DAAfrica'2024: Data Science for Agriculture in Africa

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Abstract

Data science in agriculture has evolved with the increasing accessibility of data to farmers, which allows them to analyze and make decisions. Today, new technologies such as the Internet of Things (IoT) enable the collection and storage of farm and environmental data (e.g., soil data and water data) in dedicated databases and/or data warehouses. These agricultural data can be combined with other data sources (e.g., remote sensing, weather stations, and social media), highlighting the need to address new challenges, such as the use of heterogeneous data.

Keywords

Data science, agriculture

Preface

Data science in agriculture aims to explore and mine agricultural data via different techniques, such as machine learning, deep learning, computer vision, text mining, and large language models (LLMs). For example, data science can be used to predict crop yields and plant and animal diseases with different variables, including rainfall, temperature fluctuations, and soil conditions, by using a variety of data sources (e.g., sensor data, texts, satellite images, and plant images).

Therefore, agriculture professionals and decision-makers can use data science to obtain information and knowledge on which they can base decisions about agricultural activities in Africa.

During the DAAfrica'2024 workshop that brought around 50 attendees, nine abstracts were submitted and seven papers are finally published in these CEUR proceedings.

Topics of interest

The topics of the workshop encompass all aspects concerning the intersection of data science and agriculture in Africa with different applications:

- Smart Farming
- Yield and production
- Plant species identification
- Land cover monitoring
- Crop recommendation
- Crop monitoring and forecasting
- Monitoring of animal and plant health
- Agroecology and water management
- Food safety and security
- etc.

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Papers in these CEUR proceedings

1. *Kinyua Gikunda, Nicolas Jouandeau*, Lightweight Deep Learning for Weather Prediction and Forecasting in Africa, p3-7
2. *Marouane Kihal, Lamia Hamza, Mohammed Charif Kihal*, Advanced Binary Classification for Disease Detection in Trees Using a novel Machine-Deep Learning method, p8-12
3. *Arnaud S. R. M. Ahouandjinou, Ambroise D. K. Houedjissin, Manhougbé Probus A. F. Kiki, François Xavier Amétépé, Kokou M. Assogba*, Lightweight segmentation of UAV images for early detection of maize leaf diseases, p13-23
4. *Belayneh Dejene, Gizachew Setegn, Selamawit Belay*, Explainable and Interpretable Dry Beans Classification using Soft Voting Classifier, p24-38
5. *Akouyo Yvette Gbedevi, Kossi Atchonouglo, Sid Ahmed Lamrous, Marie-Ange Manier*, The effect of planning horizon length and green manure on net income in Crop Rotation Problem, p39-50
6. *André Mbairanodji, Founadoudou, Daquin Cédric Awouafack, Garba Bouba Boïga*, Towards the digitalization of Cameroonian agriculture: current situation, challenges and prospects, p51-57
7. *Vinablo K. Dominique Dagbelou, Souleymane Bah, Souleymane A. Adekambi, Jacob A. Yabi*, Bibliometric and economic analysis in precision agriculture, p58-67

Scientific Committee

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