IMPLEMENTATION OF RELATIVE COLOR CALIBRATION METHOD AND K-NEAREST NEIGHBOR ON SMARTPHONE FOR COLOR ACQUISITION ON LEAF COLOR CHART

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Abstract

Smartphone technology has become one of the most owned by all people. One of the frequently used features from smartphone is the camera. Leaf Color Chart (LCC) is one of the tools that used by farmers to evaluate the condition of the plant, such as determining nitrogen needs of crops and the health of the plant. Farmers use the LCC by compare the color of the leaves with green color level on the LCC manually.

The use of smartphone’s camera can help farmers to evaluate the condition of the plant. LCC and leaves of plants captured using smartphone and then automatically compare the color of the leaves to a level corresponding color in LCC. Before able to compare the color of the leaves with colors level at LCC, it is necessary to test the feasibility of the camera used. Smartphone camera is feasible to be used if the levels of color in the LCC can be acquired.

Based on the above issues, a system is built to test the feasibility of camera used using relative color calibration method and k-nearest neighbor for the acquisition of color levels contained in the LCC.

Average accuracy of the experiments performed above 83%, which means that the camera can distinguish at least five of
the six levels of color on LCC recorded with smartphone camera with a variety of lighting conditions. These results indicate that current smartphones can acquire color levels contained in the LCC with variety of lighting conditions when shooting the image.

**Keywords:** Color Acquisition, K-Nearest Neighbor, Leaf Color Chart (LFF), Relative Color Calibration, Smartphone.