

Semi-Automated Weeds Identification and Watering System Using Machine Learning: Based on Cabbage Crops

D.D.B. Senanayake* and R.M.T.C.B. Ekanayake

Department of Science and Technology, Uva Wellassa University of Sri Lanka.

**Corresponding Author E-mail: durangadbs@gmail.com, TP: +94766844268*

Fast-growing novel technologies influencing the world's different industries with innovative solutions for the issues arising to simplify the human workload and to avoid time consumption. In the Sri Lankan context usage of novel technology in the agricultural industry is not at a satisfactory level and weeds can be identified as a major problem agricultural field. Manual weed identification and removal methods are still using and it needs a lot of human workload and time. This Semi-Automated system was developed for plant and weeds identification and watering the crops using machine vision and machine learning technologies. Raspberry pi model B+ was used as the controller with camera and python with OpenCV is used for programming. This system was developed based on the cabbage crops and Bayesian classification and Mahalanobis distance for non-diagonal classification was used for recognition of plants. The plant watering mechanism works on the identification of plants this is an autonomous mechanism. This robotic system can be controlled through Bluetooth and it is able to ride through different field conditions. 85% of accuracy in the identification of plants and weeds is achieved in conducted trial runs using this system. Implementation of the system will enhance crop cultivation and cost, time reduction of the farmers in Sri Lanka. The system is successful in the trial runs and it will develop with the robotic arm for weeds removal in the future with this identification. Results manifest that farmer can use this system for their crop cultivation as an effective method in Sri Lanka.

Key words: Artificial Intelligence; Machine learning technologies; Watering; Plantation; Weeds Management