Final Year Project Report

Project Name:

Intelligent rice grain analyzer

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Dedication

This research paper is lovingly dedicated to our respective parents who have been Continual source of inspiration. They have given us enthusiasm and determination. Without their love and support this project not has been possible.

Final Approval

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ABSTRACT

Agriculture is the biggest industry as Pakistan is declared an agricultural country. Rice as the part of basic food is consumed by population of world. Lot of researches had been done upon this staple food. Rice being a major crop is source of earning foreign exchange for Pakistan. The quality products are being appreciated and promoted around the world. In past most commonly quality evaluation had been done through Human inspection. The factors like recrimination, favoritism, human error were the key points for decision making [1]. It was a time consuming procedure and not an authentic source to be trusted as it contained a lot of drawbacks. To overcome those limitations, we shall be developing software by using image processing and computer vision. It shall be analyzing the quality of rice grain in terms of its morphological parameters like length, width, area, total number of objects; small, medium, large, broken and yellow rice grain .It classifies the nation of rice like basmati, tota, kernel or super kernel using automated technique. The major methodology that are removal of noise, detection of edge and segmentation of each rice grains. Firstly, scanned image of rice has to be taken for image acquisition and then that scanned image shall be proposed for noise removal. Then edges had to be detected through Canny Edge Detection technique. We shall be measuring morphological parameters like length, width, area, total number of objects, small, medium, large, broken and yellow rice grains through our algorithms. Classification of nation of rice shall be done by comparing our obtained values with manual values recorded and measure the accuracy percentage through weka software. Our software will be a low cost solution for quality assessment and classification of nation of rice not only in agriculture sector but also in export industry.

DEFINITIONS AND ACRONYMS

Acquisition: action or process of gaining something.

Accuracy: something that is free from mistakes, correct or exact.

Architecture: structure of anything, blueprint.

Artificial: something which has not occurred naturally rather than created by human.

Assessment: evaluating, judging something, analyzing.

Assumption: something accepted without any proof, something assumed.

Analysis: examination, investigation of something in detail.

Automation: use of automatic equipment, technology to run the processes.

Average: adding all the quantities and dividing by the total number of quantities.

Backbone: foundation, major source of support for the system.

Binarization: process of converting pixel image into binary image.

Binary: number having two possibilities either zero or one.

Canny edge detector: edge detection operation used for detecting edges of wild Range.

Centroid: the center of mass, object.

Classification: arrangement or categorizing of something.

Computer vision: branch of science and technology that obtain information from images.

Contrast: the difference between minimum and maximum pixel intensity of an image.

Contribute: give something in order to achieve something, help for achieving something.

Corruption: dishonest dealing, fraud, or use unfair means achieving for something.

Data: facts and figures collected for analysis.

Database: large information that is organized so that is accessible managed and updated.

Debug: identify and remove error or bug from hardware /software.

Dilation: structure element used for probing and expanding shapes.

Domain: area of interest or an area over which a person is having control.

Drawback: problems or disadvantages.

Edge: boundary or contour of image.

Effective: having desired results.

Erosion: shrinks image objects.

Exporter: a person, company for sending goods to other country for sale.

Extract: remove or take out.

Features: attribute or characteristics.

File: an object that stores data.

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1. INTRODUCTION

Rice is one of most increasingly growing crop in world [2].Pakistan being a nation is the largest producer and exporter of rice hence our research and development work in this direction would help a lot for Pakistan rice industry. It is investigated that how the quality of rice can improved and how the export corruption can be stopped. There are a lot of problems that are being faced while exporting rice .In today's time there are few software available worldwide for quality inspection and classification of nation of rice. But they are so expensive that traders and Mill owners had pay billions of rupees each year. A large part of their income is being invested in it. Pakistan is among the list of underdeveloped countries and our agriculture sector is our backbone. We decided to work upon this project through which we can contribute in the economy of Pakistan. Inspire of depending upon others by exporting software from abroad. We should have our own software that can help to solve our problem. We designed software that will be able to calculate like length, width, area, total number of objects, small, medium, large, broken and yellow rice grain. Software classifies nation of rice based on morphological parameters. This research paper presents automated rice quality measurement technique in which data has been calculated through Hp Scanjet G3110 scanner in form a scanned rice as image. Secondly, we had remove noise through preprocessing techniques and for edge detection we had used canny edge detection technique. Thirdly, we had designed algorithms to calculate morphological parameters like length, width, area, total number of objects, small, medium, large, broken and yellow rice grains. We had to compare the obtained values with manually recorded values as standard. Lastly, we classified the nation of rice based on dataset of obtained values with the help of the software known as weka. Our research methodology was to get the knowledge of related work already being done by other experts in this field. It helped a lot in developing the software. The rice is exchange with low quality ones on borders. The software can be made to secure the kinds of mixing or exchange. There many research papers which applied various techniques to analyze the quality of rice grains. This software will be used by the rice industry. This software will quality of analysis of rice grains to rice industry as Pakistan is the largest exporter. It will also help Pakistan rice industry in automation of rice work and will contribute in economy.

This project was important for our rice industry to grow and develop. This software will help both the suppliers and producers of rice. It will also help the government to check the quality of rice and identify the nation of rice being exported. It will be useful in agriculture sector of Pakistan.