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MACHINE LEARNING MODEL FOR CLASSIFICATION OF RICE VARIETIES USING HYBRID FEATURE SELECTION SCHEME

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Abstract

This research presents a classification, artificial intelligence base rice. The design and achievement of artificial neural network system that extracts specific shape and texture features from rice classification. Rice of three kinds is presented in this research. Modules of significant of rice image features are identified using a texture feature selection technique and neural network. We have three categories and each category have been samples and we have 90% train and 10% test disjoint data sets and then classify. The future technique inherit range and direction invariance through difference near the reflection data sets as well as it be able to manage effectively even through rice. Sample to be distorted suitable toward quit before owing to a integer of whole drill in them. A considerable a extremely towering organization relation of 90% toward 90.1% be achieve, still with for the classification misshapen rice grains.

INTRODUCTION:

Chapter 1

Rice is the mainly vital foodstuff of the globe. More than 900 million of the globe community depend going on top of rice as producer or customers (BhavesB.Prajapati 2013). Rice is major seed for a huge part of the world people specially inside Pakistan because rice be the main food of Pakistan. The most consumed crop in the world is the white rice. White rice is the very important food stuff used for a large of the global people. Special foodstuff products are made from different classes of rice. (Madan Mohen& George W. Norton 1992) It has been observed that in recent century mostly population depend on food made product. The food difficulty determination develops into at the same time as important as environmental problem. The global rice research organization (IRR 2000) considered the food stuff difficulty relation to the globe people, as well as they predict to 800 million bags of rice resolve (VidyaPatil& Male Math 2015). Digital reflection giving out application has been greater than before used signed for investigation of superiority of food stuff objects. Quality control be one of the significant topics in foodstuff industry because, after harvesting, food and graded in different grades based on the quality parameters. Currently the quality of rice is estimated logically and manually through the implement in automotive industry (Imangolpour et al 2014). Inside planned in the direction of obtain high-quality of rice original, the rice should exist clean during helpful method before in the direction of device image be able to perform its work. Rice superiority assessment by uncovered eye be inefficient, therefore there be several systems as well as

technology existing toward perform the classification of rice. (Wanputri et al 2015).

1.1 Problem Statement:

Human vision base identification of different verities is difficult, because due to over work burden, fatigue, and lack of domain knowledge of different verities. So inside the study we have been annoying toward increase the automatic as well as half automatic organization or different rice grain verities identification.

1.2 Objective

The main object of this study be the study that can easily presence of rice classification using machine visualization approach. The most important focus of this research be near achieve the research goals .It is the structural features of rice classification. It is has been rice texture features color, shape and size undesired items. It has been based on network classification and image processing and data mining. It has been the texture feature image processing identify the rice grains. It is to identify dissimilar variety of rice through with mechanism Intelligence classification be use by Pakistan on top of conventional based, it have a few draw backs similar to as Lack of human information newest varieties as well as their growth charge utilize by dissimilar environmental factors like sunlight, water, different fertilizers and usage of local resemblance of different varieties as a result human found observation be difficult task toward recognize these varieties as a result I include introduce machine intelligence in the direction of recognize these varieties. There is much delimitation which affects the research.

- Noise
- Temperature
- Air
- Light Intensity
- Human judgment

Chapter 2

Literature Review:

Different researcher contains purposed dissimilar approach used for organization dissimilar plant as well as contains dissimilar results. We include perform a UN supervise categorization of the ground envelop within the rice increasing area of the stream delta. Our consequences specify dissimilar stage of the rice crop be able to be discriminate through combine ERS and RADARSAT SAR images. The reading be on the subject of the classification of cotton also sugar cane crops base on top of super natural performance of their plants. Neural Network (NN) is at the bottom of gear for image dispensation during some categorization troubles and it nearby a potentially attractive option in image dispensation. DayalTalukdar& Love Chile (2014) suggested that the study used mainly primary data collected through a field survey. The standard manufacture rate of rice for each acre in the conditions of contribution utilize diverse transversely the three rice crop while glowing since crosswise the a range of stage of rice gardening.[MdAnumulHaque& M .MoynulHaque 2016] There cognized market place break down in the rice marketplace in for of wheel more than the rice market place through organization of rice trader.. Everyone the countryside house hold be concerned through rice marketplace as seller or buyer or equally .The learn as well that recognized advanced lose knowledge able through little farmers as of this market place because they frequently sell the rice throughout the crest session at minor price and buy the rice throughout bend period on advanced price. Mega R. Siddagangappa and as so. Prof. A. H. Kulkarni (Aug -2014) discuss in this paper they require used intended used for the development of quick, exactas well as objective classification designed for excellence purpose of food stuff grain. The grade of rice similar as complete according toward the dimension of the granule most important part and presence of impurities (Sheikh Salim et al 2009) suggested that the production of rice we use of ground better seed and fertilizers contribute toward the speed of insignificant output growth should address the incentive schemes of labor. (S.J. Mousavirad& K. Nasri 2012) The authors suggested so as to an algorithm designed for classify the variety of bulk samples are presented. The put of skin controlled disused, noisy or still unrelated in sequence. This work presented an efficient model for identification of rice varieties using bulk samples distribution pattern. A support

vector machine classifier was designed for rice classification using all extracted features. The author is recommended with the other intelligent classifiers like artificial neural network. (NurulHoque Choudhury &Nazmul Hassan 1998) The author proposed that the research relevant toward the Bangladesh rice base go on a diet contain dietary survey inside country Bangladesh in village by means of dissimilar manufacture pattern, The majority significant food rice, angle and vegetables and bio availability study of starch from rice and calcium as of little home-grown angle. Rice contribute that such because a big quantity of the dietary quality of rice varieties. Our studying determination exist pursue through study rice, angle and vegetables' individually and jointly in a complete diet. (Sigeru&Mitsuaki Yano 2014) The author suggested that the classification of rice plant region through with distant sense information. The categorization technique is base on top of a spirited neural system and the satellite information are remote sense data experimental previous to and behind plant the rice. (David Lewis &Manik L. Bose 2003)The SOM categorization be useful the RADARSAT and SPOT to estimate the rice plant area because opinion, so the neural network be helpful designed for the categorization of the satellite data by SAR toward estimation the rice area. The future study we determination be relevant this neural network as well as extraction rice plant area.

(NorhaidaHussin&ZawZawHtike 2015) The author discussed that the method that used signed for rice trade by image dispensation. The different approach has been useful through different researchers toward explain dissimilar type of difficulty within grade the superiority of rice. Piece of equipment idea have been worn within the majority function of rice grader in the direction of discriminate rice score base on top of individual skin such as figure, length, shade and inside injure of rice. There are many method can be use toward mark the superiority of rice in the manufacturing, image processing by machine vision have been established obliging in distinguish rice grouping. The method and knowledge be able to forever be move on as one by means of the growth of other knowledge as the technology gives large force on the way used. (Rubi Kambo& Amit Yerpude 2014) The discussion of dissimilar skin texture rice granule and a series of method accessible for categorization of basmati rice. The paper future that a new major part study base move toward for classification of dissimilar variety of basmati rice. The new answer is that show that the efficiency of the future method for a range of sample of dissimilar variety of basmati rice. (S.phadikar& J. Sil 2012) It is suggested that rice be the extensive lyre fined in expensive yield in the globe. Throughout farming the first and precise analysis of the rice stand disease and that intelligent to decrease the injure resultant surroundings safety and improved go back. Inside the employment an automatic organization have been industrial for detect two dissimilar types of rice disease. Instance difficulty of the bay classifier .O (NXD2) where as for the support vector machine. It is O (NXD2) anywhere mains is the measurement of the characteristic vector and N be the digit of preparation sample. Since number of samples usually a great deal better than the measurement of the characteristic vector. (C C Teoh & B. H. Abu Bakar 2008) The author suggested that the. We used this method counting for fertilizer management to achieve high target yield. (prof.V.B.Raskar et al 2016) in this study that. Hence we those. A gmark consistency of rice have been future on the base of machine vision mostly we use image processing toolbox of MATLAB for grade of rice grain. The article illustrates a latest technique. Which be noncritical for excellence assessment.

(CHETNA V. MAHESHWARI & CHINTANK.MODI 2012) The author suggested that superiority evaluation of grain is a very huge challenge. The answer of excellence assessment and grade of rice manufacturing intended for excellence evaluation be distinct which is usual don through the manually and individual supervisor. The superiority analysis of Gujarat-17 rice seeds via image analysis. This paper defines the calculating area and length and calculates fresh technique. Which is nondestructive used for superiority investigation. The occasion in use to get, such results areas well very less which

obviously depict its important in the world of automation. The main problem of quality analysis is the time consuming. (TarulataShapla et al 2015)This paper proposed that rice cultivated rice types. The examiner be able to be use because foundation for constant map of rice and connected ground treatment by satellite images to determination be helpful for monitor the ground make use of situation on local as well as general scale. (Federica & Monaco Guido Sali 2016) In hope, more long expression study cover wide rare a will be give precious information on the power of weather change on the farming situation and food safety in the kingdom. (Peng Wan) The thesis planned a uncovering technique of rice procedure excellence by the color and BP neural system. A rice excellence discovery machine base on computer idea to obtain rice image a loop of the radius R in the stomach of the rice be firm as a color characteristic origin area.(BikshmanGujja&T.M.Thiyajarajan 2009) The normal shade of every subregion H be taking out because the color quality value describe in the outside method excellence of rice. Inside this thesis, the technique of detect rice method excellence be established by test based going on the shade and BP neural network. The rice images be obtain after that exact shade character is tic taking out region and after that the color characteristic. (Snehas.S.Kausal et al 2013) The paper proposed that, the excellence of grain be a significant condition in the direction of protects customers from substandard products. Rice be the main nutritional fastening used for other than partly the world's population. It is the meant for the most part well-liked worldwide supply power, carbohydrates, protein, fiber, necessary vitamins and natural resources and advantage antioxidants.(Jagdeep Singh Aulakh&Dr. V.K. Banga)During the previous 30 year's rice use every one more the humanity have additional then double. There are so many lower excellence grain arises to the marketplace day by day. Nowadays rice in buy and sell, rice of near to the ground excellence is sell with in organism notice. This have turn into a grave subject designed for mutually the customers and the administration. (Bhavesh B. Prajapati& Sachin Patel 2008) The plan of this the soybean the direction of optional algorithm intended for quality of Pakistan Basmati Rice. Using representation giving out technique. Digital reflection dispensation be able to categorize the grain through pace as well as correctness. We talk about the dissimilar parameter worn used for study of rice grain as well as how algorithm be able to be use toward calculate as well as evaluate them through conventional standard. The paper defined as software scheme development through such algorithm provides shortest measurement of excellence of rice grain. Web able to propose a low down price instrument for excellence study of rice grain. (Masayoshi Kubo &MinjmaaPurevdorj 2004) The paper proposed that, rice use increases by the populace. in the21st century, a big populace add toward in predict. Mainly of the enlarge determination happen in Pakistan and Africa where the people live lying on rice. There be lots of indication the food stuff difficulty determination develop into because significant while the green difficulty.(MUHAMMAD ASIM SHABBIR& FAQIR MUHAMMAD ANJUM 2008) The examine seek toward explain the potential connection of give as well as exact of rice, which be closely linked through Asia. The global rice investigate organization (IRRI 200) study the food stuff difficulty in there lative toward globe people and they deduction to 800 million of rice determination exist necessary in 2025.the foodstuff and the farming group (FAO) report to international rice manufacture is now growing through 1.3% a little a smaller amount then 1.9% increase speed among 1984as well as 1994as well as the imagine manufacture toward attain 424 million loads as well as classify toward 422millionbagsin 2005 (FAO 2000). As the word people increase, thus do the consumption during 2030 through by means of estimation form used for the quantity of rice manufacture and use world people will augment to 827 billion public in 2030.Rice manufacture exceed use inside Asia as well as America equally of which determination go on to exist export area. (SheetalMahajan et al 2014) the paper suggested that, excellence of grain be necessary intended for defensive the customers as of inferior products since the sample of food

stuff equipment be subjected toward provide solution toward the difficulty of rice manufacturing used for excellence examination. Workstation based idea inspection provide single substitute used for quick, precise suitable and damage techniques. The prospect effort force exist toward accurate the things of the non-uniform clarification and be relevant to the a range of factor for the excellence investigation of the Pakistan basmati rice grains so while to organize them in to usual, undersized and long rice kernel. (Amogha B &UjwalaPatil 2015) this paper suggest that the field of agriculture weed is an unwanted plant. It is the resources of crop such as the water, Pesticides, and grown as that the traditional method at farmers use more amount of similar pesticides all over the field and it is results in decrease of the soil fertility. In this paper we provide frame work to classify crops and weed using image processing techniques. The classification is satisfactory when the area of weed is less than the crop. We can reliably classify the images as weed and crops so it can be implemented to real time application. The weed and crop should not be overlapped on each other which help to classify weed and crops. (K. Vasantha Kumar, ValliKumari 2013) the paper proposed that it is the third most cultivated cereal crop in India. Nitrogen is the maser nutrient required to attain maximum yield for maize. Managing nitrogen to mach the crop requirements is very most important. The leaf color chart (LCC) is a instrument to provide an evaluation of maize's order intended for nitrogen. Throughout the real difficult it was that the inconsistency of analysis was extremely negligible compare the leaf color chart to the industrial image processing function. The function is talented to conquer awareness and color leaning to us LCC. Applicability to other crop as the leaf color chart adopt as normal in this purpose in only useful to maize. Multiuser functionally since the submission do not have the aptitude to differentiate one user from a new which strength that to a dissimilar maize inhabitants. (BakhytAkhmedov& Alan J. Stern 2006) The the sis planned to the Brazil has develop into a maser player in the globe. Soybean markets secondly the Pakistan harvest area is about 10 million hectares.

There is a require for precise on the recently extended agriculture area in Pakistan and the existing total manufacture. The result suggested that it be able to exist use for prepared application of MODIS 250 m data for categorization because well as possible in harvest give in evaluation. A conclusion hierarchy algorithm base on the kernel harvest penology was productively use to classify the main harvestre fined in the province in Punjab. (F. Guevara- Hernandez et al 2011) The paper proposed that the organization be practical to the categorization of yield and barley grain kernel. The result obtain allows the researcher to close that in the categorization of yield grain kernels. By means of the accessible structure a elevated sorting correctness be able to be get. The service morphological, shade, and surface facial appearance type jointly offer improved correctness then the service of single one quality type. The system weeds seed presence in lots of seeds. The service of superior integer of skin price and might decrease sorting . (Lanlan Wu et al 2009) The paper proposed that, it is the classifier device in the direction of classify the we din to hard skin field on before time development phase image segmentation be complete by transform unique shade images according to the statically principles of ruby, olive and navy mechanism principal part examination was use to choose the quality skin according to their superior aid to decrease area scope. The capability of support vector machine technique to recognize in the grass land wild flower or hard skin images in the early increase phase. The (SVM) classify associate by means of more features provides enhanced accuracy. The support vector accuracy. The support vector machines method in resolve sorting harms of accuracy farming. (Rajesh K Dhumal et al 2013) The paper discussed that the crops identification from remote sensing . Multispectral and hyper spectral images contain. Spectral information about crops. Various researchers have been worked with supervised and unsupervised classification and support vector machine and they have been found different results with different dataset. (MandeepSaini&NeelamPrakash 2012)

The paper suggested that the globalization grain is the most important basis of vegetable protean than other cereals like as maize, corn, rice and wheat is used for total production as food. P is the second country as to wheat because the major human being fare yield and also maize to determine the superiority of wheat be dangerous. The superiority of wheat physically require an specialist and also time overriding. Image dispensation be able to be use to categorize wheat according to its quality,image processing have been productively adopted used for the excellence examination of rice, breakfast cereal grain, fruit as well as vegetables. The food processing operations as increased computer capabilities image processing be recognize because organism the center of computer image by means of the development of more efficient algorithm and their greater implementation of this technique. image analysis base 0nquality, morphology and color feature granule manufacturing as well as bias of wheat module toward asses granule excellence as well sin the direction of notice creature huge number. (KatariaBhavesh 2015) the paper proposed that grain be the exacting significance organism a product yield. Nearby are many issue into the indentifying dissimilar variety of rice. Digital image processing move toward have been devise into order to examine dissimilar type of individuality of identify dissimilar rice variety. There are four important varieties ordinary be use into test for significant skin, length, relation and paddy and dry. The digital image processing analysis has provided to that quantitative characterization of rice grains. Chocolate and pasty rice variety is by a grouping of descriptors as well as feature the relation. The classification of rice base on more precise guideline supplies intended for convinced rice variety. Such as Basmati. The utilize of outside feel and concentration skin be appropriate to the classification of pallid region in crushed rice. The recognition for the description of rice grain might have fun a very important role for the food stuff manufacturing in the prospect.(MS.Kiran R. Gavhale& Prof UjwalaGawande 2014) In this paper suggested that the discusses in plants cause maser production and economical losses as well as reduction within equally excellence and magnitude of farming crop. at the present a day's place disease uncovering have conventional growing interest in monitor large grassland in crop. The farmer is toughly control diseases to another we require of easy place vegetation diseases discovery system to would make easy advancement into agriculture.(Donn H. B eighley 1995) Now a day's near the beginning in sequence going on crop physical condition and illness discovery can make easy the manager of disease through proper organization strategy. The major techniques intended for detection of plant disease are BPNN, SVM. The technique be use to analysis the well and unhealthy vegetation. The system for a precise place leaf disease and mechanization of the method for permanent under that the real world field conditions. It is suggested that the illness discovery method show a good quality likely with an ability to detect the place leaf disease and a number of limits therefore, we improved the scope in any research. (TranthiThanhHai& Le ThiLan 2015) The paper proposed that the automatic categorization of grain variety used for rice kernel manufacture by the mainframe image and reflection dispensation technique. Rice seed of dissimilar variety be visually very comparable inside shade, form as well as surface to make the categorization rice seed variety on lofty correctness challenging. The Images of six dissimilar rice seed variety inside northern be acquired and analyzed. our focus is that visual analyzing facial appearance of rice kernel imagery because color, figure , surface and we can apply dissimilar features. Our employ ment be able to deploy that rice seed production vegetation inside vitnam to help the assessment of rice seed for its quality. (TsvetelinaDraganova&PlamenDaskalov 2010) The paper proposed that it is an approach for identifying of single maize of infrared region. The maize grains classification is based on (SIMCA) soft independent modeling of class analogy. It is a classifier and neural network (NN). It is the credit correctness which is achieve for both program of grains is in that order. To identify single corn kernels infected with based on the absorption of seed and obtained by their reflection. Using SIMCA is comparatively high-quality correctness

to organize maize grain into to two module strong and impure. (B. Mahendra Kumar & DR. Karthik S 2014) It is the statically model be able to be obtain and that quality wavelength to be applicable intended for the division of grain. The most excellent accurateness of classification used for equally program of maize and grain strong and contaminated at what time the haunted information be obtain on or after the further part of the granule. (Abirmi.S&Kala.H2014) The paper proposed that the processing of imagery of the diversity calculated within this attempt for extract features beginning rice granule considerably of the grade difficulty. Neural network prototype credit tool and functional in the grain rice granule. There is a urban neural network be able to be modified for grade additional grains and food stuffers since fine. The neural network is capable to organize healthy and at what time present is no overlap of granule through the correctness of 98.7%. The granules are examination is perform on basmati rice granule. The image processing and neural network prototype gratitude instrument which is implement base on the skin extract from rice granule for classify grade of granule. Digital image processing the skin from rice granule in a non-contact form images acquire for rice by camera. The morphological skin extract from the image are agreed to the neural network prototype gratitude tool. The production of image processing reduced the time of achievement and improved the harvest classification considerably. (Veena. H &Latharani T R 2014) The paper suggested the farming manufacturing is as well oldest and most extensive manufacturing in the globe.

Quality evaluation of rice grain is a extremely large confront. The thesis presented the evaluation method for determined of excellence of broken up rice3. The broken up rice sample the excellence of broken down rice kernel. Grains be said to be kernels length is 75% of the granule dimension. This technique give high-quality outcome in assessment of rice excellence. To perform classification of broken rice kernels this method be faster and simple. It is also more accurate than the human visual inspection methods all the quality in food by image processing.(Kadir& Mustafa Akkaya 2016) The paper proposed the seed data set from machine learning database are used. In this paper we are separated the wheat seed from each other in the seed data set. We separated the data by methods of KNN. While wheat seed data received from machine learning and database classified. In the data set including attributes of rose, Canadian and wedge wheat classified and success rates were found higher than when the classification was made by multilayer algorithm. The wheat kernels are required to separate from each other due to the fact that they grow with each other and they have differential, financial returns. The properties of data set of wheat consist of perimeter area, height, length, and radius. (VidyaPatil& V. S .Malemath 2015) The paper proposed that rice that inception assessments grain . We consider technique grains to be. (S. Phadikar J. Sil 2012) The paper proposed that grain be extensively used refined inexpensive harvest inside the globe. Through out farming the initial and precise analysis of the rice set disease. In to employment, an automatic classification have been urbanized to categorize the piece of paper blast disease of rice plant based on the plant causes. In this employment an automatic classification have been urbanized designed for detect two dissimilar type of grain illness. The primary phase unifected and the unhealthy vegetation are confidential base on top of the digit in the histogram. The classifier as well as SVM is applied to categorize the piece of paper disease. The quantity of sample usually a large amount better then the measurement of the skin vector. Consequently to the future organization is occasion well-organized contrast to the SVM. (FaranakGhobadifar& Mustafa NeamahJebur 2016) The paper suggest that the increase of rice pets such as BPH (Brown plant hopper) in steamy area of the most excellent identified factor. Distant sense can hold accuracy undeveloped practice for formative the site of spreads and using insect killer in the correct place. Inside arrange to notice BPH in the meadow and by remote sense data in pests discovery. Satellite images with thermal band precise, Valuable, unique and resources of detecting the ecological factor and change and they can also access spatial skin of the vegetation.

This is information that type of weather data which is composed from station, and include greatest and smallest amount temperature and daily rain can be exactly connected with thermal remote sensing such as land sat or higher very high declaration radiometer (AVHRR) information be establish. (These information be able to exist utilize by permitting enhanced description of the spatial energy to equilibrium augment the spatial thickness at metrological stations. The learning show that SPOT images might be use to show the vegetation in the meadow by recognize chlorophyll satisfied and the quantity of emerald color in the vegetation which is cause by warmth. Transfer beginning individual enlargement phase in the direction of the additional for BPH was cause by high temperature. This analytical study should be development intended for detect vermin and diseases in agriculture field by use of dissimilar isolated sense strategy. Within adding, through have more yield information appropriate parametrical equation be able to be establish with the aim of predict weather factor which be able to added efficient on vermin of rice.(LalitPsaxena&Leisa J. Armstrong 2013) The paper suggested that the useful is representation dispensation technique the support researchers as well as farmers toward develop the agriculture practice.

Picturedispensationhavebeenusetowardhelpthroughaccuracyfarmingpractice Image processing technique contain be use across a vast range of agricultural production contexts. It can be effective in food quality assessment crop defect uncovering wild plant/yield categorization. Individual feature, which might ad growth of the representation dispensation technique intended for the cultivation be the availability of online datasets. No online descriptions database be available on food quality assessment fruit defects detection or weed/crop classification. Here be a require of farming database to determination easiness within trying as well as confirmation of recently industrial representation dispensation method.(R. Kiruthika&AzhaPeriasmy 2013) The paper proposed that the rice grain that the variety be calculated use image processing technique inside their employment a digital imaging move toward have be devise inside organize in the direction of examine dissimilar type of individuality toward recognize to the rice verities. Are the dissimilar frequent rice verities be use in tests for important that is contain accessible values intended for grain duration, region along with feature relation skin of rice.(Tiara Herman &Asgar Ali warsi 2015) It is productively show that efficiency its skin. At what time the information bottom of this employment be able to be familiar with the grain. MATLAB software organization urbanized by means of such as judgment algorithm provides straight evaluation of excellence of rice grain. I give all applicable parameter regarding rice grain by image examination. With a good choice of software gear, we be able to intend a small rate implement intended designed for excellence investigation of rice grain. In expectations, verities of rice grain determination exist in use and designed the region, distance end to end and form analysis in digital image processing. This work is additional often than not use in food stuff manufacturing.

Chapter 3
Material & Methods:

Rice is the kernel of the monocot orzo sativa. In Asia particularly because a breakfast cereal Granule, it is the majority extensively inspired fastener foodstuff intended for a big piece of the globe is human population. Basmati be extended granule perfumed rice grown for many Centuries in the exact environmental region.

Types of rice.

- Super kernel
- Super kernel kachi
- Super kernel paki

3.1 Image analysis

Data set.

Three samples verities of rice. Super kernel, Super kernel kachi ,Super kernel paki. Each verity has acquired 100 images data sets. I got 300 images for data sets of three different varieties

3.2 Image texture features

Image texture feature be a vital image used for telling property of objects into descriptions. Image Texture be able to be define like the spatial group of concentration variation into the figure at a variety of gesture . Length, such because the able to be seen and infrared portion of the field. Image surface into an significant part of figure textual facial appearance cooperate a main task inside figure investigation.

3.4 Texture analysis

3.4.1 Co-Occurrence Matrices:

Co-Occurrence matrix, as well well-known as grey -level spatial addiction matrix, of the mainly commonly use organization investigates resources. This technique of geometric arrangement in sequence identifies the grey-concentration spatial dependency inside a organization designed by different perspectives and range. Cooccurrence matrix consists of the location to they be computationally exclusive to build, and control high storage condition. Every co-occurrence Matrix summarize the wave length which a range of grey-level occur on a exacting collection as well as exacting positions beginning one more inside a image area. The matrix P(0,1) summarize the wave length through which grey-level occur on point 0levelas well as variety 1beginningsinglea further. For example. Each matrix feature contain the reliability used for two exacting grey-level values Factor P(0,1), (x, y) provide the reliability through which grayish stage x as well as y shown organize of 1 in the direction 0 level as of one a new. The dimension co-occurrence matrix determination exist the Variety of grey-level inside the pictures. In the direction of be able to restrict the dimension co-occurrence matrix, it is required toward restrict verity of grey-level inside the pictures. Co-occurrence matrix used for a specified variety be calculated for four pointed information, 0, 45,90, 135 levels. Using the majority characteristic significance of co-occurrence matrix be formed among the direction grey-level method from grey-level y to grey-level x. the four different grey level are as follows.

0 0 1 1
0 0 1 1
02 2 2
22 2 2

3.4.2 Contrast:

Contrast is the evaluate of comparison between a pixel and its around p, if the contrast 0 it Indicate that there is no difference in a picture method for state. It be continuous picture but present be discovered some difference within grayish stage after that operations be larger then 0. But the comparison co-effective provide great quantity then it show to present lots of difference discovered inside an shape.

3.4.3 Correlation:

Correlation be connection along with two principles. Co-effective of connection can be found connecting 1 to -1 If it give close to than it indicates to near by be beneficial connection connecting closest pixels. Principles as well as its importance near toward that it indicate powerful connection between them. So it is extremely assist complete toward categorize things from dissimilar curriculum.

3.4.4 Homogeneity:

Homoginity is measure level of likeness principles. An angled (GLCM) give a coefficient of Homoginity be 1 since(GLCM)be generally shaped after that it provide same principles when more than primary angled as well as less primary sloping.

3.4.5 Energy / ASM.

ASM located signed for Angular second momentum. This function gives huge cost but picture Be homogeneous. Homoginious indicates nearby be a huge amount of p cover the similar amount principles. But this function give helpful 1 after that it indicates pictures is continuous shape .Homogeneity, energy entropy, contrast and connection are the facial appearance is frequently use after we relate it toward draw out to functions. So it is essential to accomplish our focus on for this objectives feature extraction with cvip tools. C vip tools are the allows the customer to draw out features from item within the pictures. This is the done by using the unique and a segmented or

cover up the picture to determine the place of the object. The c vip tools software can be used for feature extraction in three ways.

1. Extract features for the entire image.
2. Extract features for an image object using segmented images.
3. Extract for an image object using a mask image.

Define texture then with common texture.

3.4.6 Gray level co-occurance matrix

technique be individual generally used geometric grain examination technique within witch quality characteristic be extract through a few arithmetic approach as of co- occurence matrix p(k,l). The make use of the co-occurance matrix be base going on the hypotheses that the equivalent gray level design is frequent in texture. This outline determination differ further through .

3.5 Haralic Parameters

The beneath conversation matrix (spatial grey-level co-occurrence matrices) (GLCM) be execute Not in a immediately line use within excellence application, even although these are use in the way of estimate basic second classify geometric parameter, as well as these parameter be use into distinction organization. Haralic*et-al.* defined the following 14 parameter; The every Haralics'parameter (statistical events) oblige in the path of both GLCM facet not a calculate, other than attractive a opportunity. The alteration of GLCM interested in occasion bench is called normalization. Expectation used for this principle every constituent of GLCM be separated during the sum of all elements. If N_{orms} the standardize form of the gray level co- Occurrence matrix over four angle 0°, 45°, 90°, and 135°.

Here N_{const} is normalization constant, which be able to be spoken as beneath.

Most of the texture calculation is weighted averages of the normalized GLCM cell contents. The weight is future to state the relative consequence of the worth.

3.5.1 Angular Second Moment (Energy)

consistency. standardized image is under reflection, then this consideration will have a large value. In other language homogeneity of the image is calculated by Angular Second Moment (ASM). It has high normal when window has either constant or in constant form. It way that it is uncorrelated to the first order arithmetic constraint such as diversity and difference.

3.5.2 Contrast

The contrast is a difference moment of matrix and it is a calculate of local variation nearby in the image. As this relative involve $(r-c)^2$ so its value changes exponentially by the distance from the main diagonal of GLCM. First order in order contrast and GLCM contrast are highly correlated. Similarly GLCM contrast and variation have a strong connection with first order statistical parameter normal deviation.

3.5.3 Correlation

$$f_3 = \frac{\sum_{r=0}^{N_g-1}\sum_{c=0}^{N_g-1}(rc)P_{norm}(r,c)-\mu_H\mu_V}{\sigma_H\sigma_V}$$

This parameter (Correlation) is a measure of gray level linear dependency in an image. By We szka*et al.*, it is the measure of degree to which rows or column of the matrix be related to each other. According to Arivazhagan*et al.*, for fine texture, the value of this parameter is better as compare to common texture, and it is uncorrelated to the GLCM energy, entropy and contrast. For a highly consistent texture it has maximum value.

Where μ_H ,μ_V ,σ_H and σ_V are the mean and standard difference of insignificant probability

3.5.4 Variance

This parameter provides a determine of irregularity in the preferred region of importance (ROI) of an image. If gray levels are consistently circulated increase normal take further evaluate distinction.

3.6 Inverse Difference Moment

$$f5 = \sum_{r=0}^{N_g-1}\sum_{c=0}^{N_g-1} P_{norm}(r,c)\,\frac{1}{1+(r-c)^2}$$

This factor be the calculate of restricted homogeneity. Its charged crease as space because of the main oblique increase and it is highest at major sloping. It has better charge used for a window with low contrast. It means that it is inversely correlated to difference; provide that energy is reserved stable. In the same way, it is also inversely connected to energy through the situation that difference is reserved constant.

3.7 Average

3.8 Variance

3.9 Sum

3.10 Entropy

$$f_9 = -\sum_{r=0}^{N_g-1}\sum_{c=0}^{N_g-1} P_{norm}(r,c)\log(P_{norm}(r,c))$$

3.11 Difference Variance

$$f10 = \sum_{r=0}^{Ng-1} (r - f11)2P_{x-y}(r)$$

3.12

3.13 Information Measures of correlation

$$HX = -\sum_{r=0}^{2Ng-2} P_x(r)\log P_x(r),$$

$$HY = -\sum_{c=0}^{2Ng-2} P_y(c)\log P_y(c)$$

3.14 Information Measures of Correlation

f_9 is the above section.

3.15 Maximum Correlation coefficient

$$\sqrt{\qquad}\qquad f_{14} = (\text{Second largest eigen value of } Q)$$

Where

3.16 Structure of the research:

We shall complete the introduction we describe literature review and it's divided in two different stages collect papers from different conferences. The literature review will described the methodology and that concepts present the different researchers include future unusual approach used for organization of Different seeds contain dissimilar results.

3.17 Research Design.

At home earliest footstep figure pre processing determination exist complete through apply dissimilar method similar to edge discovery sound backdrop take away, shade in the direction of aged height exchange etc. at

home next footstep image is analyze in by surface foot examination. After two on the conclusion through applying dissimilar mechanism knowledge future similar to Supervise as well as unsupervised categorization similar to artificial neural network (ANN), K nearest neighbour etc.

3.18 Data analysis techniques.

In my research data can be collect physically data collection for this work will be carried out using two techniques. Digital camera will be used to acquire photographic data for data analysis use matlab and cvip tools and provide the accurate parameters.

For this purpose available built in software cvip tool, Matlab etc.

3. 18.1Research tools.

- Cvip tools
- Mazda
- Matlab • Weka

3.19 CVIP TOOL:

CVIP tools, develop don the mainframe reflection as well as shape Dispensation laboratory at this time by Southern Illinois University by Edwardsville in the continuing direction of Dr. Scott E Umbaugh, is at this time available through the model digital shape Processing and examination Human and computer vision application with CVIP tool in second edition. CVIP tools 5.x is implementing in four layer, the algorithm cover, the common thing module (COM) edge layer, the CVIPOP layer, and the Graphical User Interface (GUI). The algorithms code layer is base mainly on preceding version of CVIP tools, consists of all image and data dispensation measures and function, and is written in C. the COM edge layer is written in C++ and links the CVIP tools C Functions to the GUI during the CVIPOP Class. The CVIPOP Layer written in C# provides an object-Oriented paradigm to consolidate data safety and recollection executive. The GUI layer, written in C#, equipment the image line, observer and manage user input and output. For improvement, CVIP tools 5.x include the CVIP lab atmosphere and the CVIP tools libraries. In adding to the regular C libraries. In addition to the standard C libraries a energetically linked library (cviptools.dll) is provide that contain all the COM Version of these functions. CVIP tools 5.x also contain two powerful progress tools that allow for batch dispensation and automatic algorithm examination and improvement. The CVIP-ATAT, Algorithm test and analysis tool be able to be used to test all combination and Values of parameter to speed front end algorithm growth. The CVIP-FEPC, feature extraction and pattern classification techniques. These are described in more Detail the length of with application example are in the new version of the primer Digital Image processing and investigation: Human and computer visualization application with CVIP tools second edition. CVIP tools version 3.9 is a UNIX in 32-based software wrap up and is a collection of computer imaging tools given that services to the user at the layer. At the bottom level are the CVIP tools Libraries (the application programming edge) base on the CVIP tools libraries are the cvip tool and cvip wish shell. CVIP tools 3.9 chains Variousflavors of UNIX because when windows NT/95/98/2000/Me. Version 3.7 is also available which chains more UNIX flavors.

CVIP tools with GUI:

- Image Segmentation-fuzzy mean histogram thresh holding, median-cut principal Components transformation cut, circular organize transform/center holed expressing level quantization, divide and combine.
- Morphological filter: It is a binary iterative morphology gray scale and colorErosion, dilation, opening, and concluding.
- Frequency domain filters- high pass, lopes, band pass, band reject, high frequency Emphasis and scratch.

- Features extraction, binary, RST-Invariant, histogram, Spectral, Texture, purpose features

- Feature analysis: Range normalization, unit vector normalization standard normalization

- Standard normalization, Min-Max normalization, Soft ax scaling, greatest value matrix.
- Pattern categorization: nearest neighbor, K-nearest neighbor and adjacent centroid.
- Spatial domain image restoration: order strain, mean filter, adaptive filter, filter
Included median adaptive median, minimum, middle, maximum, arithmetic, geometric, signify.
- Geometry transformation: user specified mesh, nearest neighbor, average exclamation.

3.19.1 Binary features: The following binary features are

3.19.2 RST Inverse features: The inverse features are

3.19.3 Histogram features:
- Mean
- St dev
- Skew
- Energy
- Entropy

3.19.4 Texture feature:
- Energy
- Inertia
- Correlation
- Inverse Diff
- Entropy

3.19.5 Texture distance Pixels Include zero pairs:
- Texture distance pixels include zero pairs are 1 to 6.

Spectral features get special features:
- Number of range 3 to 5 and number of sectors 3 to 5 **Laws of texture features:**
- LL
- LR
- LW
- LEE
- ES
- LE
- ER
- EW
- SS
- SR
- LS
- SW
- WR
- WW
- RR

3.20 Features Extraction

Implementation features like as many images counting GIF, JPEG, BMP, PNG while well as rare format can be read by CVIP tools. CVIP tools chains Standard shape for giving out functions. For example, representation compression, valid and geometric operation descriptions shape sharping manipulation, frame discovery, segmentation and arithmetic transformation. In CVIP tools some texture features are Binary, RST, Histogram, Texture and spectral features are explained.

3.21 RST invariant features:

Extracted features from the image are invariant. RST (Rotation, Scaling, and Transformation) Invariant features for image retrieval are investigated. Images change in to the scaling, rotation and transformations to transformation. RST features can gather results in all (rst 1 to rst 7) collectively and separately one by one rst feature selects.

3.22 Histogram features

Such diagram consist of rectangle which area is proportional to the frequency of a variable and its width is equal to the class interval is called histogram or a kind of Histogram to act while a graphical demonstration of the full sharing into a digital shape. Histogram is a way of summarized data that measured on an interval scale may be either discrete or continuous.

3.23 Texture Features:

Texture feature is used to describe the exterior distinctiveness and appearance of any object which show amount of its basic parts. Generally texture features disclose as a soft or hard, horizontal otherwise irregular, rude before fine, matt otherwise glossy, and so on. These are experimental on top of together non-natural or usual objects e. g wood, plants, materials and skin. Image quality gives us information concerning the spatial understanding of shade otherwise intensities within an image or select area of an image. Image texture be single technique with the aim of be able to be use toward assist in segmentation otherwise organization of image. Image textures can be produced from a captured image which is artificial or found in natural scene. Texture image in computer graphics can be analyzed by two methods structured method and statically method. A texture measure at every pixel gives values by used to segment the image in to region of similar textures.

3.24 Weka: Texture and spectral features are explained

Weka is a gathering of mechanism knowledge algorithm intended for the information drawing out tasks. The algorithm be able to both be functional straight toward a dataset otherwise call from your possess java cod. Weka contain mechanism for he information pre-processing, classification, weakening cluster, relationship system and idea.

3.24.1 Weka knowledge explorer:

Every of the main weka letters filter, classifiers, clusters, relations N quality variety is represent within the traveleralong side by means of a visualization tools which datasets and the prediction of the classifiers as well as clusters to be visualize within two dimensions.

3.24.2 ARFF File:

It stand for (Attribute-Relation File Formate) folder be an ASCII test heading that Describes distribution a place of attribute. ARFF files was developed through the machine knowledge development at the sector of computer science in University of Waikato for makes use of with the weka machine knowledge software.

3.24.3 Data miner:

Data mining is analysis step of knowledge discovers in databases process.

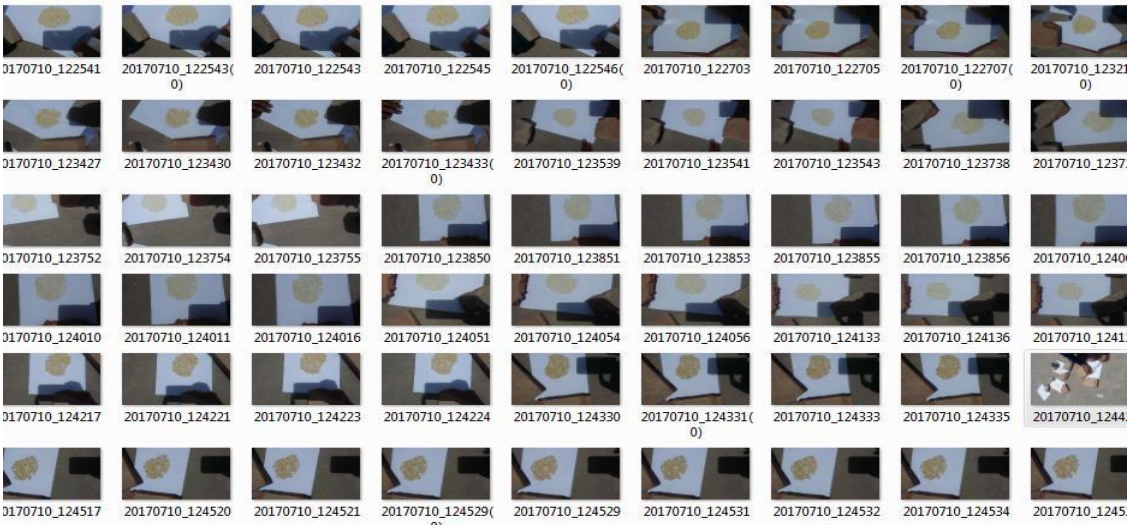

Fig 3.1 Sample dataset of rice with out crop

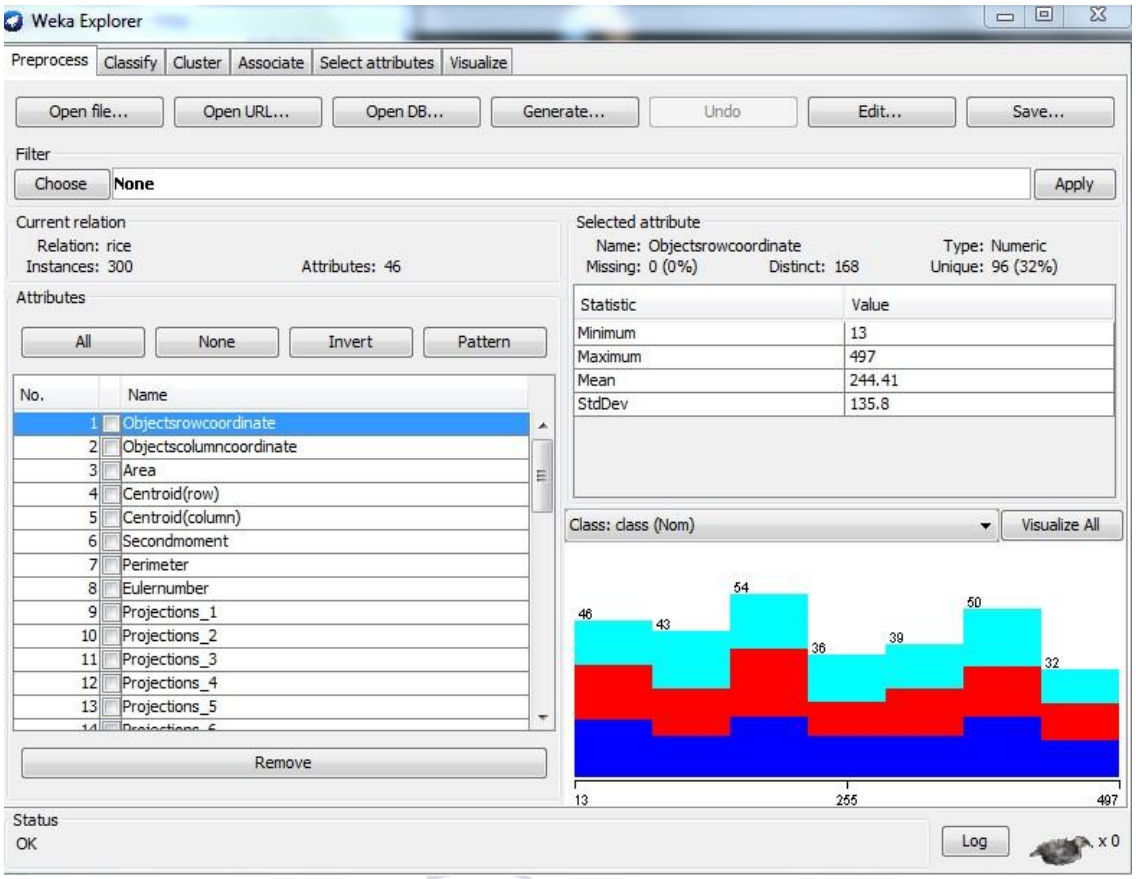

Fig 3.2 Weka explorer for the features selection

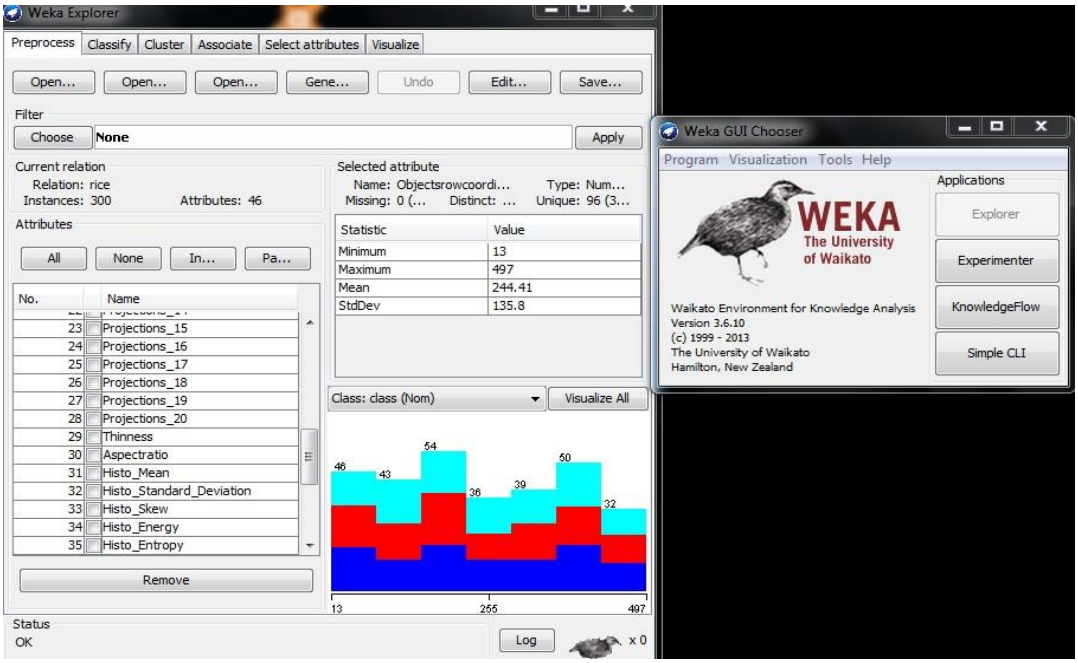

Fig 3.3 Weka interface for the classification method selection

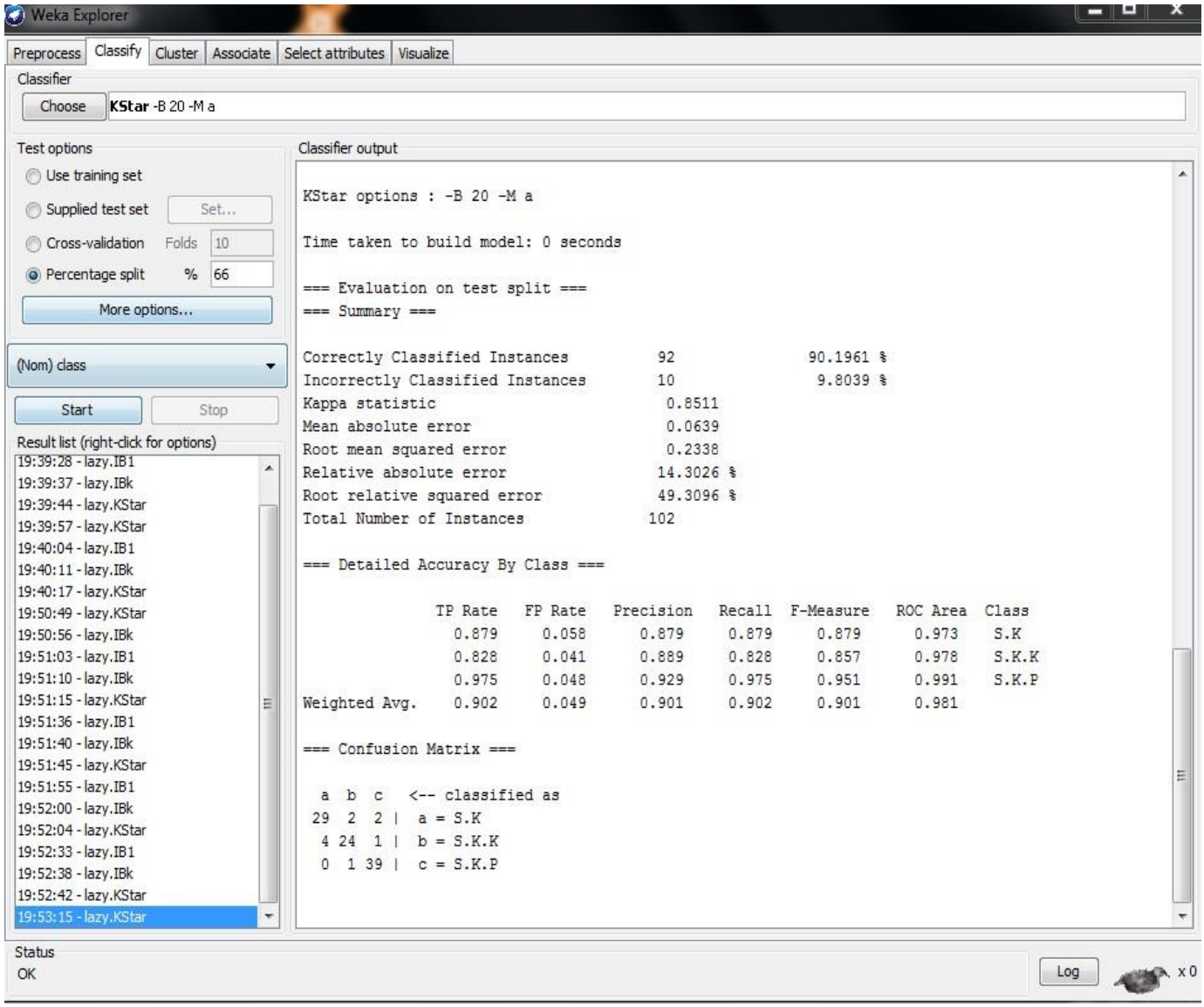

Fig 3.4 B11 PCA classification results

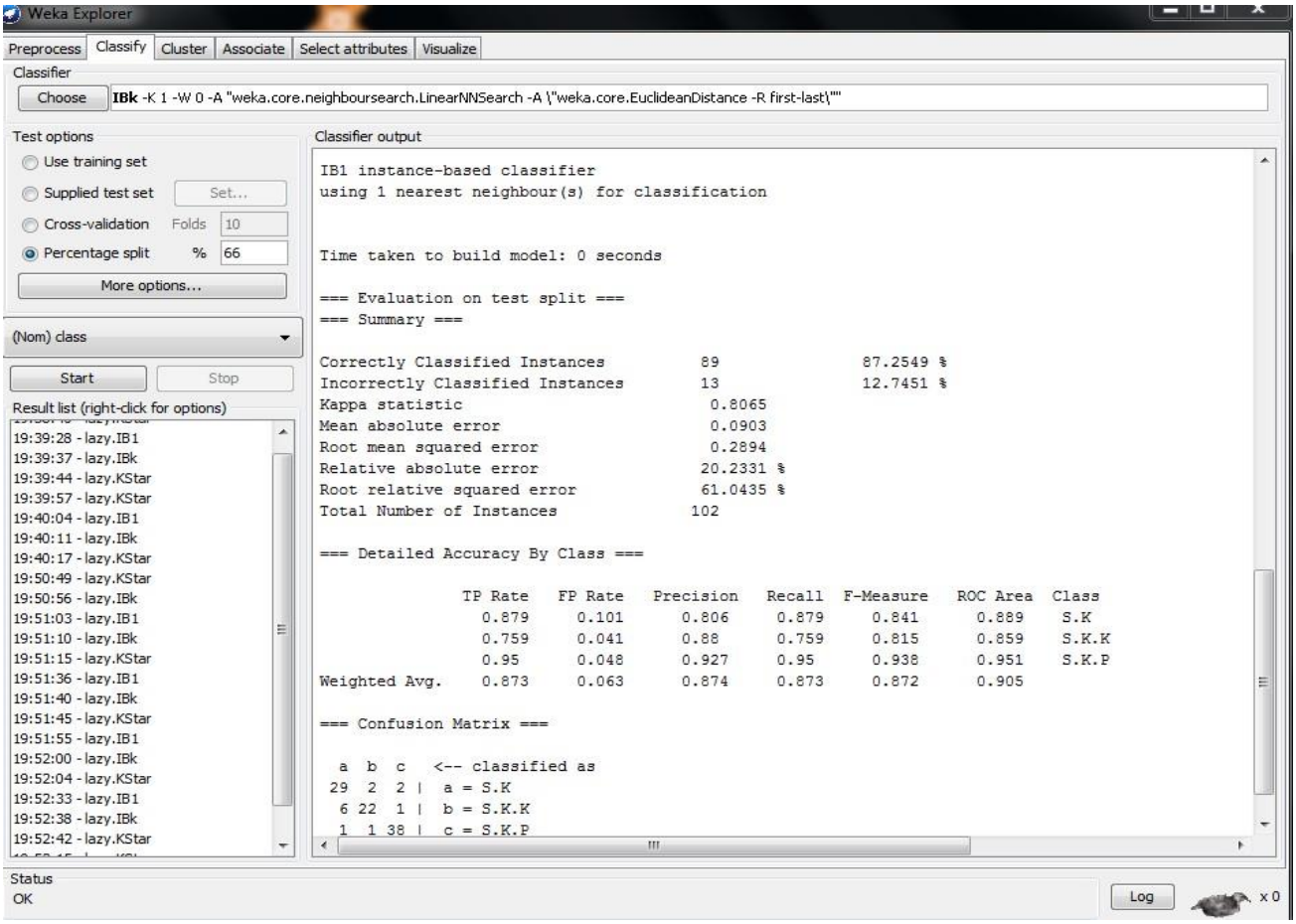

Fig 3.5 B11 LDA classification results

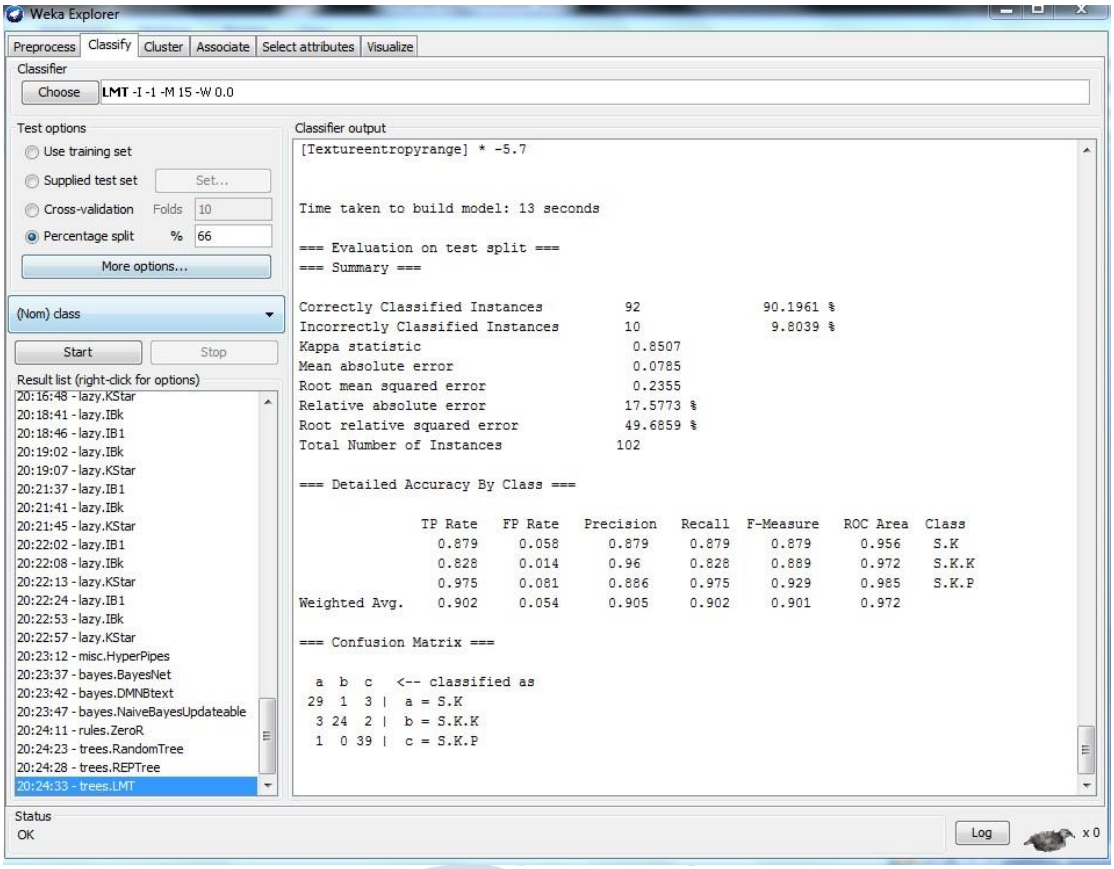

Fig 3.6 B11 ANN classification results

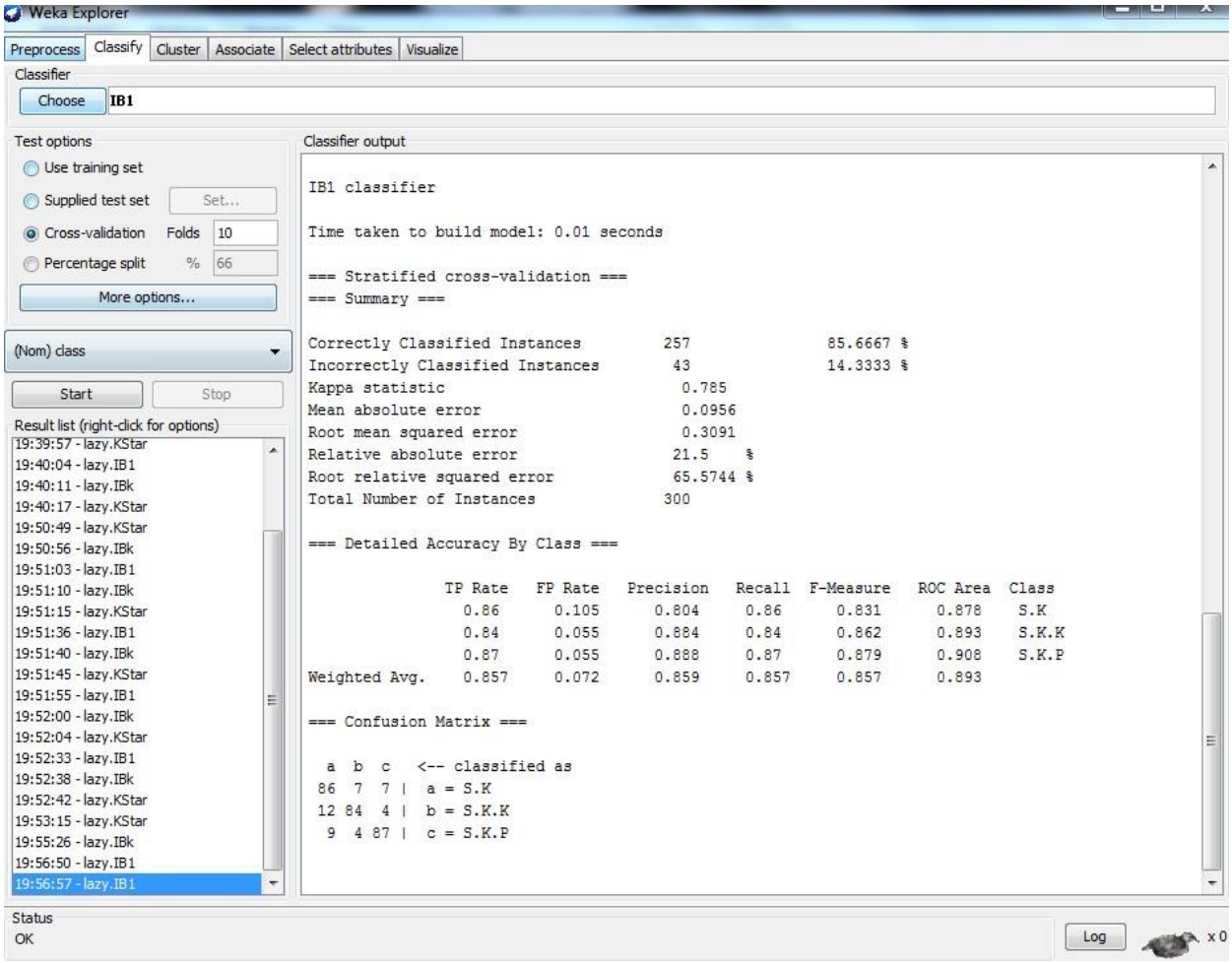

Fig 3.7 B11 Neural Network settings

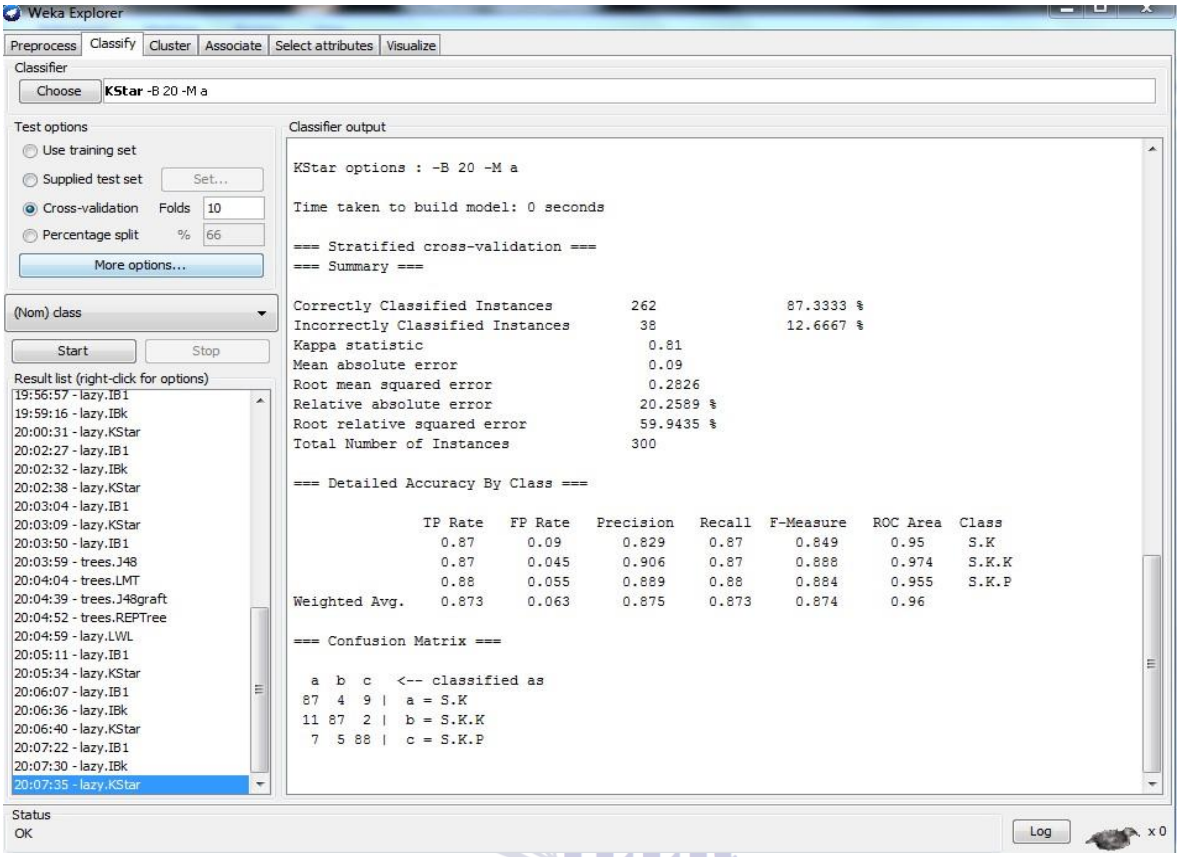

Fig 3.8 B11 PCA classification results

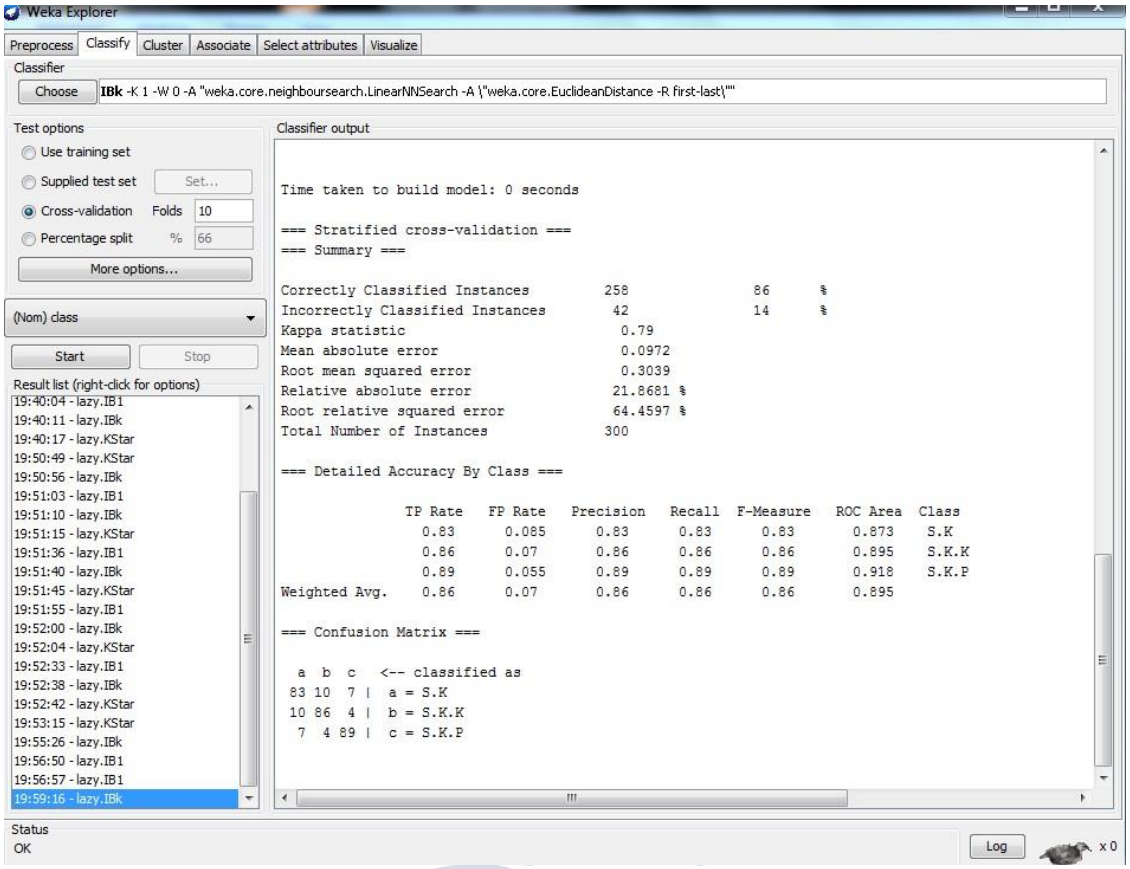

Fig 3.9B11 LDA classification results

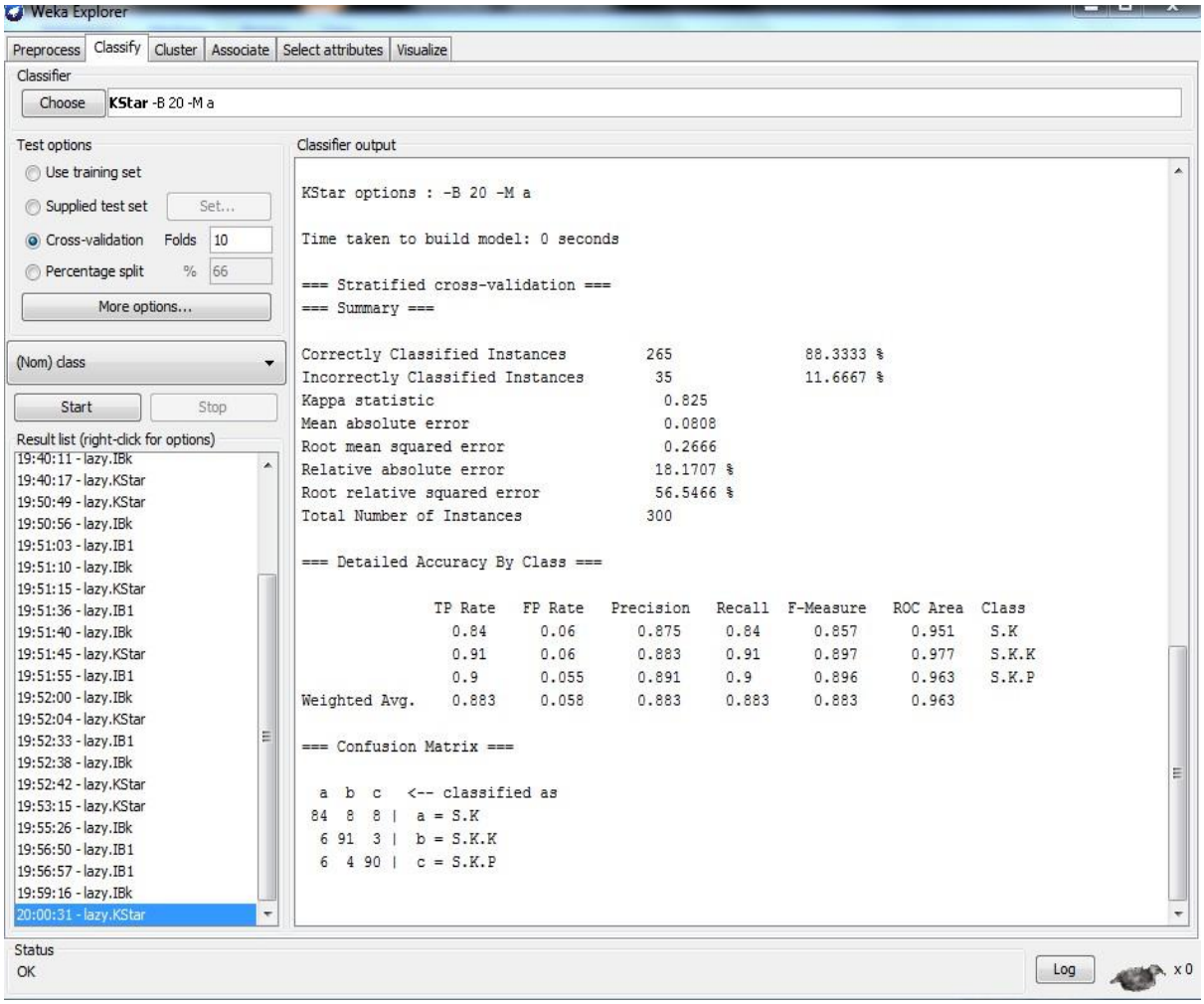

Fig 3.10B11 PCA classification results

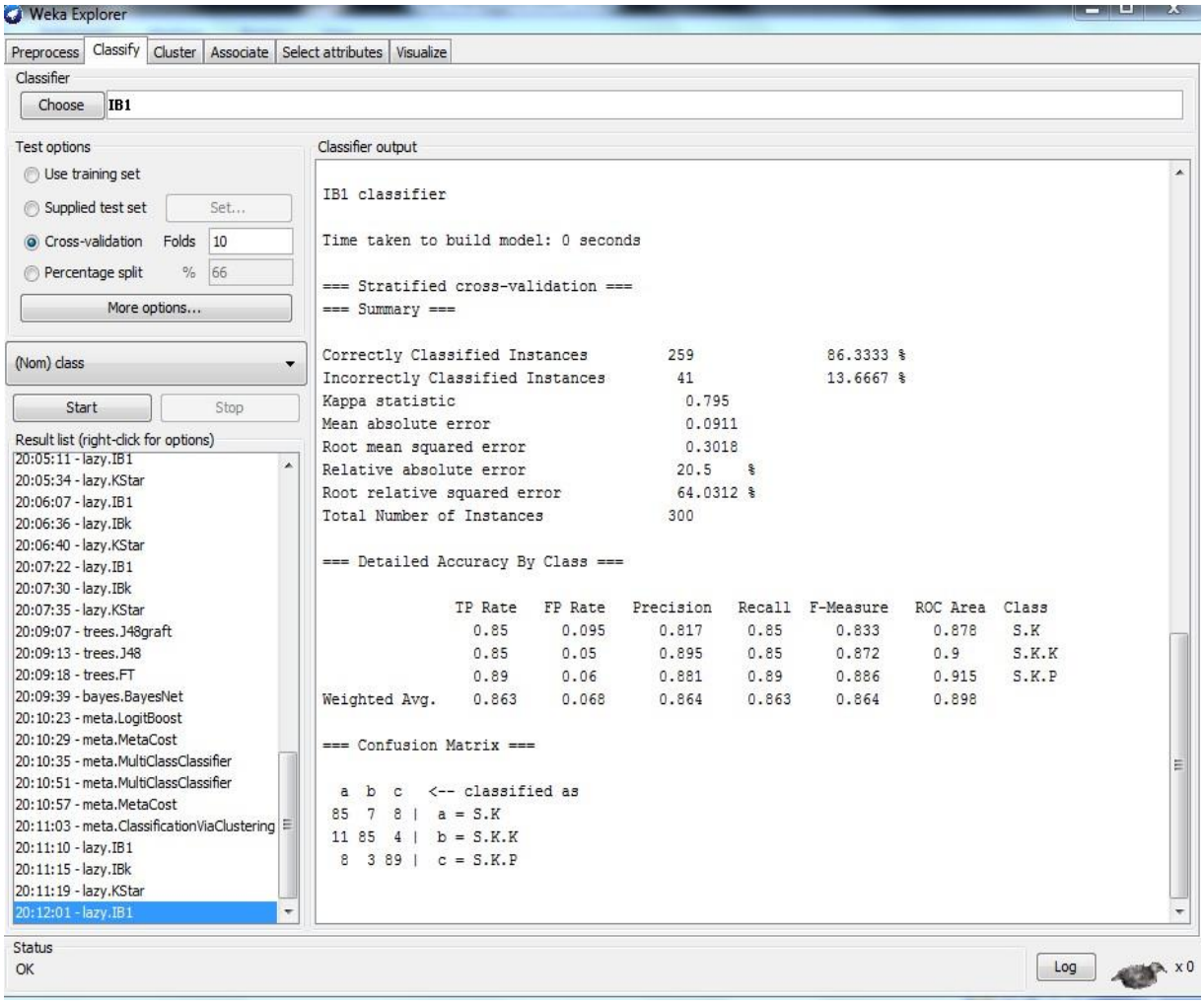

Fig 3.11B11 LDA classification results

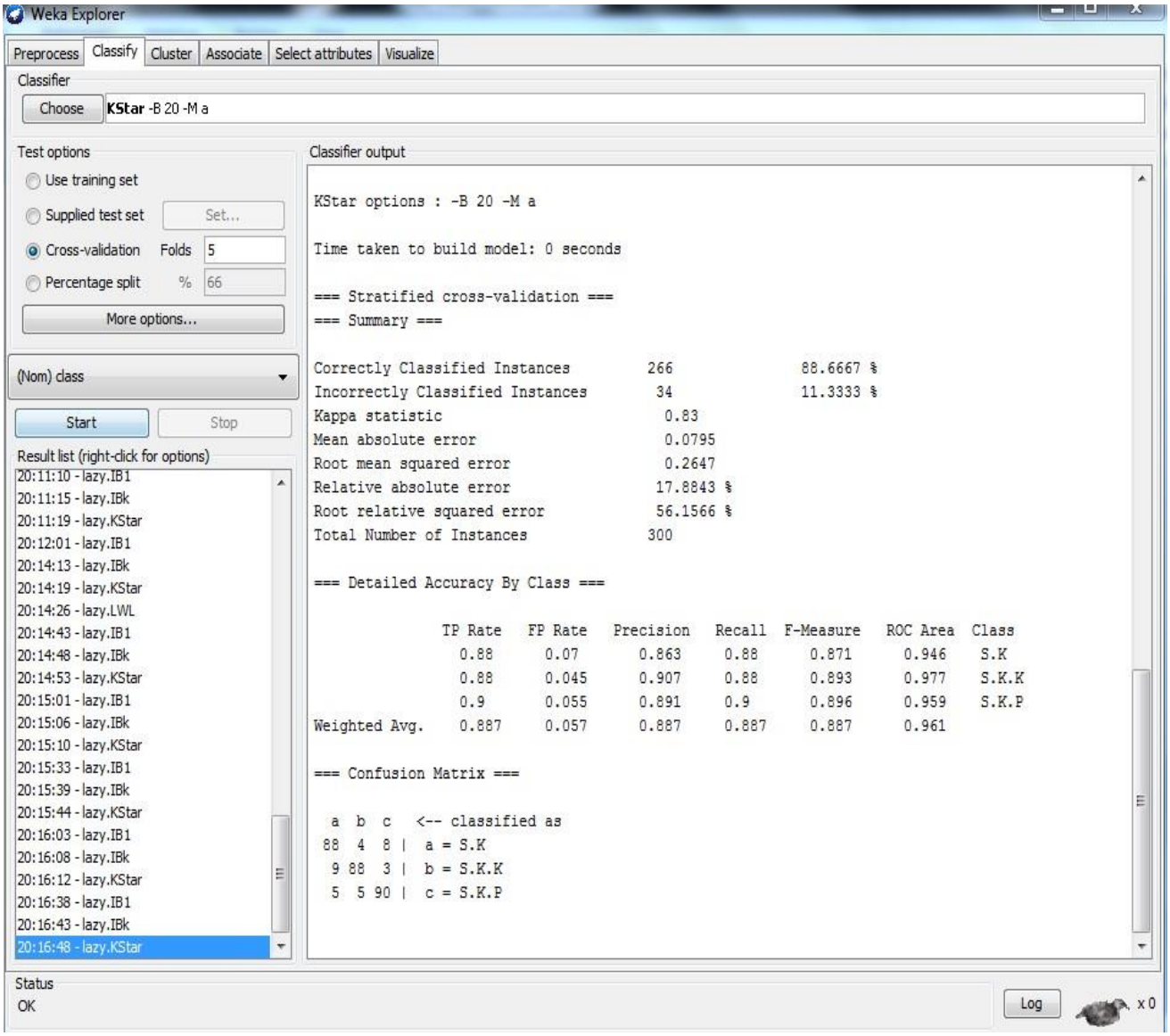

Fig 3.12 B11 ANN classification results

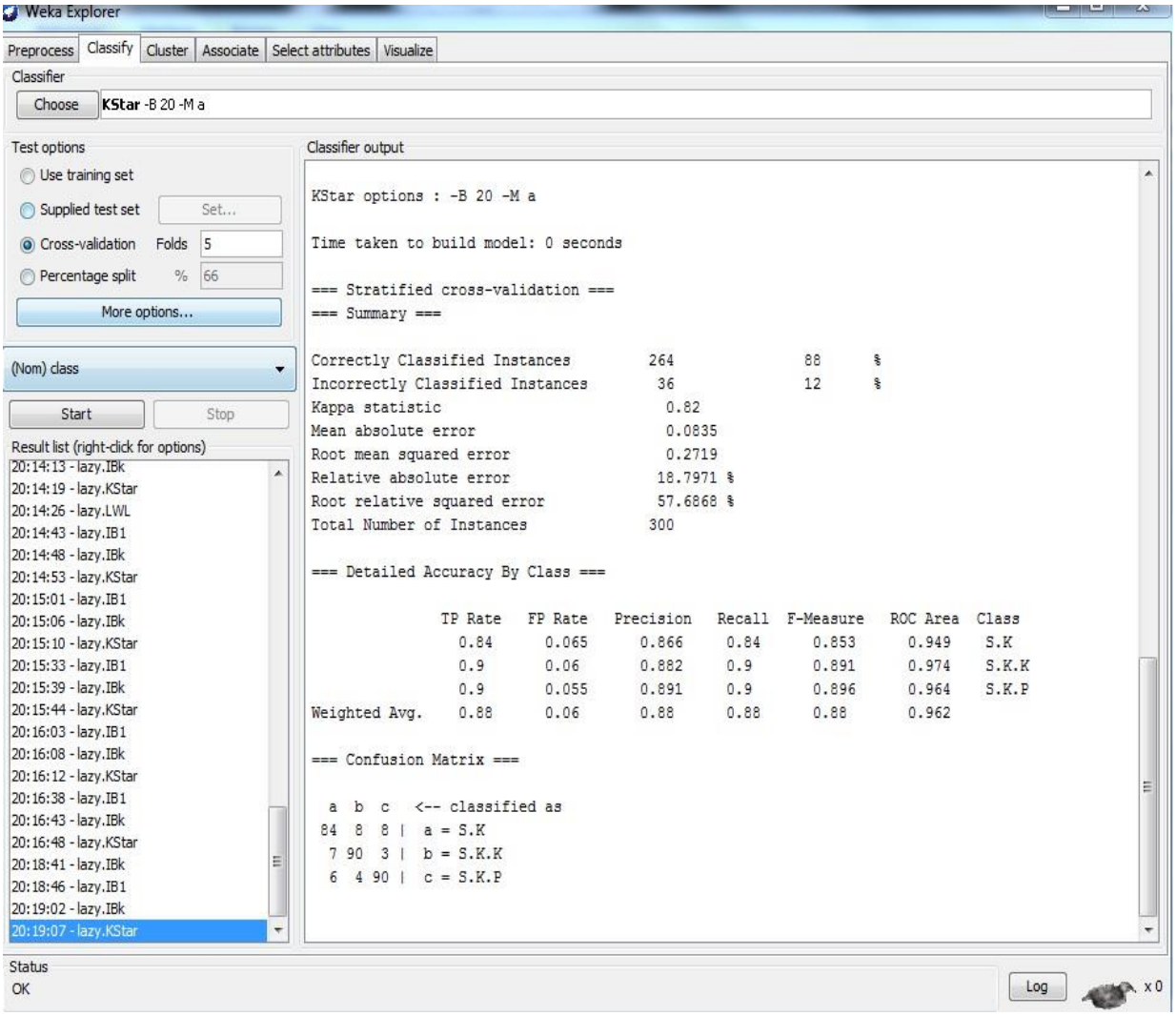

Fig 3.13 B11 PCA classification results with 64x64

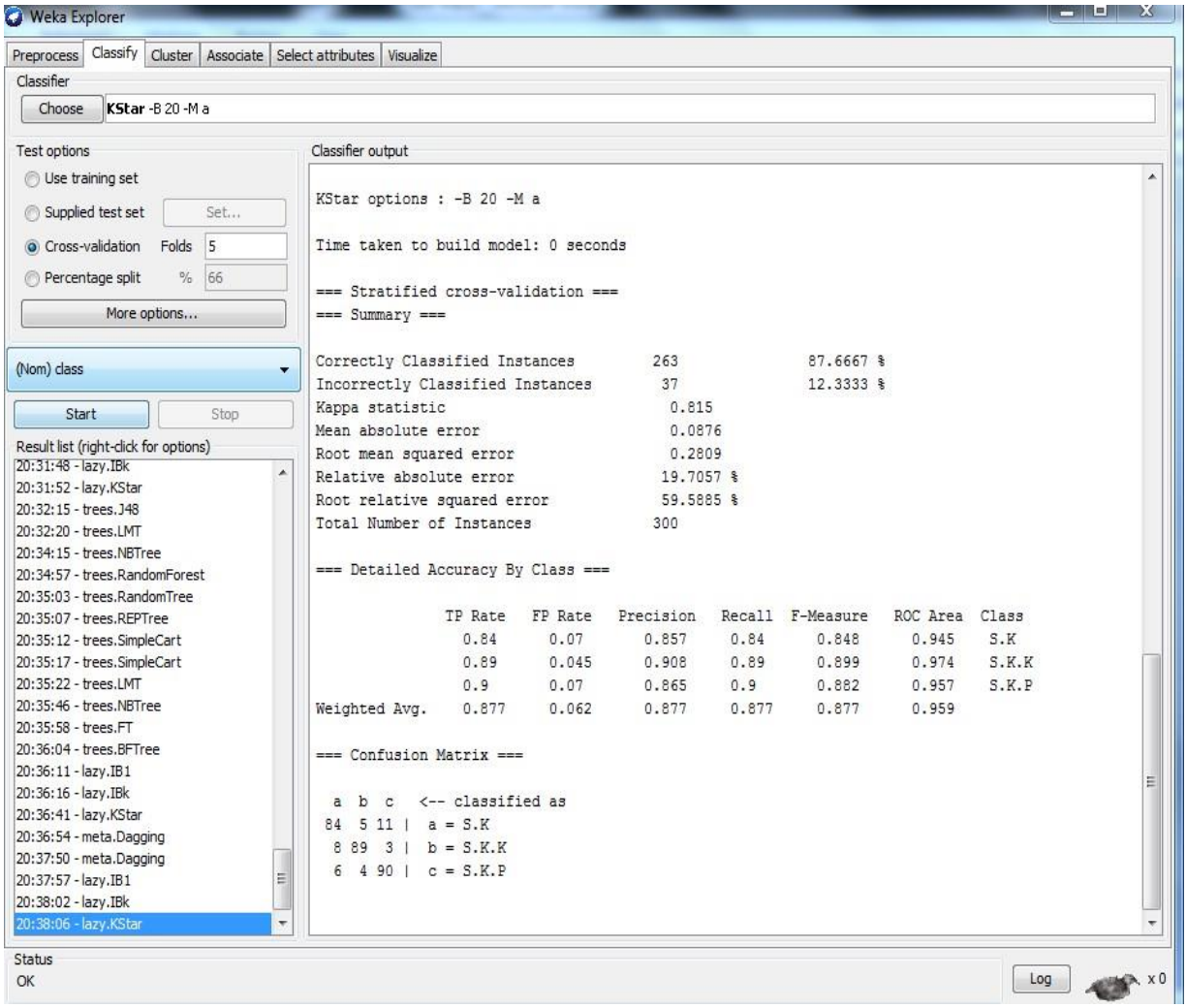

Fig 3.14B11LDA classification results with 64x64

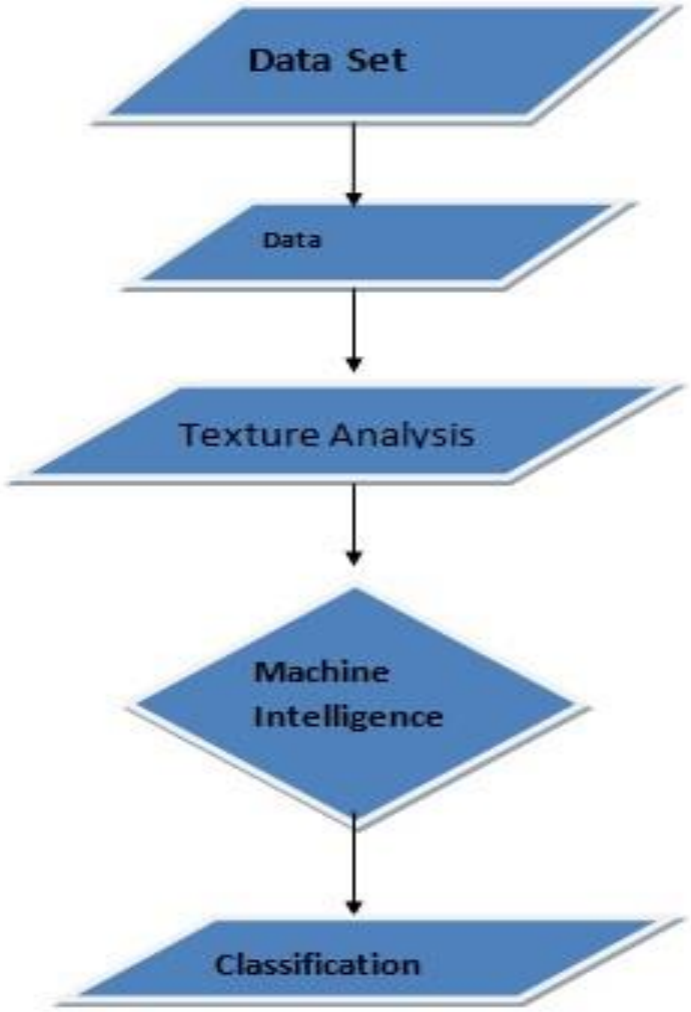

Fig 3.15 Frame work of rice classification

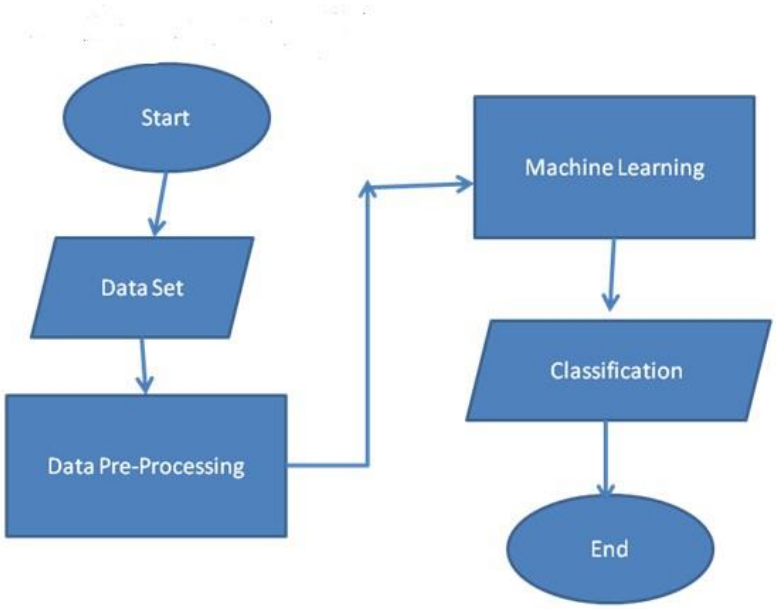

Fig. 3.16 Steps involve in rice classification

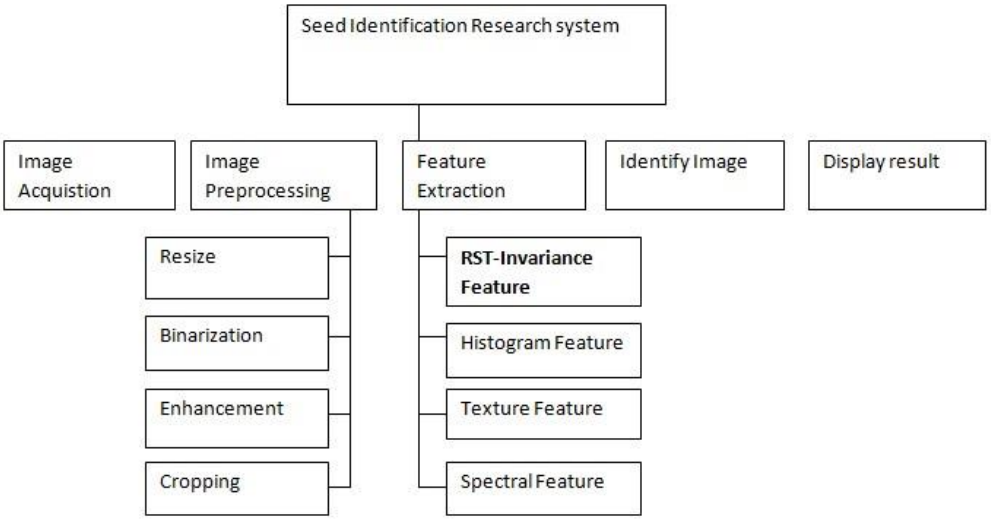

Fig 3.17 Detailed stages of rice classification

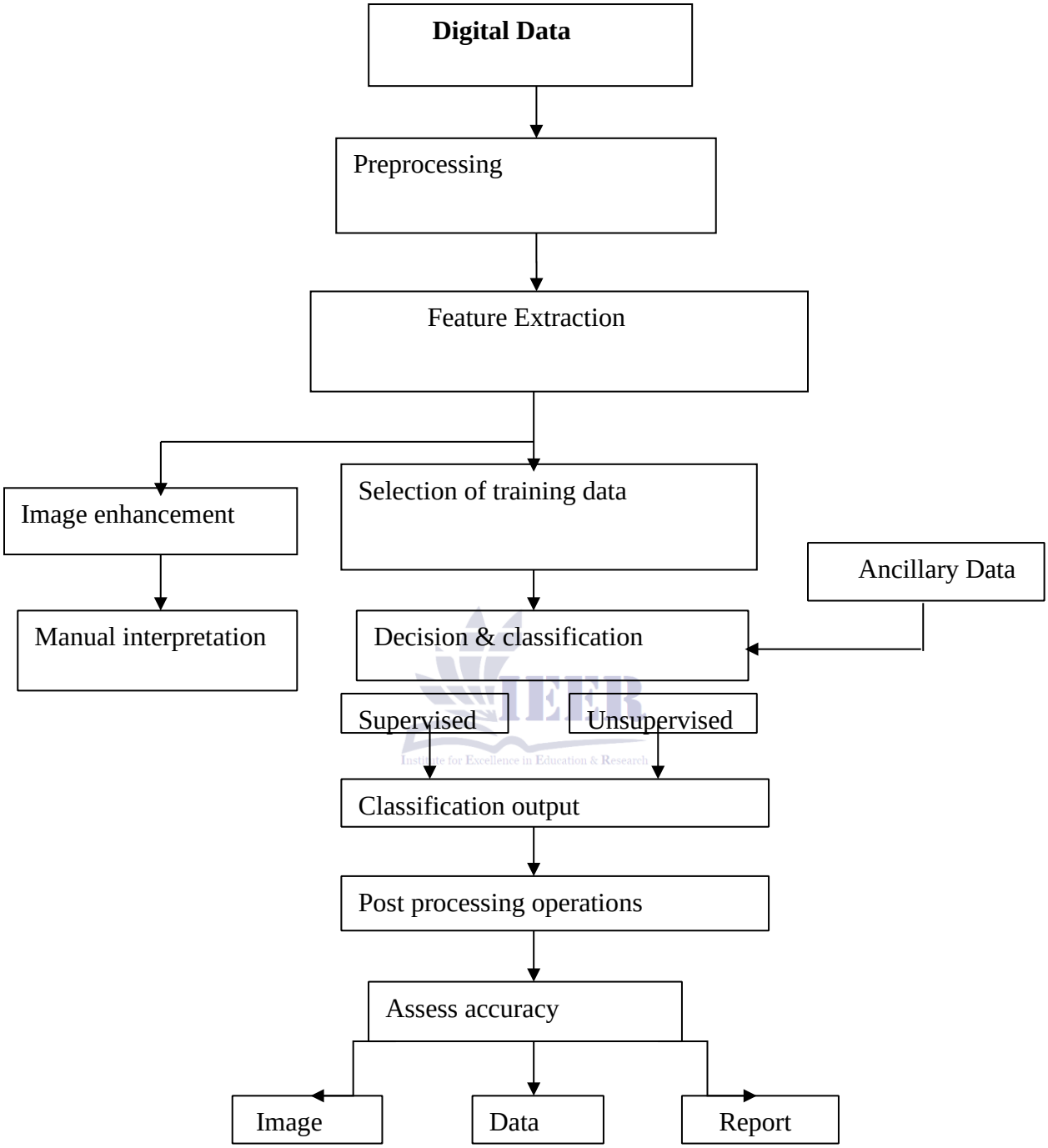

Fig. 3.18 System structure.

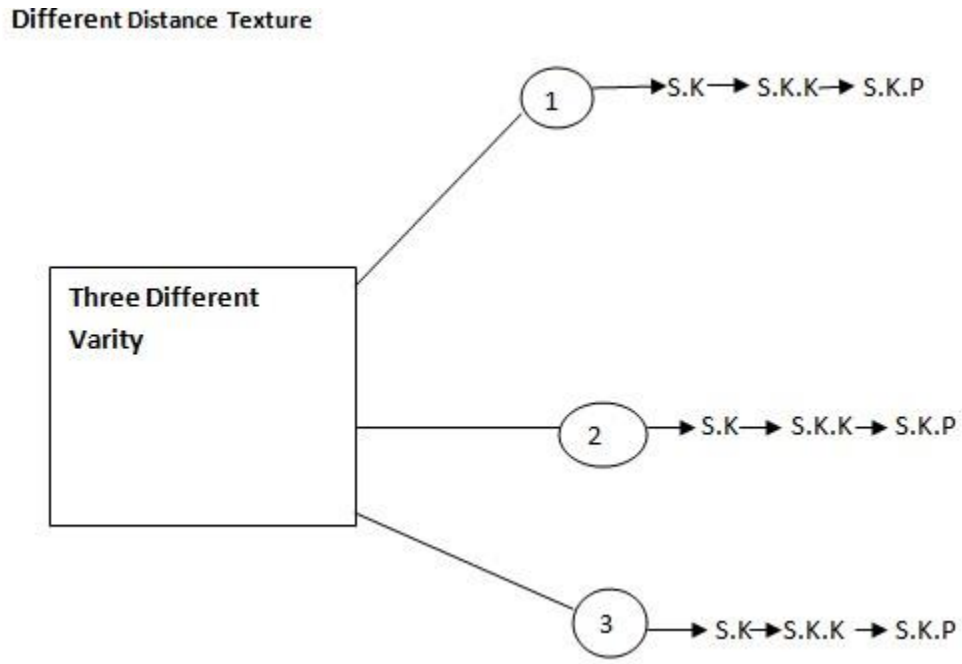

Fig 3.19 Texture

3.25 Image Pre-processing.

The aim of pre-processing is an improvement of image data that suppresses unwanted enhances some image features for further processing. The image pre-processing methods consists of three steps.

1. IMAGE RESIZE.
2. IMAGE BINARIZATION.
3. IMAGE ENHANCEMENT.

1. **Image resize**

The capture images of different sizes which can affect the results. Then the resize every image to convert 512 pixels in height and width the area of ratio will maintain consistency and reduce preprocessing the time.

2. **Image binarization.**

In cvip tool changes in RGB color image to a gray- scale image . So this method is simply used to perform RGB color image.

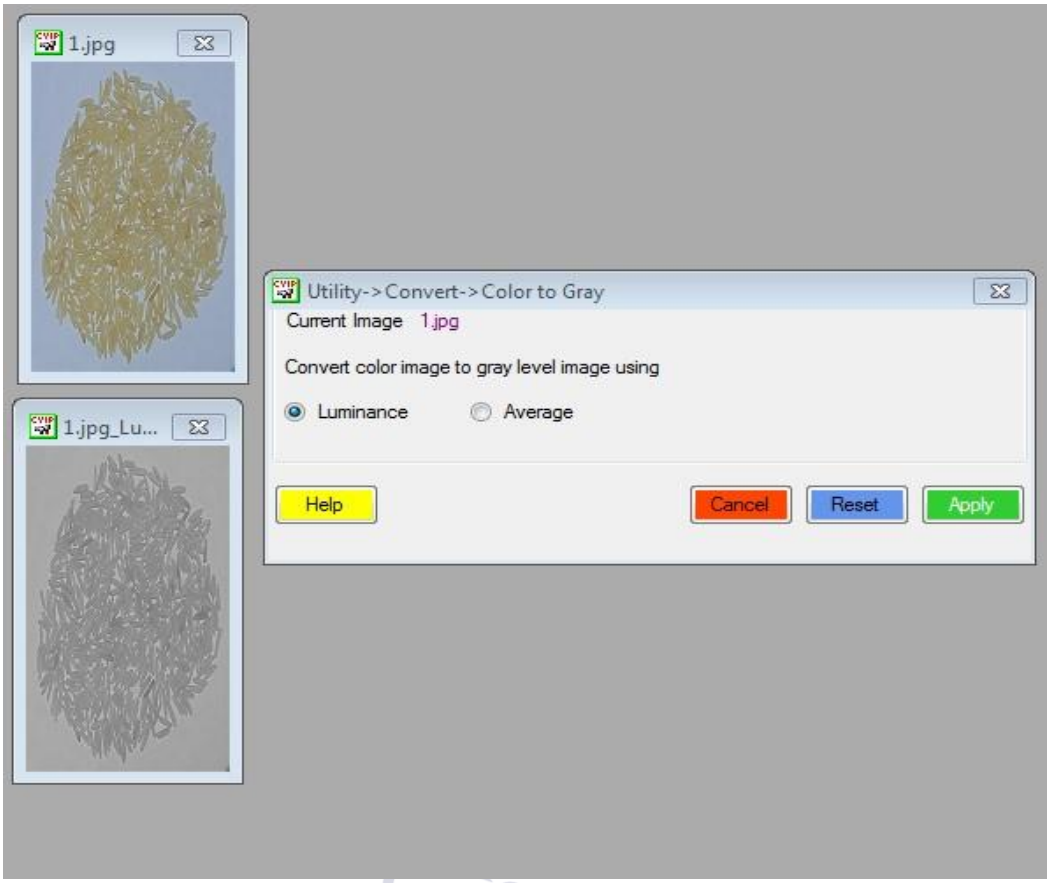

Fig 3.20 ROI selection in CVIP tool

3. Image enhancement

Image improvement is a course of adjust the digital image. The outcomes are more suitable for displaying or further image psychotherapy. You can remove noise, or brightness an image and making it easier to discover key features. The reason is an image enhancement is to improve the interoperability or perception of information images for viewers.

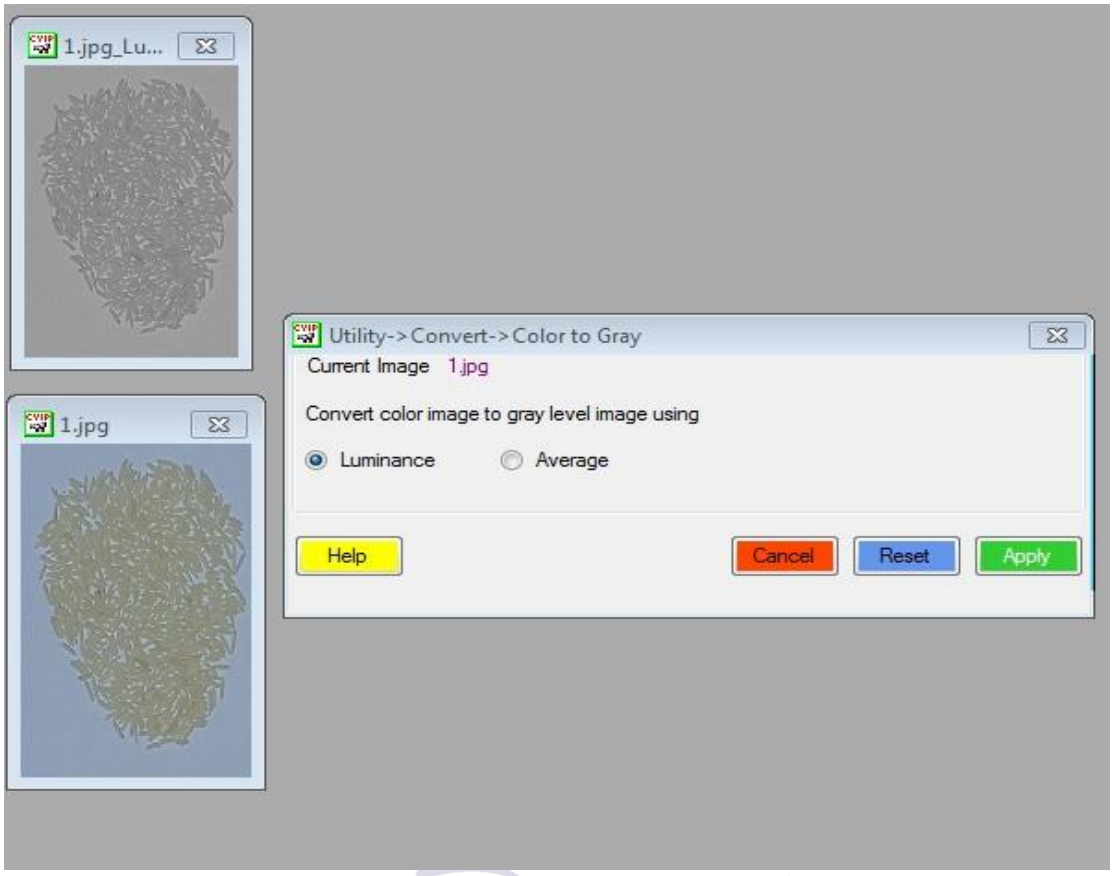

Fig 3.20Color conversion in CVIP tool

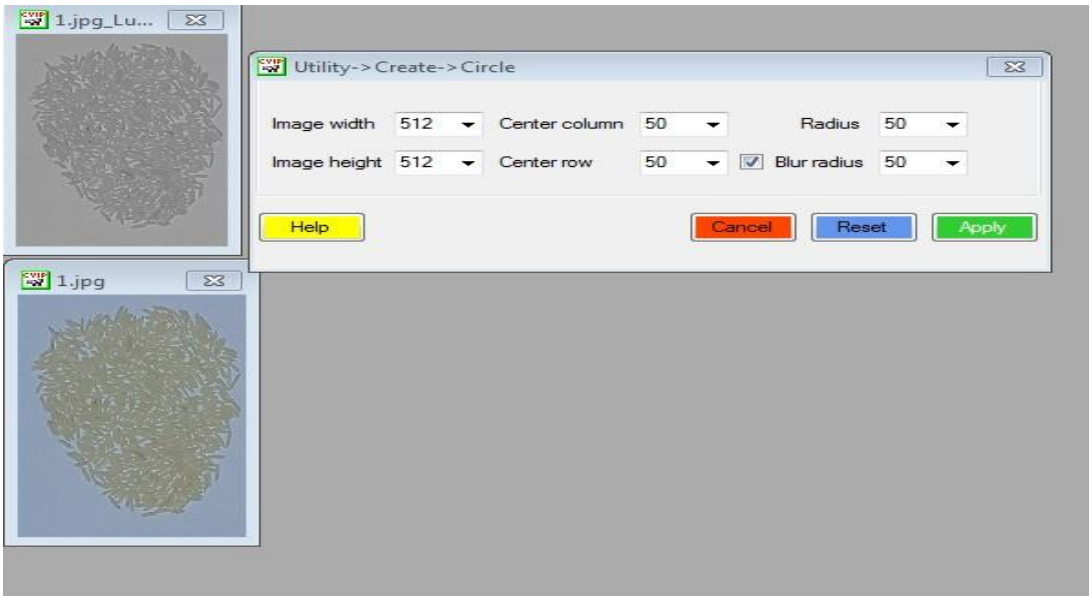

Fig 3.21 ROI size selection window in CVIP tool

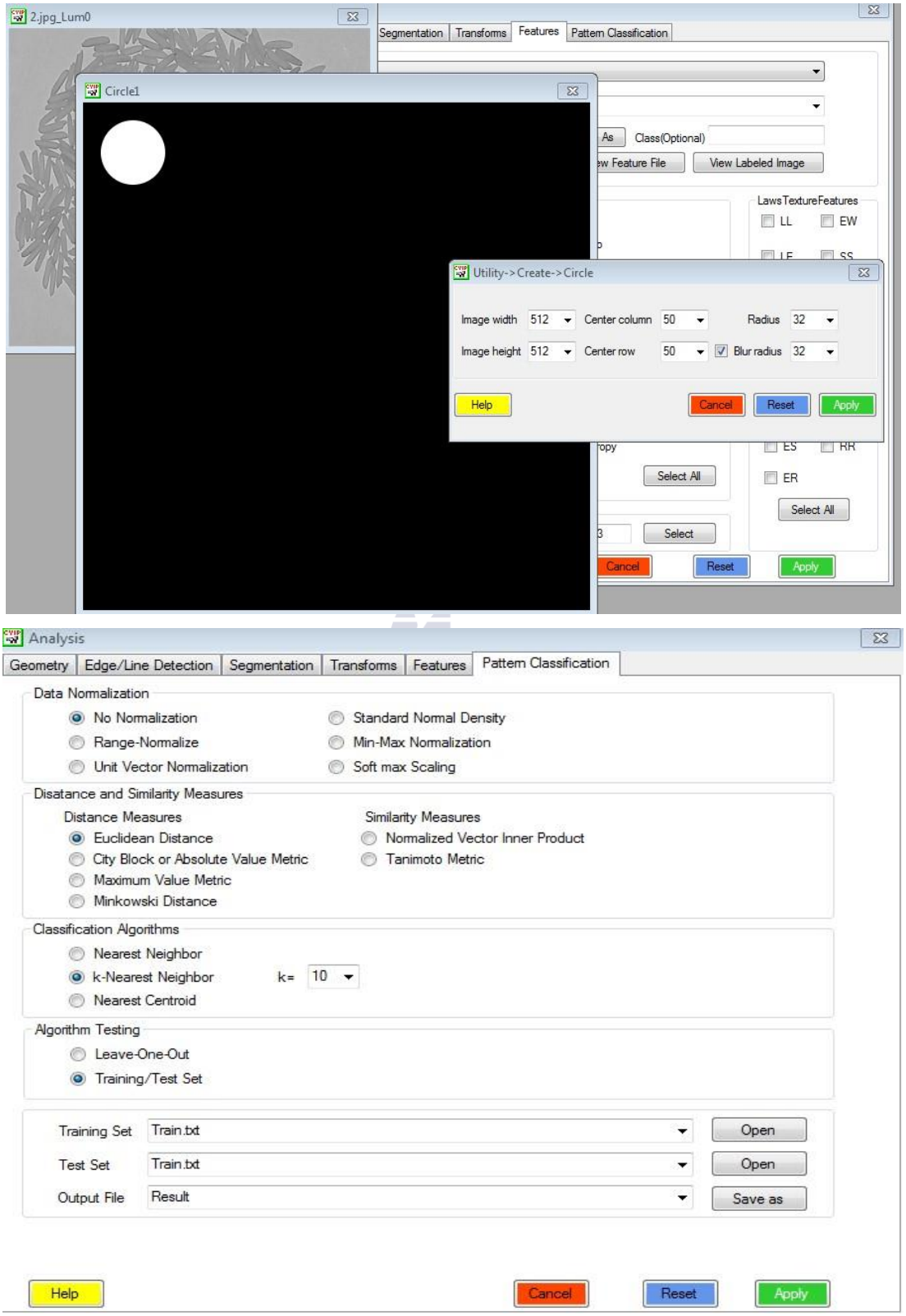

Fig 3.22 Features selection in CVIP tool

3.26 Feature selection in cvip tools

In cvip tools we can draw out binary functions, RST invariance rst 1 to 7 rst functions, Histogram functions, Texture distance, Texture features, Spectral features and Histogram mean function, entropy, inertia, connection, inverse difference and entropy with texture range 1 to 6. ANS spectral functions with different variety of simply clicking and then select the feature extraction.

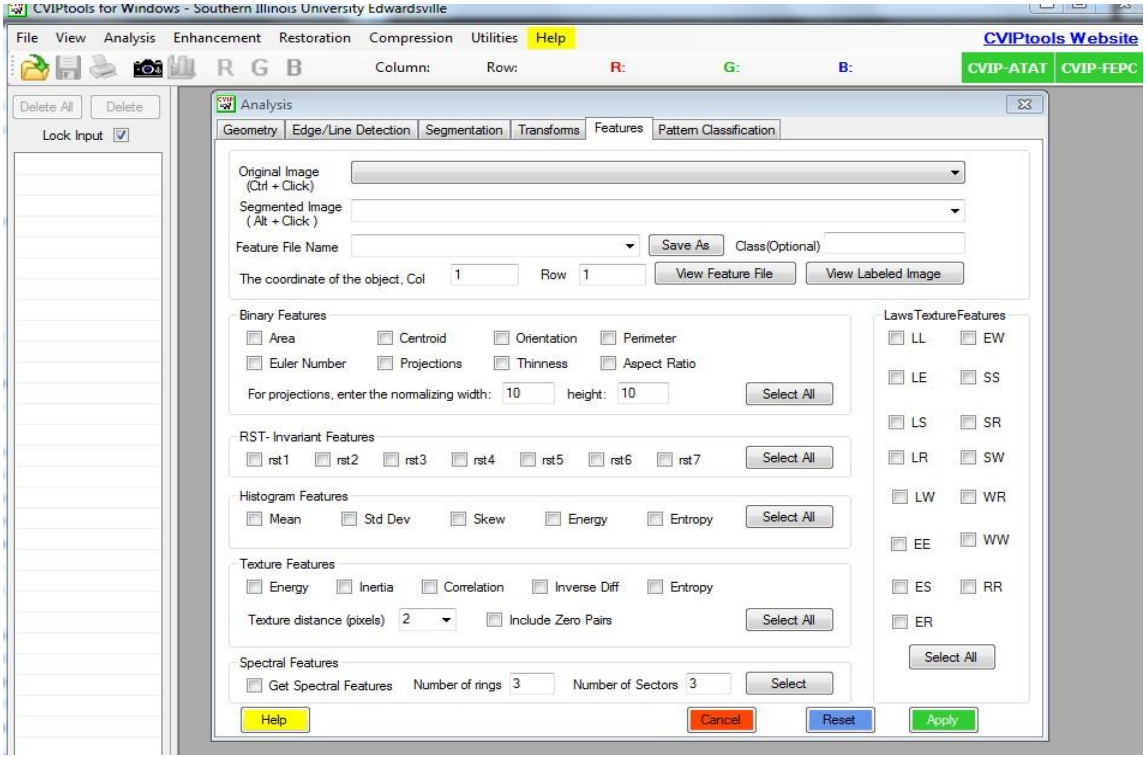

Fig 3.23 Histogram features selection in CVIP tool

3.26.1 Texture classification

It can be separated in to two main levels, structure research and classification. During structure research the structure material of the pictures is taken with a structure research method, which result in a set of textural functions for each picture. These functions are then used with a category criteria to categorize new structure examples and properly related them with known class. Image segmentation The after that procedure during image dispensation be there presentation segmentation and the Very primary stair in image examination is image segmentation. Image sample.

Sample image of Superkernal for features extracted from grain is shown below.

Fig 3.24 Three types of rice

In this research we have to use image processing technique an attempts to automate the process which overcome the draw backs of manual process. Here we use the different varieties of rice grains for testing. We use image processing tool box of MATLAB for grading of rice grains. We can design a low cost dector which helps in extracting the morphological skin of grain like area, parameter and distance end to end etc.

3.26.2 Machine vision

Machine visualization is individual of the important higher technical meadow anywhere Important growth have been complete. Machine vision attempt to get of sensory insight of human being via, idea, feel, odor, flavor, inquiry etc. Hard work employment is organism made towards the substitute of conventional human sensory section With automatic system Scientist have productively talented computers with machine vision by digital cameras and machines. Extreme research is a development all over the country on request of electronic eyed ease.

Examples.

- Optical character recognition.

classify image of handwritten font through the writing represent.

- Face detection.

Discover face in images (or else specify if an expression is current).

- Spam filtering**.**

Recognize memo messages as spam or non spam.

- Fraud detection.

Recognize praise card contact (intended for instance) which may perhaps be fake in character.

- Weather prediction.

Forecast, designed for example, whether or not it determination drizzle tomorrow Image processing. Image processing is a technique in the direction of change and reflection in to digital shape as well as execute a few operation on it, in organize to obtain an improved image or to take out some practical in sequence from it.It is a type of signal dispensation in which input is image, like video frame or photograph and output may be image or individuality connected with that image. Frequently image dispensationorganizationinclude treat descriptions because two dimension signalthoughapplyby now set signal processing methods to them. Image processing fundamentally include the subsequent three stepladders.

1. **Importing**

Import is the image with optical scanner or by cinematography.

2. **Analyzing**

Analyzing as well asmanipulate the image which includeinformationdensity and image development and spotpatterntobe not towardbeinglookatsimilar to satellite photograph.

3. Output

Output is the final stage in which productis able toward be distorted image or report that based happening image investigation.

Types of image processing.

There are two types of image processing.

1. Analogue.
2. Digital

1. **Analogue:** It can exist use for the solid copy similar to print out as well as photograph.
2. **Digital** : Technique facilitate during operation of the digital image through by means of computer. When rare facts as of image sensors as of dependency plate form contain deficiencies. Some phases of image processing are Pre-processing, improvement and display, Information taking out. The digital images were proposed and morphological features were extracted from an individual grain. The grain features extracted were length, width, area, perimeter and compactness ratio. Supervised classification.

3.27 Supervised classification:

Is base on the idea to a consumer be able to choose test Pixels within an image with the purpose of be delegate of precise program as well as after that directly the image processing software toward apply these preparation site because reference used for the categorization of every one further pixels in the image. Preparation site (as well recognized because difficult set otherwise contribution program) are select base on top of the Knowledge of the user. The user also set the boundaries for

how a like further pixels have to be to group them jointly. These boundaries are regularly set base on the shadow like uniqueness of the training region, benefit or lesser amount a sure increase (often base on "intensity" or force of reflection in exact spectral band). The user also designate the number of lessons that the Image is classify into. Many analyst use a mixture of supervise as well as unsupervised categorization process in the direction of build up absolute production examination as well as categorize maps.

3.28 Unsupervised classification

Unsupervised classification be wherever the outcome (group of pixels by frequent uniqueness) are base going on the software examination of an image with no the consumer as long as test program. The computer use technique in the direction of conclude which pixels be connected and group them into program. The user be able to state which algorithm the software determination utilize and the preferred digit of output classes but otherwise does not help inside the categorization procedure. Though, the user have to contain information of the area being confidential while the grouping of pixels by frequent individuality shaped by the computer have to related to actual features on top of the land (such as swampland, urban areas, coniferous forest, etc.).

Chapter 4 Results & Discussions:

4.1 Tables Classifier:

This table shows that difference performance evaluating parameters that are TP, FP Rate, Precision, Recall, F-Measure, Roc Area, Class

TP Rate: It Is also call the true optimistic speed, the remind or probability of recognition in Some field procedures the proposition of positive to be correctly identified as such as, the entitlement of under parnatives who are appropriately identified as have the conditions.

Roc Area: It is a false positive rate although alternatives have been recommended and ploting sensitivity vs specify is equivalent. Not that recall=tpr=sensitivity and fpr=1- specify and that tpr and fpr and provided by weka. **FP Rate:** When a performing multiple comparisons in a statistical such as above, the false positive ratio(also known as the false alarm ratio).

Recall: The action or faculty of remembering something learned or experienced.

F-measure: It is a determine of a tests correctness and be distinct as the biased choral Mean of the accuracy and remind of experiment. **Class:** The classes of this research are s. k, s. k. k, s. k. p

Different rice varities, these varities of rice s. k, s. k. k, s. k.pand the weighted average, the accuracy of these varities are shown in table. Confusion matrix are shown diagonal matrix classified as. These parameters show the performance of implement classifier. This table of diagonal matrix are**29,24,39**.

Detailed Accuracy By Class ===

TP Rate	FP Rate	precision	Recall	F-Measure	ROC Area	Class
0.879	0.058	0.879	0.879	0.879	0.973	S.K
0.828	0.041	0.889	0.828	0.857	0.978	S.K.K
0.975	0.048	0.929	0.975	0.951	0.991	S.K.P
0.902	0.049	0.901	0.902	0.901	0.981	Weighted Avg

=== Confusion Matrix ===

A	B	C	<-- Classified as
29	2	2	a= S.K
4	**24**	1	b = S.K.K
0	1	**39**	c = S.K.P

Table 4.1Accuracy results and confusion matrix

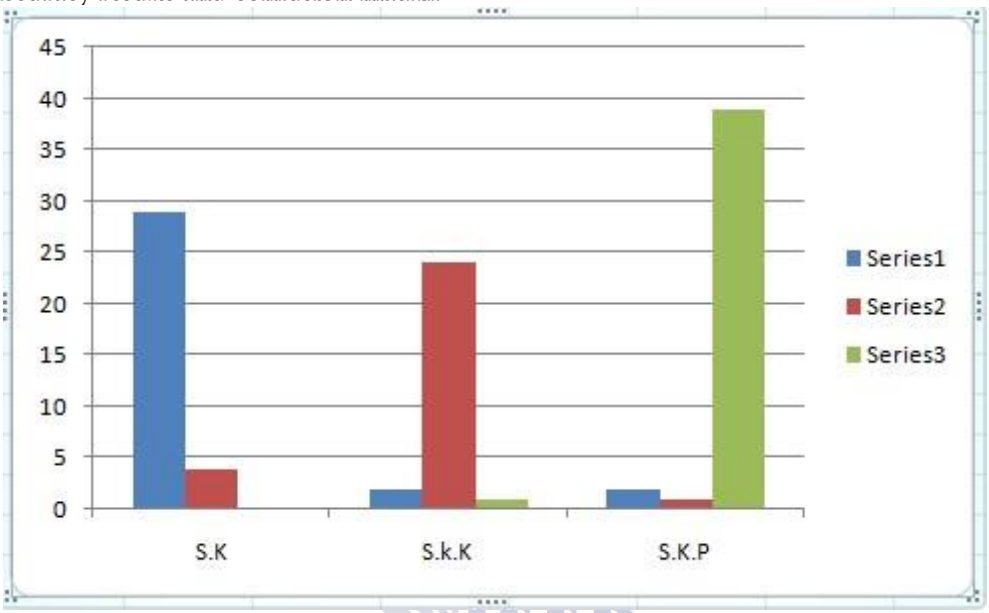

Fig 4.1 : 90.1% Lazy.k star-B-20-Ma

The graph shows the Red, Green, and Blue it shows the performance of series 1, series 2 and series 3. The s.k shows the graph near about the 30 and s.k.k red graph shows the class near about 25 and last green graph shows the class s.k.p is near about 40. This graph shows 90.1% accuracy result and this classifier are Lazy. K star-B-20-Ma.

Different rice varities, these varities of rice s.k, s.k.k, s,k.p and the weighted average, the accuracy of these varities are shown in table. Confusion matrix are shown diagonal matrix classified as. These parameters show the performance of implement classifier. This table of diagonal matrix are **29,24,39.**

Table 4.2Accuracy results and confusion matrix

=== Detailed Accuracy by Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.879	0.058	0.879	0.879	0.879	0.956	S.K
0.828	0.014	0.96	0.828	0.889	0.972	S.K.K
0.975	0.048	0.929	0.975	0.929	0.985	S.K.P
0.902	0.054	0.905	0.902	0.901	0.972	Weighted Avg

=== Confusion Matrix ===

a	b	c	<-- Classified as
29	1	3	a = S.K
3	**24**	2	b = S.K.K
1	0	**39**	c = S.K.P

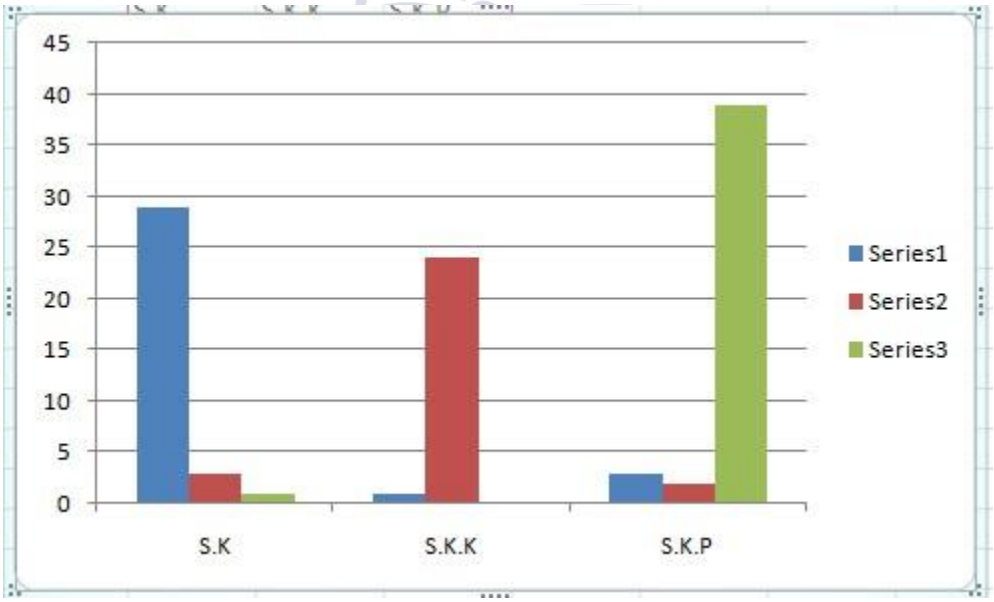

Fig 4.2 : 90.1% .LMT –l-1-W 0.0

The graph shows the Red, Green, and Blue it shows the performance of series 1, series 2 and series 3. The s.k shows the graph near about the 30 and s.k.k red graph shows the class near about 25 and last green graph shows the class s.k.p is near about 40. This graph shows 90.1% accuracy result and this classifier are LMT -l

-1 -M 15 -W 0.0 Different rice varities, these varities of rice s.k, s.k.k, s,k. p and the weighted average, the accuracy of these varities are shown in table. Confusion matrix are shown diagonal matrix classified as. These parameters show the performance of implement classifier. This table of diagonal matrix are **27,24,39.**

=== Detailed Accuracy by Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.818	0.029	0.931	0.818	0.871	0.915	S.K
0.828	0.068	0.828	0.828	0.828	0.91	S.K.K
0.975	0.081	0.886	0.975	0.929	0.976	S.K.P
0.882	0.06	0.884	0.882	0.881	0.938	Weighted Avg

=== Confusion Matrix===

a	B	C	<-- classified as
27	4	2	a = S.K
2	**24**	3	b = S.K.K
0	1	**39**	c = S.K.P

Table 4.3 Accuracy results and confusion matrix

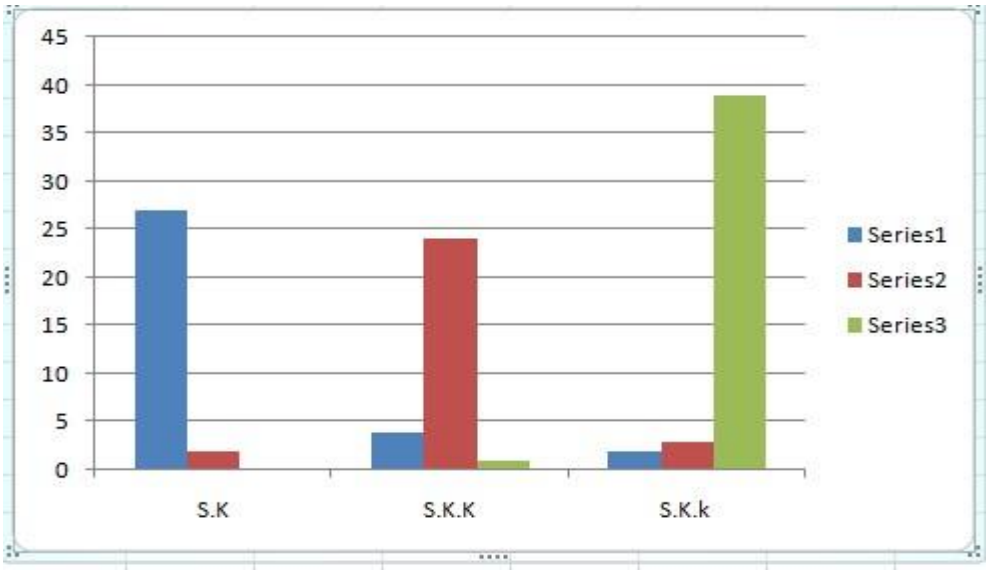

Fig 4.3 :88.23% Trees. J 48graft

The graph shows the Red, Green, and Blue it shows the performance of series 1, series 2 and series 3. The s.k shows the graph near about the 25 and s.k.k red graph shows the class near about 25 and last green graph shows the class s.k.p is near about 40. This graph shows
90.1%
accuracy result and this classifier are trees. J 48graft Different rice varities, these varities of rice s.k, s.k. k, s. k. p and the weighted average, the accuracy of these varities are shown in table. Confusion matrix are shown diagonal matrix classified as. These parameters show the performance of implement classifier. This table of diagonal matrix are **27,23,39.**

Table 4.4 Accuracy results and confusion matrix

=== Detailed Accuracy by Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.818	0.014	0.964	0.818	0.885	0.973	S.K
0.793	0.068	0.821	0.793	0.807	0.935	S.K.K
0.975	0.113	0.848	0.975	0.907	0.981	S.K.P
0.873	0.068	0.878	0.873	0.872	0.965	weighted Avg

=== Confusion Matrix ===

a	b	C	<-- classified as
27	4	2	a = S.K
1	**23**	5	b = S.K.K
0	1	**39**	c = S.K.P

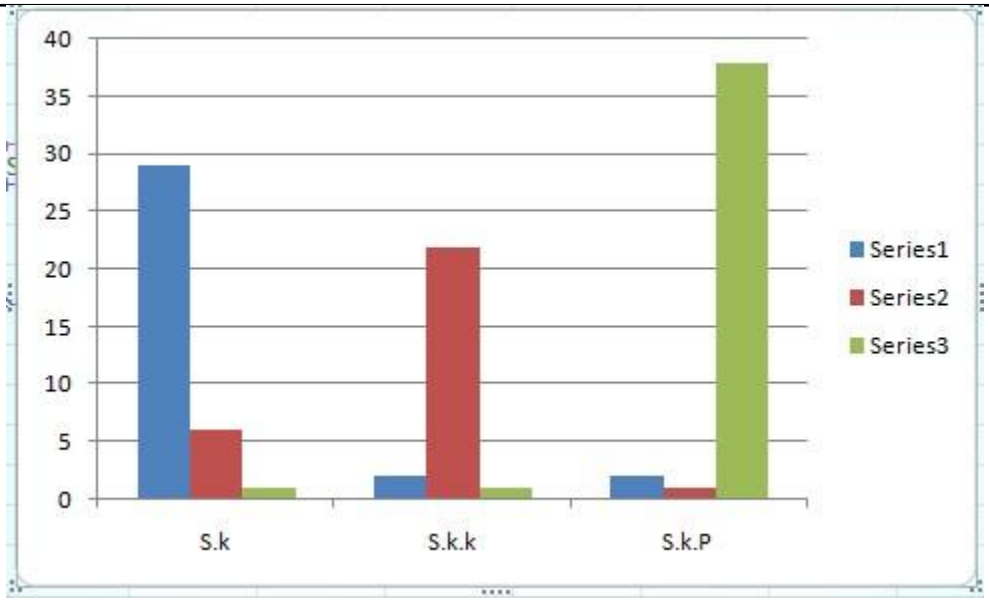

Fig 4.4: 87.2% MetaRandom.Subspace

The graph shows the Red, Green, and Blue it shows the performance of series 1, series 2 andseries 3. The s.k shows the graph more about then 25 and near about30, and s.k.k red graph shows the class near about 20 and last green graph shows the class s.k.p is near about 40. This graph shows 87.1% accuracy result and this classifier are trees. J 48graft Different rice varities, these varities of rice s. k, s. k. k, s. k.p and the weighted average, the Accuracy of these varities are shown in table. Confusion matrix are shown diagonal matrix classified as. These parameters show the performance of implement classifier. This table of diagonal matrix are **26,24,39.**

Table 4.5Accuracy results and confusion matrix

=== Detailed Accuracy by Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.788	0.043	0.897	0.788	0.839	0.972	S.K
0.828	0.068	0.828	0.828	0.828	0.949	S.K.K
0.975	0.081	0.886	0.975	0.929	0.983	S.K.P
0.873	0.065	0.873	0.873	0.871	0.97	Weighted Avg

=== Confusion Matrix ===

a	B	c	<-- classified as
26	5	2	a = S.K
2	**24**	3	b = S.K.K
1	0	**39**	c = S.K.P

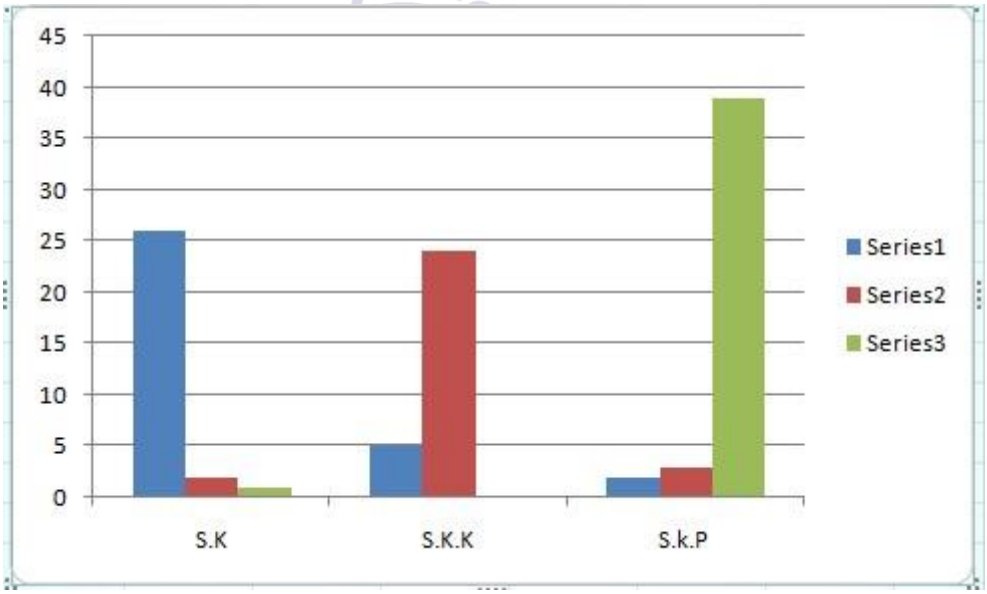

Fig 4.5 : 87.2 % Meta.Bagining

The graph shows the Red, Green, and Blue it shows the performance of series 1, series 2 and series 3. The s.k shows the graph near about 25 and near about40, and s.k.k red graph shows the class near about 20 and last green graph shows the class

s.k.p is near about 40. This graph shows 87.1% accuracy result and this classifier are 87.2 % Meta.BaginingDifferent rice varities, these varities of rice s.k, s.k .k, s. k.p and the weighted average, the accuracy of these varities are shown in table. Confusion matrix are shown diagonal matrix classified as. These parameters show the performance of implement classifier. This table of diagonal matrix are **29,22,38.**

Table 4.6Accuracy results and confusion matrix

=== Detailed Accuracy by Class===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.879	0.101	0.806	0.879	0.841	0.889	S.K
0.759	0.041	0.88	0.759	0.815	0.859	S.K.K
0.95	0.048	0.927	0.95	0.938	0.951	S.K.P
0.873	0.063	0.874	0.873	0.872	0.905	Weighted Avg

=== Confusion Matrix===

a	b	c	<-- classified as
29	2	2	a = S.K
6	**22**	1	b = S.K.K
1	1	**38**	c = S.K.P

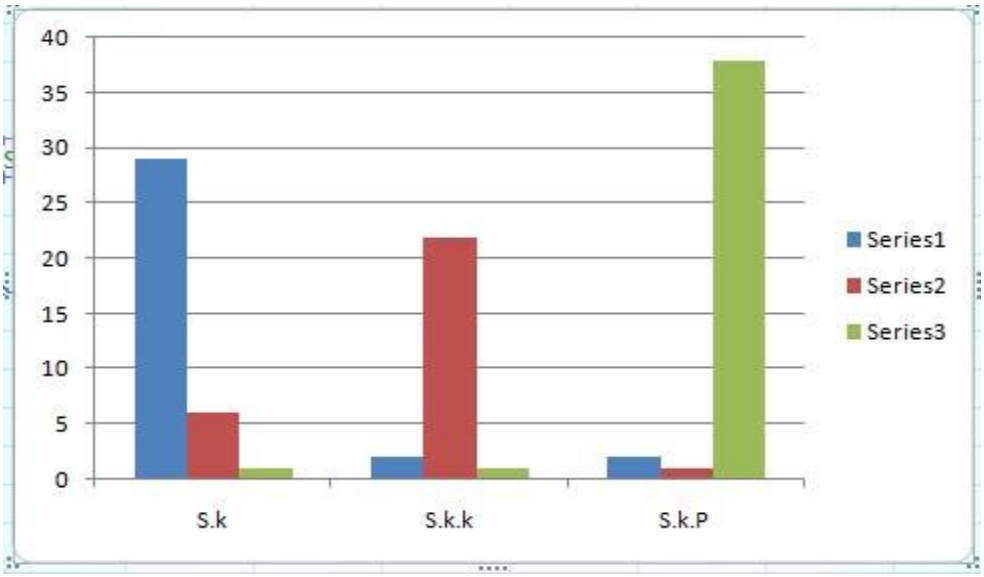

Fig 4.6: 87.2% Lazy.IBK

The graph shows the Red, Green, and Blue it shows the performance of series 1, series 2 and series 3. The s.k shows the graph near about 25 and near about40, and s.k.k red graph shows the class near about 20 and last green graph shows the class
s.k.p is near about 40. This graph shows 87.1% accuracy result and this classifier are 87.2% Lazy.IBKDifferent rice varities, these varities of rice s. k, s. k. k, s. k.p and the weighted average, the accuracy of these varities are shown in table. Confusion matrix are shown diagonal matrix classified as. These parameters show the performance of implement classifier. This table of diagonal matrix are **29,22,37.**

Table 4.7Accuracy results and confusion matrix

=== Detailed Accuracy by Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.879	0.101	0.806	0.879	0.841	0.964	S.K
0.759	0.068	0.815	0.759	0.786	0.946	S.K.K
0.925	0.032	0.949	0.925	0.937	0.937	S.K.P
0.863	0.065	0.864	0.863	0.863	0.967	Weighted Avg

=== Confusion Matrix ===

a	B	c	<-- classified as
29	4	0	a = S.K
5	**22**	2	b = S.K.K
2	1	**37**	c = S.K.P

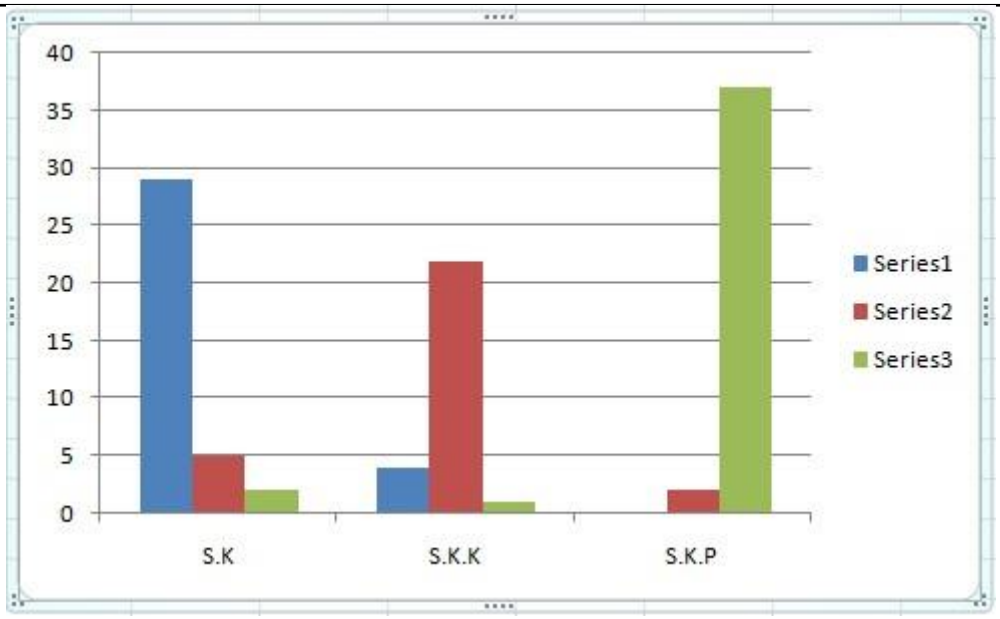

Fig 4.7: 86.27% Trees.Random Forest

The graph shows the Red, Green, and Blue it shows the performance of series 1, series 2 and series 3. The s.k shows the graph more then 25 and near about30, and s.k.k red graph showsthe class near about 20 and last green graph shows the class s.k.p is near about 40. This graphshows 87.1% accuracy result and this classifier are 86.27% Trees. Random Forest Different rice varities, these varities of rice s. k, s. k. k, s. k. p and the weighted average, the accuracy of these verities are shown in table. Confusion matrix are shown diagonal matrix classified as. These parameters show the performance of implement classifier. This table of diagonal matrix are **83,86,89.**

Chapter5

Conclusion:

In this research our major idea distinguish four verities of rice that texture analysis andtexture element are calculated ,{64x64} usingweka software. We achieved 90.1 % as maximum correctness for this work.

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