
REVIEW OPTIMIZE AGRICULTURE USING ARTIFICIAL INTELLIGENCE

Written by Lukas Walser – reviewed by Viviane Aicher

What is this paper about?

The short paper describes that artificial intelligence can be used to prevent crop failures using a convolutional encoder network to classify infected plant leaves. To do this, a data set of 50,000 images of healthy and infected leaves of crops is used to train the network and classify whether a disease is present and, if so, what type of disease it might be.

Actuality of Topic

In his introduction, the colleague describes that today's growing population structure and the changing climate situation led to challenges in conventional agriculture. Therefore, new methods such as machine learning could address problems such as productivity bottlenecks caused by crop destruction by parasites. Thus, the actuality of the topic is given.

Technical Quality

The paper provides a short overview of the way convolutional neural networks and autoencoders work. Afterwards it describes in detail the workflow and outcomes of a proposed model for the image classification of leaf disease. The manner in which the PlantVillage dataset was collected, as well as a proposed manner of data collection for efficient future use of the model, are not specified.

Potential Impact

The future use of such a model, e.g., by means of image recording by a drone, could definitely help to localize infested plants at an early stage and to treat them in a targeted manner in order to avoid major crop failures.

Insightfulness, Depth & Clarity

The colleague provides a high-level insight into the topic of classifying infected plant leaves to avoid crop failure and briefly explains the technical terms as well as the proposed convolutional encoder network so that potential readers can follow and understand the main points of the topic. The paper is well-

structured into an introduction part, a part explaining crop disease detection via classification, another part explaining the architecture of a convolutional neural network and an autoencoder, a third part with the model explanation and its results and a final part with the conclusions. The data sources used are quite recent, however the main insight of the convolutional encoder network derives only from one paper.

Reproducibility

All references are stated correctly and are cited in the paper. All-important requirements concerning the quotation style are met. Thus, the paper is reproducible.

Summary

The colleague presents a well-structured paper relating to a current topic explaining a complex convolutional encoder network model and its implications for crop destruction avoidance.

Comments & Improvements

Good Job! The paper is well structured and easy to read. There are some minor aspects that could be addressed such as the data collection of the images for future use and the discussion of other possible models and their results in comparison to the one stated. Some correction proposals are included in the attached paper.

Final Decision

Minor revision – 18 points

The colleague presents a well-structured short paper relating to a current topic. There are some minor aspects that could be addressed such as the data collection of the images for future use and the discussion of other possible models and their results in comparison to the one stated. I would maybe change some wordings in the paper and believe that the colleague has earned himself 18 points.