管理层,采取区块链上目录存储、链下扩展存储的方式实现来源分散的子物联网数据归一化整合,采用权限控制和认证管理,实现数据隐私保护,基于该发明可将农业科技园区内已建立的大量异构环境监测子物联网信息孤岛融合到农业科技园区公共信息服务平台上,实现覆盖全园区的环境信息共享。

链接:

http://agri.ckcest.cn/file1/M00/0F/F0/Csgk0GHpWYqAe8--AAhytOLHND4047.pdf

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