

# CHAPTER 1

## INTRODUCTION

### 1.1. Background

Banana is a fruit that we often see everywhere, and many of us consume bananas. Banana is one of the leading agricultural product from indonesia. This fruit is very popular in the community because it is easy to get anywhere at the price offered is also very affordable and bananas are also easy to consume starting from the age level of babies to parent. Many of us don't know what the ideal level of ripeness for a banana is, As we know if a banana is yellow meaning it's ripe but is many type of banana ripeness.

The conditions of the banana fruit is determined by several parameters, one of which is the level of maturity seen from the color of the peel it self and the maturity divided into 3 parts starting from the green, yellow, and blackish yellow banana. Bananas are generally differentiated by manual methods, using humans to classify them, but along with the development of computer technology that has entered the agricultural sector, both from the pre-harvest to post-harvest aspects, this is where the problem is, how to recognize ripe and immature bananas accordingly. Desired at post-harvest time.

Classifying the lever of fruit maturity generally has many algorithms such as K-NN, CNN, Naive Bayes, and many more but in this case it will implements the CNN (Convolutional Neural Networks) algorithm. Convolutional neural networks is a research method commonly used to classify or recognize an object in an image. Convolutional neural networks is usually used to identify an object in an image. The way it works is to reduce teh size of an image and after shrinking it will be inserted into a layer to convert the image into an array which will be processed to next stage and in the last process a prediction will be made that will know what objects are in the image.

## 1.2 Problem Formulation

Based on the background of research above, the problem of the study is:

1. Can CNN being used to classification the ripeness of banana?
2. Accuracy can be obtained by using CNN?
3. Comparing Adam, RMSprop, and SGD optimizer

## 1.3 Scope

This research are aimed to classification the ripness of bananas using CNN method and the goal of this research is to analyze experimental results using some datasets with variety of images. The scope of the studies are limited, for example the used images is only bananas.

## 1.4 Objective

The goal is to test how much accuracy, and do a comparison of which optimizer is suitable for this project, how precise the classifications it can make with CNN method to classificate the ripeness of bananas fruit.

