

CHAPTER 1

INTRODUCTION

1.1 Overview

Almost as soon as digital computers became available, it was realized that they could be used to process and extract information from digitalized images. Need of accurate grading, sorting of fruits and foods, or agriculture products arises because of increased expectations in quality food and safety standards. This is being assessed through visual inspection by human inspectors. This process is tedious and time consuming. After hours of working the operator may loose concentration which in turn will affect the evaluation process. The farmers are very much affected by this manual activity in terms of returns for their crop. Hence these tasks require automation, so as to have a computer vision system as an alternative to this manual practice. Automated system of sorting food and agriculture products provides rapid and hygienic inspection with computer vision. Computer vision and image processing are non-destructive, accurate and reliable methods to achieve target of grading. Machine Vision Systems are successfully used for Identification and Classification of plants, leaves, flowers, bulk grain samples. In order to perform this task of pattern recognition by machines, considerable design effort is necessary. Characterization models were based on morphological features, color features or textural features. After isolating the grain, the region of interest was selected around the boundary of the edge. The morphological features were obtained from the binary images containing only pixels of the grain edge. Grain quality is a term that refers to the quality of grain. However, what constitutes quality depends on the use of the grain .Overall quality of grain are affected by several factors which includes, growing practices, time and type of harvesting, postharvest handling, storage management and transportation practices. Food is a basic need of life. Without food no one can survive. So, it is a basic need to have food daily which should be of good quality. As India is a highest producer of wheat and rice (agriculture) across the globe, people don't get good quality of food. The quality of food is an important factor for proper nourishment and today's market should be free of adulterated food grains. These

grains consist of several impurities like stones, damaged seeds, broken granules etc. The addition of impurities in food affects the composition and quality of food. There is no convenient method to identify these inferior quality grains in the market. Human perception based on visual inspection has long been recognized as a guide to quality assessment but the results are not accurate and reliable. To overcome this problem, image processing has been used to classify food grains according to its quality. The challenges are: x Quality issue x Automation in quality assessment. Our system divides food in three classes i.e. good, bad and medium according to training.

1.2 Motivation

Quality of grains is an important requirement for today's market, to protect the consumers from substandard products. The government imposes price control for essential commodities in order to protect the consumers from black marketing and inflated prices. As a result some traders unethically release sub-standard products to the consumer market. Because of such practices there are so many inferior quality grains arriving to the market day by day. These grains consist of several impurities like stones, damaged seeds, more broken granules etc. This is often seen today in rice trade where rice of low quality is sold without being noticed. However, there is no convenient method to identify these inferior quality grains in the market. Therefore, this has become a serious issue for both the consumer and the government. Hence an automated quality analysis of the food grains which are distributed could be considered to be extremely helpful.

1.3 Problem Statement

The Traditional System to distribute the food grains in FPS is obsolete and is not liable. This system proves the inability of the bureaucratic setup which has failed to deliver good quality grains to the needy. The aim of this project is to overcome the failures of the present system and to design an automated grain recognition which performs quality analysis of rice grains using its features, which classifies the type of grain and its quality and grade.

1.4 Objective

- The aim of this project is to develop a real-time application that can classify the type of grain given according to its quality.
- To do so, capture the image of the grain using a digital camera.
- Store them in the database file, read that database file and then pre-process the image.
- Then perform segmentation to extract each grain image. Extract the features from each segmented image, store the extracted features in feature vector for training.
- Build the Probabilistic Neural Network (PNN) for training and recognizing the grain type and its quality. Finally, test the system by giving different images as input.

1.5 Summary

The intent of this project is to address and try to minimize the food adulteration and contamination of the ration distributed to the poor and the needy, in possession of Below Poverty Line (BPL) card holders by deploying smart sensing devices with Internet of Things (IoT) to preserve the quality and quantity of food grains stored at warehouse and packaging with appropriate quantity and assigning barcode for each package and commodity. In this project a real-time application that can classify the type of grain given according to its quality is developed. The BPL card holders will be advised to open the sealed package after the ration card is validated.