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前沿资讯

1．Can machine learning reveal geology humans can't see?(机器学习能否展示人眼看不到的地质？)

简介：Identifying geological features in a densely vegetated, steep, and rough terrain can be almost impossible. Imagery like LiDAR can help researchers see through the tree cover, but subtle landforms can often be missed by the human eye. Now, a team of scientists has tapped into the power of machine learning to identify hidden geologic features. Specifically, the scientists are identifying previously unidentified cave entrances that are difficult to see in imagery, and hard to access on the ground.

来源：ScienceDaily（美国）

发布日期:2019-09-23

全文链接:http://agri.ckcest.cn/file1/M00/0E/C9/CsgkOF2MYZGAbfkOAAGKknd8vk8459.pdf

2．Predicting the Future, Today with Yield Prediction(通过预测作物产量预测未来)

简介：随着丰收的开始、进行和结束，伴随收获的成果开始逐渐显现，几个月的辛苦的劳作变成肉眼可见的成果，此时“产量有多少”的问题开始浮现在脑海中。作为数字农业的领导者，加拿大Farmer Edge懂得单产对农民至关重要，但也认识到田地收割前很难进行预估，特别换季时许多因素将影响最终产量。Farmer Edge公司通过机器学习方法，利用一些算法衡量气象站、土壤湿度探测器等农场硬件设备数据以及每日卫星图像、遥感、土壤测试信息等多源信息，为种植者提供产量预测，并允许种植者甚至可以在不接触田地前就了解整个农场的产量。

来源：加拿大Farmer Edge公司

发布日期:2019-09-06

全文链接:http://agri.ckcest.cn/file1/M00/0E/C9/CsgkOF2MXQmAeaQOAAP3uLTHETM082.pdf

学术文献

1．IoT information sharing security mechanism based on blockchain technology(基于区块链技术的物联网信息共享安全机制)

简介：The blockchain is the first distributed recording system with its own trust mechanism. It builds a reliable architecture for decentralized control through multi-node information redundancy. Based on this, this paper proposes lightweight IoT information sharing security framework based on blockchain technology. The framework adopts a double-chain model combining data blockchain and transaction blockchain: distributed storage and tamper-proof of data in the data blockchain, and improved by the improved practical Byzantine fault-tolerant (PBFT) mechanism consensus algorithm. Data registration efficiency;

resource and data transactions in the transaction blockchain is improved transaction efficiency and privacy protection through improved algorithms based on partial blind signature algorithms. A dynamic game method of node cooperation is proposed to prevent malicious behavior of local dominance. The state of the unknown node is estimated by reporting the node's institutional reputation value; the high-trust reference report is used to correct the weight of the malicious node in the overall report and node merging, and finally reach the Bayesian equilibrium. Finally, the simulation experiment department carried out verification analysis on the anti-attack capability, double-strand processing capability and delay. The results show that the framework is safe, effective and feasible, and it is feasible to verify the location information of the system for secure storage devices.

来源： Future Generation Computer Systems

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全文链接:http://agri.ckcest.cn/file1/M00/0E/C9/CsgkOF2MaBGAH6RFACZbg16LfR4074.pdf

2．Remote sensing for drought monitoring & impact assessment: Progress, past challenges and future opportunities(用于干旱监测和作用评估的遥感：进展，过去的挑战和未来的机遇)

简介： Drought is a common hydrometeorological phenomenon and a pervasive global hazard. As our climate changes, it is likely that drought events will become more intense and frequent. Effective drought monitoring is therefore critical, both to the research community in developing an understanding of drought, and to those responsible for drought management and mitigation. Over the past 50 years remote sensing has shifted the field away from reliance on traditional site-based measurements and enabled observations and estimates of key drought-related variables over larger spatial and temporal scales than was previously possible. This has proven especially important in data poor regions with limited in-situ monitoring stations. Available remotely sensed data products now represent almost all aspects of drought propagation and have contributed to our understanding of the phenomena. In this review we chart the rise of remote sensing for drought monitoring, examining key milestones and technologies for assessing meteorological, agricultural and hydrological drought events. We reflect on challenges the research community has faced to date, such as limitations associated with data record length and spatial, temporal and spectral resolution. This review then looks ahead to the future in terms of new technologies, such as the ESA Sentinel satellites, analytical platforms and approaches, such as Google EarthEngine, and the utility of existing data in new drought monitoring applications. We look forward to the continuation of 50 years of progress to provide effective, innovative and efficient drought monitoring solutions utilising remote sensing technology.

来源： Remote Sensing of Environment

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全文链接:http://agri.ckcest.cn/file1/M00/0E/C9/CsgkOF2MZRaAbujrABTiyhZ7Uyg676.pdf

3 .Predicting high-magnitude, low-frequency crop losses using machine learning: an application to cereal crops in Ethiopia(使用机器学习预测高幅度、低频次的作物损失：应用于埃塞俄比亚谷物的案例)

简介：Timely and accurate agricultural impact assessments for droughts are critical for designing appropriate interventions and policy. These assessments are often ad hoc, late, or spatially imprecise, with reporting at the zonal or regional level. This is problematic as we find substantial variability in losses at the village-level, which is missing when reporting at the zonal level. In this paper, we propose a new data fusion method—combining remotely sensed data with agricultural survey data—that might address these limitations. We apply the method to Ethiopia, which is regularly hit by droughts and is a substantial recipient of ad hoc imported food aid. We then utilize remotely sensed data obtained near mid-season to predict substantial crop losses of greater than or equal to 25% due to drought at the village level for five primary cereal crops. We train machine learning models to predict the likelihood of losses and explore the most influential variables. On independent samples, the models identify substantial drought loss cases with up to 81% accuracy by mid- to late-September. We believe the proposed models could be used to help monitor and predict yields for disaster response teams and policy makers, particularly with further development of the models and integration of soon-to-be available high-resolution, remotely sensed data such as the Harmonized Landsat Sentinel (HLS) data set.

来源：Climatic Change

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全文链接:http://agri.ckcest.cn/file1/M00/0E/C9/CsgkOF2MaOWAXnn4AAvugLIXWI0072.pdf