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Custard Apple Leaf Parameter Analysis, Leaf Diseases, and Nutritional Deficiencies Detection Using Machine Learning

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Abstract

Custard apple (Annona Squamosa L.) is the oldest fruit plant in the dry land. It is begun from a tropical area of America and widely disseminated all through the tropics and subtropics. The custard apple fruits are cultivated in many states in India on a commercial scale. Disease detection and health monitoring in a plant are essential for sustainable agriculture. Nutrients play a crucial role in influencing tree growth, fruit production, and fruit quality. It is arduous for human vision to identify the particular leaf disease and nutrient deficiency by naked eyes. In this paper, an attempt is made to propose a system for leaf parameter analysis, detection of N, P, K deficiencies, and leaf diseases. K-nearest neighbors (k-NN), and Support vector machine (SVM) algorithms are applied for the classification of leaf deficiencies and leaf diseases. Database of 125 and 80 Custard apple leaf images are used for leaf diseases and deficiencies, respectively. Experimental results showed that the proposed leaf parameter measurement system had attained 99.5% accuracy. This paper exercise a supervised machine learning approach using image processing.