IDENTIFY TEA STEM & BRANCH DISEASES FOUND IN SRI LANKA USING IMAGE PROCESSING

Janith Attanayaka

A dissertation submitted in partial fulfilment of the requirements for
Bachelor of Engineering (Honours) degree in Software Engineering

Department of Computing

Informatics Institute of Technology, Sri Lanka
in collaboration with
University of Westminster, UK

2021

Abstract

Sri Lanka's agricultural sector, based on major crops such as Tea, Rubber, and Coconut, has always been a direct contributor to the national economy. Out of these, Sri Lankan Tea has huge popularity and demand in the world and hence more foreign exchange is coming into the country. Black Tea, one of the most popular teas in the world, is produced in Sri Lanka. The cultivation in Sri Lanka, which is of such great value, is currently declining due to the deterioration of quality due to Tea Diseases. Among them, Tea Stem & Branch diseases play a major role. Tea Stem & Branch diseases adversely affect the general condition of the tea plant and cause symptoms such as reduced yield and stunted plant growth. It is also possible to contact domain experts in the field of tea cultivation to control these diseases, but it is a very difficult task as they are very limited.

The system was created using image processing and CNN (Convolution Neural Network) to identify tea stem and branch diseases and minimize the damage caused by them. The dataset was created by the author under the guidance of domain experts in the Tea Research Institute. The images selected for the dataset were adjusted correctly by changing the image backgrounds and sizes. The dataset, which was created using pre-processed images, was mounted to a model and then trained.

The model was trained several times and its test accuracy was tested and the model was trained until a very good test accuracy was obtained. The trained model showed an accuracy of 94%. It is therefore clear that the use of CNN-based algorithms for image classification is more appropriate. Further expanding the database will make the diagnosis of tea stem and branch diseases more effective.

Keywords: Tea Stem & Branch Diseases, Deep Learning, Image Classification, Image recognition, CNN