



2019年第6期总173期

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## ▶ 前沿资讯

### 1 . An improved method for estimating the probability of extreme events was developed at VTT (芬兰国家技术研究中心开发一种预测极端事件发生概率的方法)

简介: Researchers at VTT Technical Research Centre of Finland have developed a new and more accurate method for estimating the probability of extreme events, such as storms, floods and earthquakes. The new method will be used in updating building codes and land-use regulations, and is applicable also in developing artificial intelligence, as well as in economics and medical data analysis. Extreme events, such as storms, floods and earthquakes have always been disastrous to civilizations. Communities prepare for them by rigid constructions, flood banks, drainage channels and avoiding building at hazardous locations. For all such preparations, being able to estimate the probability of hazardous extremes is crucial. The estimation is based on the statistics of previously observed extremes, studied by so-called extreme value analysis. Many extreme value analysis methods exist and it has not been clear which of them should be preferred.

来源: EurekAlert

发布日期: 2019-01-25

全文链接: [https://www.eurekalert.org/pub\\_releases/2019-01/vtrc-aim012519.php](https://www.eurekalert.org/pub_releases/2019-01/vtrc-aim012519.php)

## ▶ 学术文献

### 1 . Perspectives for Remote Sensing with Unmanned Aerial Vehicles in Precision Agriculture (精准农业中无人机遥感的观点)

简介: Remote sensing with unmanned aerial vehicles (UAVs) is a game-changer in precision agriculture. It offers unprecedented spectral, spatial, and temporal resolution, but can also provide detailed vegetation height data and multiangular observations. In this article, we review the progress of remote sensing with UAVs in drought stress, in weed and pathogen detection, in nutrient status and growth vigor assessment, and in yield prediction. To transfer this knowledge to everyday practice of precision agriculture, future research should focus on exploiting the complementarity of hyperspectral or multispectral data with thermal data, on integrating observations into robust transfer or growth models rather than linear regression models, and on combining UAV products with other spatially explicit information.

来源: Trends in Plant Science

发布日期: 2018-12-15

全文链接: <http://agri.ckcest.cn/file1/M00/06/5D/Csgk0FxrZ6-A0zHSACqYtdjBZxY471.pdf>

### 2 . A distributed data management system to support large-scale data analysis (支持海量数据分析的分布式数据管理系统)

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**简介:** Distributed data management is a key technology to enable efficient massive data processing and analysis in cluster-computing environments. Specifically, in environments where the data volumes are beyond the system capabilities, big data files are required to be summarized by representative samples with the same statistical properties as the whole dataset. This paper proposes a big data management system (BDMS) based on distributed random sample data blocks. It presents a high-level architecture design of the BDMS which extends the current distributed file systems. This system offers certain functionalities for block-level management such as statistically-aware data partitioning, data blocks organization, and data blocks selection. This paper also presents a round-random partitioning scheme to represent a big dataset as a set of non-overlapping data blocks; each block is a random sample of the whole dataset. Based on the presented scheme, two algorithms are introduced as an implementation strategy to convert the HDFS blocks of a big file into a set of random sample data blocks which is also stored in HDFS. The experimental results show that the execution time of partitioning operation is acceptable in the real applications because this operation is only performed once on each input data file.

**来源:** Journal of Systems and Software

**发布日期:** 2018-11-08

**全文链接:** <http://agri.ckcest.cn/file1/M00/06/5D/Csgk0FxFaieAET0eAC0fceZAUjQ936.pdf>

### **3 .Rules engine and complex event processor in the context of internet of things for precision agriculture (精准农业物联网环境中的规则引擎和复杂事件处理器)**

**简介:** The Internet of Things (IoT) applications monitor large data flows and events in real time, some raw data is captured from devices located in wireless sensor networks (WSN) and used to make control decisions about actuators. This can be a major problem when the devices grow in number as well as the data that is captured. In this paper, we propose an architecture called "RECEP" for the dynamic processing of events generated in the context of IoT and Precision Agriculture (PA); it is made up of two components: Rules Engine (RE) and Complex Event Processor (CEP). RE allows you to configure dynamic rules conditioning input data from different sources and planning control actions on actuators, alerts, and notifications for end users or applications. The CEP component fuses the input data at the rate at which they arrive, with the rules established in the RE and it performs a prescriptive analysis that consists not only in predicting or detecting patterns of events, but in making automatic decisions. RECEP was implemented in a virtual machine with a 1.9 GHz CPU and 6 GB RAM, then it was integrated into an intelligent irrigation system of an experimental banana plot located in Machala-Ecuador. A WSN simulator was also used to generate sensor data in large quantities, the CEP was evaluated with several test cases, and results show that it consumes computational resources with a growth trend, represented by a logarithmic regression model ( $r\text{-squared} > 0.9$ ); that is, the more events are processed, there is a minimum consumption of resources. It was tested for fifteen days; around 25 thousand events/s were processed. Our RECEP can be implemented in low-cost

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infrastructure typical of small and large banana producers.

来源: Computers and Electronics in Agriculture

发布日期: 2018-09-20

全文链接: [http://agri.ckcest.cn/file1/M00/06/5D/Csgk0FxRaJKADoBmADuMAOUE\\_zE778.pdf](http://agri.ckcest.cn/file1/M00/06/5D/Csgk0FxRaJKADoBmADuMAOUE_zE778.pdf)

## ➤ 科技报告

### 1 . From open weather data to accessible weather information services for smallholder farmers (从开放的气候数据到为小农提供畅通的天气服务)

简介: 基于天气数据开展的服务具有很大发展潜力, 可以支持小农户在农场管理方面做出运营决策。作物生产受天气变化的驱动, 因此农业生产情况好坏直接取决于天气条件。例如播种、收获、施肥等许多农业活动的规划和有效性与天气条件有直接关系, 鉴于此, 所有农业利益相关者都会对气象数据产生兴趣。本报告概述了农业和食物营养中天气数据的重要性和益处, 天气数据价值链中存在的挑战以及应对这些挑战的建议。

来源: 全球农业与营养开放数据网 (GODAN)

发布日期: 2018-05

全文链接: <http://agri.ckcest.cn/file1/M00/06/5D/Csgk0FxRZvCapijrAAPpBtCcQT4604.pdf>