

AUTOMATED COCONUT TREE DETECTION USING UAV IMAGERIES

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Coconut being one of the major plantation crops in Sri Lanka plays an important role in the economy of the country. It accounts for approximately 12% of the country's agricultural production with 395,000 hectares of land area under cultivation and an annual production of 2,500 million nuts. In order to achieve optimal productivity and profitability in coconut estate management an analysis on number of decisive factors associated with the cultivation such as healthiness, quality, area, canopy coverage, stage of growth and bulk of production in both quantitative and qualitative aspects is vital. The availability of accurate information on the crop distribution, exact plant locations and the quantity of plants will be instrumental in the efficient management of nutrition, fertilizer, irrigation and labour. Feature extraction techniques on remotely sensed imageries can be used to identify individual coconut plants. The employment of conventional satellite remote sensing for coconut tree extraction is not efficient due to some flaws in this method such as comparatively low spatial and temporal resolution, higher dependency on weather conditions etc. UAV remote sensing is competent in addressing the above mentioned flaws with its competency in flexible data acquisition. In this study Template matching method was used for the recognition of coconut trees in the captured drone image. The demarcation of boundaries of the coconut trees were performed using Watershed segmentation method. The validation process was performed using a set of collected ground truth data which resulted an accuracy of 90%. This study can be further developed for recognition of coconut trees with irregular shapes and discrimination of the trees of other species with similar shape as of coconut trees.

Keywords: *Coconut tree detection, Coconut tree detection, Template matching, Watershed segmentation*