IDENTIFICATION OF RICE CROP DISEASES IN SRI LANKA USING COMPUTER VISION

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Rice Diseases detection system using computer vision.

Abstract

Sri Lanka is a country where agriculture has taken a significant place for ages, and rice crop cultivation plays a substantial role in the country's economy. At present, farmers are used to following traditional methods and approach officers to identify diseases. In most cases, due to the complexity, the period used to determine the disease is being high, resulting in too late to minimise the losses that will be done and sometimes a high amount of chemicals are used to recover the cultivation. Currently, Brown spot, Leaf-blast, Rice Hispa are a set of widespread diseases leading to massive destruction of harvest in paddy cultivation. Several already existing algorithms have been compared, and the best suitable approach for this task was selected, which is the accurate identification of these three diseases as per the data gathered by various government institutes that are related to paddy cultivation. The resulting outcome of this project will ensure the ability of the farmers to detect rice diseases without being dependent on others since reaching out to officials is also hindered by the current COVID-19 Pandemic. For this task, an already existing dataset containing the mentioned diseases was found and processed with officials' help. And then, a VGG16 model architecture was further optimised and fitted into this task of identifying rice diseases. Then the solution is embedded in an easy to use a cross-platform mobile application to capture and upload images directly from the users mobile phone to obtain precise and fast visual identification and detailed instructions on the diseases which affect the paddy harvest each year, creating a new Ecosystem of RICE community. The author was able to successfully implement the proposed solution which can easily distinguish between the targeted diseases and also provide with a community features that can be used to reach officials.

Keywords: Transfer Learning, Neural networks, Image Processing, Rice Disease detection, Convolutional Neural Networks, Paddy Diseases