

# **DEEP LEARNING APPROACH TO DETECT TEA LEAF DISEASES IN SRI LANKA WITH IMAGE PROCESSING**

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## **Abstract**

The agriculture sector in Sri Lanka has always performed a major economic force making a specific contribution to the national economy. Tea production in Sri Lanka has become one of the major sources of foreign exchange for Sri Lanka and Black Tea can increase the human immunity against virus such as COVID-19.

Tea leaf diseases have become one of the critical problems in Sri Lanka and it causes that degrades the quality and reduces the quantity of the tea. So, this leaf disease affects to the normal state of the plant inefficiently which modifies or damages its major functions such as fertilization, etc. The classical and old method for reconditioning and detecting plant diseases is based on naked eye observation and it is a very slow method also gives less accuracy. Also, there is not enough experts to identify the diseases and time consuming due to availability of experts.

In order to efficiently detect and prevent tea leaf diseases, Convolution Neural Network (CNN) was used with image processing. Firstly, the dataset was created with the guidance of the experts from TRI. Then, removing background, resizing images data augmentation were used to preprocess the images and these photos were inserted into the network. The iteration numbers have been changed periodically and the dropout has been correctly applied to overcome the over fitting problem and to achieve higher accuracy of CNN. Two models were created and one of them was able to get 82.31% and other got 74.14%. Hence, the CNN based algorithm can be used in image classification and can effectively increase the identification performance of tea leaf diseases by expanding the dataset.

**Keywords:** Disease images of tea leaf in Sri Lanka, Image recognition, Deep Learning, Convolution Neural Network, Neural Network, Classification