

Identification of Teak Wood Cupboards in Sri Lanka using Machine Learning

W. L. G. D. Sandunima^{1*}, and R. S. Wickrama Arachchi¹

¹ *Department of Information Communication and Technology, Faculty of Technology, University of Ruhuna*

**dashini.sandu@gmail.com*

Abstract

Teak timber, scientifically referred to as *Tectona grandis*, is a timber species of exceptional value celebrated for its outstanding characteristics and wide-ranging uses. Teak wood cupboards hold significant value in the furniture industry, particularly in Sri Lanka, due to their durability, aesthetic appeal, and cultural significance. However, distinguishing authentic teak wood cupboards from imitations can be a challenging task, for both consumers and experts. This research presents a novel approach to address this issue by leveraging machine learning techniques for the automatic identification of teak wood cupboards. This study is confined to categorizing a collected dataset of 1060 cupboard images from furniture shops in Sri Lanka through image preprocessing. In this study, a machine learning model, specifically a Convolutional Neural Network (CNN), was developed and trained on a dataset of images of teak wood cupboards and other imitations of wood. The CNN model can recognize distinct features and patterns that differentiate genuine teak wood from other types of wood. The model's performance is evaluated, and the results indicate an accuracy of 89.5%, demonstrating its effectiveness in teak wood cupboard identification. To mitigate the limitations posed by a relatively small dataset, data augmentation technique was employed to prevent overfitting. Model performance was assessed using metrics like precision, recall, and the F-1 score. Additionally, it can contribute to the preservation of teak wood resources by discouraging the use of counterfeit materials on the market. The proposed model offers a promising solution to the problem of identifying teak wood cupboards in Sri Lanka, addressing both economic and environmental concerns.

Keywords: *Teak wood, Cupboard Identification, Machine Learning, Convolutional Neural Network*