农业与资源环境信息工程专题

本期导读

➤ 前沿资讯

1．大数据帮助农民增加利益同时保护环境

➤ 学术文献

1．SAR遥感在农业中应用研究进展：综述

2．基于边缘和云计算的智能农业物联网平台

3．具有物联网和云支持的上下文感知控制和监控系统

➤ 专业会议

1．2019年农业信息通信技术大会：在数字世界中提升抵御能力，以及营养和水的获取

➤ 前沿资讯

1 .Big Data Shows How to Improve Profits and Help Environment（大数据帮助农民增加利益同时保护环境）

简介：现代技术总是能改变人们思维方式和工作方式。近期密歇根州立大学进行了一项研究，该项目可以帮助农民识别农田那些区域可以有较高的作物产量，以及那些区域可以持续使用。基于这些参考，可以帮助农民有效的节省时间和金钱，同时减少肥料损失和降低温室气体的排放。

来源：美国农业部（USDA）

发布日期：2019-04-22

全文链接：https://www.usda.gov/media/blog/2019/04/22/big-data-shows-how-improve-profits-and-help-environment

➤ 学术文献

1．Research advances of SAR remote sensing for agriculture applications: A review（SAR遥感在农业中应用研究进展：综述）

简介：Synthetic aperture radar (SAR) is an effective and important technique in monitoring crop and other agricultural targets because its quality does not depend on weather conditions. SAR is sensitive to the geometrical structures and dielectric properties of the targets and has a certain penetration ability to some agricultural targets. The capabilities of SAR for agriculture applications can be organized into three main categories: crop identification and crop planting area statistics, crop and cropland parameter extraction, and crop yield estimation. According to the above concepts, this paper systematically analyses the recent progresses, existing problems and future directions in SAR agricultural remote sensing. In recent years, with the remarkable progresses in SAR remote sensing systems, the available SAR data sources have been greatly enriched. The accuracies of the crop classification and parameter extraction by SAR data have been improved progressively. But the development of modern agriculture has put forwarded higher requirements for SAR remote sensing. For instance, the spatial resolution and revisiting cycle of the SAR sensors, the accuracy of crop classification, the whole phenological period monitoring of crop growth status, the soil moisture inversion under the condition of high vegetation coverage, the integrations of SAR remote sensing retrieval information with hydrological models and/or crop growth models, and so on, still need to be improved. In the future, the joint use of optical and SAR remote sensing data, the application of multi-band multi-dimensional SAR, the precise and high efficient modeling of electromagnetic scattering and parameter extraction of crop and farmland composite scene, the development of light and small SAR systems like those onboard unmanned aerial vehicles and their applications will be active research areas in agriculture remote sensing. This paper concludes that SAR remote sensing has great potential and will play a more significant role in the various fields of agricultural remote sensing.

更多资讯 尽在农业专业知识服务系统：http://agri.ckcest.cn/

2．Smart farming IoT platform based on edge and cloud computing（基于边缘和云计算的智能农业物联网平台）

简介：Precision Agriculture (PA), as the integration of information, communication and control technologies in agriculture, is growing day by day. The Internet of Things (IoT) and cloud computing paradigms offer advances to enhance PA connectivity. Nevertheless, their usage in this field is usually limited to specific scenarios of high cost, and they are not adapted to semi-arid conditions, or do not cover all PA management in an efficient way. For this reason, we propose a flexible platform able to cope with soilless culture needs in full recirculation greenhouses using moderately saline water. It is based on exchangeable low-cost hardware and supported by a three-tier open source software platform at local, edge and cloud planes. At the local plane, Cyber-Physical Systems (CPS) interact with crop devices to gather data and perform real-time atomic control actions. The edge plane of the platform is in charge of monitoring and managing main PA tasks near the access network to increase system reliability against network access failures. Finally, the cloud platform collects current and past records and hosts data analytics modules in a FIWARE deployment. IoT protocols like Message Queue Telemetry Transport (MQTT) or Constrained Application Protocol (CoAP) are used to communicate with CPS, while Next Generation Service Interface (NGSI) is employed for southbound and northbound access to the cloud. The system has been completely instantiated in a real prototype in frames of the EU DrainUse project, allowing the control of a real hydroponic closed system through managing software for final farmers connected to the platform.

3．Context-aware control and monitoring system with IoT and cloud support（具有物联网和云支持的上下文感知控制和监控系统）

简介：The main goal of the paper is to integrate three emergent technologies (Internet of Things, Cloud Computing and Context awareness) in a multi-layered architecture for developing real-time process control agriculture application. For this, the paper presents original solutions for a Control and Monitoring unit (CMU) which performs real-time control as an entity running on an IoT platform, a Context-aware Control Platform (CaCP) with a three-tier architecture, serving as middleware mechanism for interfacing environmental sensors with IoT and Cloud and a four-level architecture to perform agriculture process control, that includes the CMU and CaCP modules. These solutions are validated by a case study application implemented on an IBM Bluemix IoT platform which performs automatic

control of an irrigation system using context aware adaptation of controller parameters in response to environmental changes.

来源：Computers and Electronics in Agriculture

发布日期:2019-01

全文链接:http://agri.ckcest.cn/file1/M00/06/6B/CsgkOFzGwdCAAHnPABhV-KnxvLo567.pdf

➤ 专业会议

1．ICTforAg 2019: Advancing resilience, nutrition and water access in a digital world（2019年农业信息通信技术大会：在数字世界中提升抵御能力，以及营养和水的获取）

简介：You could join global leaders for a 1-day conference exploring the future of agriculture, food security, resilient populations and technology, on June 5, 2019 in Washington, DC. This conference will explore how data, new technologies and innovation are remaking food and water systems and value chains around the world, and how international development organizations can leverage these changes to accelerate impact. This conference is sponsored by the Feed the Future, ICTforAg 2019 will be a smaller, more interactive event, focused on technical dialogue and networking. The conference will explore:-

● What's new in digital for resilience and food security (D4RFS)?

● How could Digital Farmer Profiles fundamentally reshape food security, resilience and nutrition?

● Which enabling environment factors support digital solutions for food security?

● When can we take advantage of preexisting and established technologies?

● What you need to know about changes in agricultural extension, farm management, market access and financial inclusion;

● Where can international development drive business model innovations in new agricultural technologies?

● Who is investing in new AgTech solutions and what are they learning?

来源：FAO

发布日期:2019-04-25

全文链接:http://www.fao.org/e-agriculture/news/ictforag-2019-advancing-resilience-nutrition-and-water-access-digital-world

更多资讯 尽在农业专业知识服务系统:http://agri.ckcest.cn/