

A Literature Review of Precision Agriculture: Applications of Diagnostic Diseases in Corn, Potato, and Rice Based on Artificial Intelligence

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Abstract : The food loss production that occurs in deficient agricultural production is one of the major problems worldwide. This puts the population's food security and the efficiency of farming investments at risk. It is to be expected that this food security will be achieved with the own and efficient production of each country. It will have an impact on the well-being of its population and, thus, also on food sovereignty. The production losses in quantity and quality occur due to the lack of efficient detection of diseases at an early stage. It is very difficult to solve the agriculture efficiency using traditional methods since it takes a long time to be carried out due to detection imprecision of the main diseases, especially when the production areas are extensive. Therefore, the main objective of this research study is to perform a systematic literature review, of the latest five years, of Precision Agriculture (PA) to be able to understand the state of the art of the set of new technologies, procedures, and optimization processes with Artificial Intelligence (AI). This study will focus on Corns, Potatoes, and Rice diagnostic diseases. The extensive literature review will be performed on Elsevier, Scopus, and IEEE databases. In addition, this research will focus on advanced digital imaging processing and the development of software and hardware for PA. The convolution neural network will be handling special attention due to its outstanding diagnostic results. Moreover, the studied data will be incorporated with artificial intelligence algorithms for the automatic diagnosis of crop quality. Finally, precision agriculture with technology applied to the agricultural sector allows the land to be exploited efficiently. This system requires sensors, drones, data acquisition cards, and global positioning systems. This research seeks to merge different areas of science, control engineering, electronics, digital image processing, and artificial intelligence for the development, in the near future, of a low-cost image measurement system that allows the optimization of crops with AI.

Keywords : precision agriculture, convolutional neural network, deep learning, artificial intelligence

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