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Guava Plant Disease Identification using Deep Learning

A dissertation by

Miss Thanumi Thihansa Mudalige

W1761883 / 2012819

Supervised by

Miss Malsha Fernando

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Abstract

Agriculture plays a very significant role in the day today lives around the world. The agriculture domain goes through many challenges like nutrition deficiencies, climate changes etc. Plant diseases are the biggest threat to the agriculture domain. It is an absolute necessity to protect these plant from these diseases that may result in massive crop and economic losses. These challenges can be overcome by identifying and controlling the problem at an early stage, but the identification should be accurate. However, the agricultural community lacks knowledge and an agriculture officer may be unavailable for days after the farmers' contacts, these challenges still exist and should be overcome before it's too late.

Various research has been conducted on identifying guava plant diseases in the following years. However, there are more research gaps to be fulfilled that have been identified by this research and will be willing to achieve throughout this research. A deep learning-based approach is proposed in this research and to classify the guava plant diseases using a combined dataset. Out of many pre-trained models in Keras, DenseNet 121 was chosen for the initial implementation considering the requirement elicitation methodologies.

DenseNet 121 was considered a better model compared to the others. The accuracy between the two models is 95% and 90% based on the testing accuracies. It is highly important that the accuracy is high. However, this approach can be enhanced further to make more contributions in the agriculture and data science domain.

Subject Descriptors:

- Applied computing → Computers in other domains → **Agriculture**
- Computing methodologies → Artificial intelligence → **Computer vision**
- Computing methodologies → Machine learning → Machine learning approaches → **Neural networks**
- Computing methodologies → Machine learning → Machine learning algorithms **Ensemble methods**