



2022年第25期总346期

农业与资源环境信息工程专题

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2022年6月20日

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➤ 会议论文

1 . Data analytics platforms for agricultural systems: A systematic literature review (农业系统数据分析平台：系统文献综述)

简介： With the rapid developments in ICT, the current agriculture businesses have become increasingly data-driven and are supported by advanced data analytics techniques. In this context, several studies have investigated the adopted data analytics platforms in the agricultural sector. However, the main characteristics and overall findings on these platforms are scattered over the various studies, and to the best of our knowledge, there has been no attempt yet to systematically synthesize the features and obstacles of the adopted data analytics platforms. This article presents the results of an in-depth systematic literature review (SLR) that has explicitly focused on the domains of the platforms, the stakeholders, the objectives, the adopted technologies, the data properties and the obstacles. According to the year-wise analysis, it is found that no relevant primary study between 2010 and 2013 was found. This implies that the research of data analytics in agricultural sectors is a popular topic from recent years, so the results from before 2010 are likely less relevant. In total, 535 papers published from 2010 to 2020 were retrieved using both automatic and manual search strategies, among which 45 journal articles were selected for further analysis. From these primary studies, 33 features and 34 different obstacles were identified. The identified features and obstacles help characterize the different data analytics platforms and pave the way for further research.

来源： Computers and Electronics in Agriculture

发布日期：2022-03-09

全文链接：<http://agri.ckcest.cn/file1/M00/03/34/Csgk0YcBbb0ARecNADuLUwvnUNg688.pdf>

➤ 科技报告

1 . Thinking about the future of food safety (思考食品安全的未来)

简介： 农业食品系统正在经历转型，旨在为所有人提供更安全、更实惠和更健康的饮食和可持续的生产方式，同时提供公正和公平的生计：这是实现联合国 2030 年可持续发展议程的关键。然而，这一转型需要在全世界粮食和农业部门面临重大挑战的背景下实施，气候变化、人口增长、城市化和自然资源枯竭等驱动因素加剧了这些挑战。食品安全是农业食品系统的基石，所有食品安全参与者都面临正在进行的转型，同时准备应对可能出现的潜在威胁、破坏和挑战。食品安全方面的远见有助于主动识别农业食品系统内外的驱动因素和相关趋势，这些因素对食品安全产生影响，因此也对消费者健康、国民经济和国际贸易产生影响。及早识别和评估驱动因素和趋势可促进战略规划和准备，以利用新出现的机会并应对食品安全方面的挑战。在本报告种，粮农组织食品安全展望计划概述了主要的全球驱动因素和趋势，通过外推描述了它们对食品安全的影响，特别是对农业食品系统的影响。报告的各种驱动因素和趋势包括气候变化、不断变化的消费者行为和偏好、新的食物来源和生产系统、技术进步、微生物组、循环经济、食品欺诈等。

来源： FAO

发布日期：2022-04

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全文链接:http://agri.ckcest.cn/file1/M00/10/06/Csgk0GKq-3CAQp50AMvaBA_37fU589.pdf

➤ 科技图书

1 . On-Combine Sensing Techniques in Arable Crops (可耕作物的组合传感技术)

简介: A combine harvester provides unique capabilities as a mobile sensing platform. This chapter aims to contribute to the advancement of on-combine sensor use for obtaining site-specific crop data by trying to convince potential users in the agricultural community of its value and accessibility. Today, mass/volume flow and electrical capacitance sensors are widely used for measuring grain yield and moisture. A variety of other sensors have been used in crop analysis and process control that include photoelectronic spectrometers for analysis of crop quality attributes as well as ultrasonic and laser sensors for quantifying aboveground biomass. Applications of this information include precision N management, post-harvest assessment of crop stress, grain segregation by protein concentration and mapping of late-season weed infestations. Barriers challenging wider adoption of on-combine sensing techniques include the need for (i) software for exploring multi-year yield data and constructing profit zones, (ii) inexpensive spectrometers for grain quality measurement and mapping, (iii) commercial firms offering services in spectroscopy, custom mapping and data fusion, (iv) stand-alone units with user interface and firmware for multi-sensor data collection, and (v) field studies demonstrating economic benefits of various applications of information from on-combine sensing.

来源: Sensing Approaches for Precision Agriculture

发布日期:2021-11-24

全文链接:<http://agri.ckcest.cn/file1/M00/10/06/Csgk0GKqvBOAGy1bAAuw-kRA6gY020.pdf>

2 . Sensing Approaches for Precision Agriculture-Soil Sensing (精准农业中的传感技术-土壤传感)

简介: In addition to the overview of diversity in soil sensing technologies, this chapter presents four case studies to illustrate the practical use of these technologies to enhance precision agriculture in Canada, the United Kingdom, Sweden and Papua New Guinea. These studies represent investigations of different instruments, field conditions and targeted soil properties. However, in all four cases, proximal soil sensing was used to predict selected soil properties to generate relatively accurate maps that could help to implement site-specific crop management successfully.

来源: Sensing Approaches for Precision Agriculture

发布日期:2021-11-24

全文链接:<http://agri.ckcest.cn/file1/M00/03/34/Csgk0YcBbGeAXuycABm1FdDPq54858.pdf>

3 . Satellite Remote Sensing for Precision Agriculture (卫星遥感在精准农业中的应用)

简介: The objective of this chapter is to review a wide range of satellite sensors that have potential

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for application in precision agriculture (PA). Classes of satellite sensors included are multispectral, hyperspectral and synthetic aperture radar satellite sensors. Multispectral and radar sensors for digital surface models are also reviewed. For each class of sensor, years of satellite operation, and wavelengths, bandwidths, spectral resolution, revisit frequencies and spatial resolutions are considered. These factors, along with signal to noise ratio and cost, determine the applicability of satellite remote sensing to PA. For each satellite, examples are given regarding the use and potential applications in PA. One of the most promising new satellites for PA applications is the Sentinel-2 platform provided by the European Space Agency (ESA) at no cost. This is an excellent option with its good spatial resolution ranging from 10 to 20 m, high spectral resolution (12 bits per pixel), and a relatively quick revisit frequency of 5 days. Narrow wavebands useful for diagnosing specific soil conditions or crop stressors with hyperspectral satellite imagery are reviewed. Potential applications in PA are discussed involving synthetic aperture radar (SAR), sun-induced fluorescence (SIF) and digital surface model (DSM) satellite products.

来源: Sensing Approaches for Precision Agriculture

发布日期: 2021-11-24

全文链接: http://agri.ckcest.cn/file1/M00/10/06/Csgk0GKquoaANBN5AAgkIOS_p0E748.pdf