

## An Application of Transfer Learning Techniques in Identifying Herbal Plants in Sri Lanka

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### Abstract

Sri Lanka has a considerable collection of plant species that have been utilized for generations as medicinal treatments. Knowledge regarding herbal plants is restricted mainly among practitioners in traditional medicine. Available systems studied; had no proper methodology to search information regarding herbal plants, which can be identified through analyzing an image of an herbal plant given. Systematic literature review was done based on herbal plants in Sri Lanka, transfer learning and plant image recognition and two open ended interviews were conducted with traditional medicine practitioners. As main objective of the study, reorganization of Information was done building a technique to enhance capability of identifying herbal plants based on deep convolutional neural networks and image processing techniques which would ultimately assist more locals with identification. Five herbal plant types were chosen to analyze further in detail and the images of the plants were acquired from web and also images photographed via 13MP camera creating a data set validated through traditional medical practitioners. Images were preprocessed and retrained on Inception-v3, Resnet, MobileNet and Inception Resenet V2 based on transfer learning. Algorithm was fine-tuned using image processing techniques for preprocessing and prototype was tested 5 times reaching highest average accuracy of 95.5% on Resnet for the identification of 5 different plant types. Conclusively, this study enhanced the capability of searching herbal plants by reorganizing the information.

**Keywords:** *deep convolutional neural networks, transfer learning, Inception-v3*