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ABSTRACT

Transfer learning, on the contrary, is a machine learning approach that utilizes a previously trained machine learning model to produce a new model that is used to tackle a distinct but interrelated problem. When a smaller data set is available and computational capacity is limited, using a pre-trained machine learning model to generate a new model is more efficient way to approach the problem.

In our implementation we will be employing a machine learning model MobileNetV1 that is pre-trained with Image- Net database .In addition to this will also be Fine-Tuning our model, where we will be freezing the initial layers of the model except the last 5 layers and re-training the model to classify the images based on the new data with a very low learning rate to detect the quality of fruits and vegetables.

Image classification plays a vital part in the detection and segregation of fruits for their quality by considering parameters such as color, shape, deformation and scabs. We compare two techniques, and Transfer Learning, to develop a model that can do these tasks quickly and efficiently. With an accuracy of 92.66, the technique requires a large data set, as well as a lot of computing power, GPU, and time. When given a small data set, low computing resources, and a GPU, transfer learning performs better, with an accuracy of 95.42 in substantially less time. By evaluating the model, we can affirm that a combination of Transfer Learning with fine tuning enhances the performance of the classification model.

**Keywords**: Fruits, quality ,image classifier, shelf life.

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