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In Collaboration with

UNIVERSITY OF WESTMINSTER

**Analysing Traditional Varieties of Sri Lankan Rice Seeds using
Computer Vision**

MSc Project Report by

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Submitted in partial fulfilment of the requirements for the MSc in Advanced Software
Engineering degree at the University of Westminster.

May 2023

Abstract

The preservation and conservation of traditional rice seed varieties play a crucial role in safeguarding biodiversity, ensuring food security, and sustaining cultural heritage in Sri Lanka. However, the identification and classification of these traditional rice seeds pose a significant challenge due to the lack of a systematic and efficient method. Traditional identification methods rely heavily on manual examination, which is time-consuming, labor-intensive, and prone to human errors. Furthermore, the diminishing knowledge and expertise in identifying these seed varieties among the younger generations exacerbate the urgency of finding a solution. Therefore, this research aims to develop a computer vision-based tool for the automatic identification of Sri Lankan traditional rice seed varieties. By leveraging the power of image processing and machine learning algorithms, this tool seeks to enhance the efficiency and accuracy of seed variety identification, contributing to the preservation and promotion of Sri Lanka's rich agricultural heritage.

This thesis presents a novel approach to address the problem of identifying Sri Lankan traditional rice seed varieties using computer vision techniques. A dataset comprising 8000 high-resolution images for each of the six selected rice seed varieties was collected and used for training and evaluation purposes. Image processing techniques, including image segmentation, thresholding, and feature extraction, were employed to preprocess the images and extract relevant information. The features considered for analysis included RGB color value, HSV color value, length, width, area, perimeter, and shape of the seed. Support Vector Machine (SVM) classifier was chosen as the machine learning model for its ability to handle high-dimensional feature spaces. The trained SVM model was integrated into a responsive web application implemented using PHP Laravel for the backend and HTML5 with CSS for the frontend. This system enables users to upload images of rice seeds and automatically classify them into one of the six traditional varieties, thereby streamlining the identification process and promoting the preservation of Sri Lanka's agricultural heritage. The experimental results demonstrate the effectiveness and accuracy of the proposed approach in achieving reliable seed variety identification, contributing to the advancement of computer vision techniques in the context of traditional rice seed conservation.

Keywords: Agriculture, Rice Seeds, Sri Lanka, Machine Learning, Image Processing, Computer Vision, SVM, Supervised Classifier, Dikwee, Madathawalu, Hondarawalu, Pachchaperumal, Ranthambili, Rathel

Declaration

I hereby declare that this project report is my original work and has not been submitted in whole or in part for any degree or qualification to any other university or institution. All sources of information and data used in this research have been acknowledged and referenced according to the guidelines provided by my university.

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Data: 15/05/2023