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Rice Quality Analysis Using Deep Learning

[1]Sowmiya. S, [2]Asso. Prof. J.Jayapandiyan

Krishnasamy College of Engineering and Technology

ABSTRACT:

Rice is the most consuming food all over the world and the market for rice is always high. In rice manufacturing industries the market demand is always centered on quality of rice.

In the evaluation of rice quality the examination of physical dimensions like length, width and thickness plays an important role. Traditional methods used for detection these factors are time consuming and imprecise as they are done manually. This paved the way for development of computerized vision in rice quality inspection. In the proposed method both image processing and machine learning techniques are clubbed to analyze and grade the quality of rice kernels with the help of Support Vector Machine (SVM) classifier in python platform.

Introduction:

Analyzing the quality of rice is one of the vital roles in machine vision. Several researchers suggest that object shape is more information than its appearance properties such is more color vary between objects instances more than the shape. But it cannot give an accurate result. It can also identify the rice integrity problem. Rice integrity means touching of seeds while taking samples. The main purpose of this method is to offer an alternative way for quality control and to analyze the quality of rice which reduce the required effort, cost and time. The rice quality plays an important role in the production of agronomic and horticultural crops so identification of the quality of rice is very important. Image processing is a significant and advanced technological area where important developments have been made in tradition the farmers.

Existing System:

Rice quality is nothing but the combination of physical and chemical characteristics. Grain size and shape, chalkiness, whiteness are some physical characteristics while amylose sklearn. pre processing
The paper presents a solution of grading and evaluation of rice grains on the basis of grain size and shape using SVM in machine processing techniques and specifically edge detection algorithm is used to find out the region of boundaries of each grain.

PROPOSED SYSTEM:

Rice quality is nothing but the combination of physical and chemical characteristics. Grain size and shape, chalkiness, whiteness are some physical characteristics while amylose content, gelatinization temperature and gel consistency are chemical characteristics of rice.
The paper presents a solution of grading and evaluation of rice grains on the basis of grain size and shape using SVM in machine processing techniques and specifically edge detection algorithm is used to find out the region of boundaries of each grain.

System Modules:

Module 1: Dataset collection
Module 2: Preprocessing
Module 3: segmentation
Module 4: Feature extraction
Module 5: Analysis quality

Module 1: Dataset Collection and Pre- processing

A dataset (or data set) is a collection of data, usually presented in tabular form. Each column represents a particular variable. Each row corresponds to a given member of the dataset in question. It lists values for each of the variables, such as height and weight of an object. Each value is known as a datum.

We have chosen to use a publicly-available Healthcare dataset which contains a relatively small number of inputs and cases. The data is arranged in such a way that will allow those trained in medical disciplines to easily draw parallels between familiar statistical and novel ML techniques. Additionally, the compact dataset enables short computational times on almost all modern computers.
The sklearn. preprocessing package provides several common utility functions and transformer classes to change raw feature vectors into a representation that is more suitable for the downstream estimators.

In general, learning algorithms benefit from standardization of the data set. If some outliers are present in the set, robust scalers or transformers are more appropriate. The behaviors of the different scalers, transformers, and normalizers on a dataset containing marginal outliers is highlighted in Compare the effect of different scalers on data with outliers.

Module 2: Preprocessing

Standardization of datasets is a common requirement for many machine learning estimators implemented in scikit-learn; they might behave badly if the individual features do not more or less look like standard normally distributed data: Gaussian with zero mean and unit variance.

Scaling features to a range

In practice we often ignore the shape of the distribution and just transform the data to center it by removing the mean value of each feature, then scale it by dividing non-constant features by their standard deviation.
For instance, many elements used in the objective function of a learning algorithm (such as the RBF kernel of Support Vector Machines or the l1 and l2 regularizers of linear models) assume that all features are centered around zero and have variance in the same order. If a feature has a variance that is orders of magnitude larger than others, it might dominate the objective function and make the estimator unable to learn from other features correctly as expected.
An alternative standardization is scaling features to lie between a given minimum and maximum value, often between zero and one, or so that the maximum absolute value of each feature is scaled to unit size.
This can be achieved using MinMaxScaler or MaxAbsScaler, respectively.
The motivation to use this scaling include robustness to very small standard deviations of features and preserving zero entries in sparse data

Normalization

Normalization is the process of scaling individual samples to have unit norm. This process can be useful if you plan to use a quadratic form such as the dot-product or any other kernel to quantify the similarity of any pair of samples.
This assumption is the base of the Vector Space Model often used in text classification and clustering contexts.

Module 3: segmentation:

Data Segmentation is the process of taking the data you hold and dividing it up and grouping similar data together based on the chosen parameters so that you can use it more efficiently within marketing and operations.
Data quality measures the condition of your data, using factors such as accuracy, consistency (in all fields across data sources), integrity (whether the fields are complete), and usability. An exemplary score in all these fields equals high-quality data, the best kind to use for processing and analysis. Data quality analysis. Data quality analysis is the final step in the data understanding stage in which the quality of data is analyzed in the datasets and potential.
FUTURE SCOPE:
An image processing-based solution is also explored from the published literature for automatic rice recognition, classification, and recognition of foreign particles from images using color and texture features. There is a necessity to select the most appropriate techniques to assist in decision-making. The image processing techniques have been used widely across agricultural contexts. It can be an effective tool in food quality assessment. There is a number of applications and methods to select for implementation to real-time needs.

CONCLUSION:

The image processing techniques have been used widely across agricultural contexts. It can be an effective tool in food quality assessment. There is a number of applications and methods to select for implementation to real-time needs.
r automatic rice recognition, classification, and recognition of foreign particles from images using color and texture features.

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