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KOMODITAS : MACHINE

Least square support vector machine analysis for the classification of paddy seeds by harvest year

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Abstract: Least square support vector machines (LSSVM) were used to classify paddy seeds harvested from 2002 to 2005 in the Jiangxi province of China, based on visible/near-infrared (vis/NIR) spectroscopy. The binary LSSVM classifier combined with a coding technique was extended for multi-class classification. To eliminate the noise and effectively extract the features of the spectral data, wavelet transform was implemented to decompose the spectral data. To evaluate the performance of wavelet coefficients, low-frequency coefficients and high-frequency coefficients were used as inputs of LSSVM classifiers. In addition to a linear kernel LSSVM classifier, a Gaussian radial basis function (RBF) kernel LSSVM classifier and a radial basis function neural network classifier were trained and tested. As a result, the RBF kernel LSSVM classifier outperformed the other classifiers with the best classification accuracy of 98% for samples in the prediction set. The results indicate that vis/NIR spectroscopy could be used to classify paddy seeds of different harvest years nondestructively, and the proposed method of integrating LSSVM with wavelet transform showed the potential for multi-class classification

Descriptors: analytical-methods. automation. classification. image-analysis. near-infrared-spectroscopy. rice. seed-quality. seeds. sorting. techniques
Geographic Location: China. Jiangxi
Identifiers: analytical techniques. Kiangsi. paddy
Organism Descriptors: Oryza. Oryza-sativa

Supplemental Descriptors: East-Asia. Asia. Developing-Countries. Eastern-China. China. Oryza. Poaceae. Cyperales. monocotyledons. angiosperms. Spermatophyta. plants. eukaryotes
Subject Codes: ff005. nn050. qq050. qq500. zz900
Supplementary Info: 32 ref.
IS

Detection algorithm for crop multi-centerlines based on machine vision

Author(s): Zhang-H. Chen-B. Zhang-L
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Abstract: The information extracted from crop rows is important in controlling an agricultural robot's travel and operations in a vision-based guidance system. Based on different objectives during the management period of wheat, the study proposes an image algorithm to determine all the centrelines of the targets in a wheat image. The colour image was converted into a gray-scale image using the colour difference 2G-R-B. A self-adaptation threshold separated the crop rows from the inter crop row spaces. The target regions and points were obtained by analysing each horizontal scan line in a binary image. The target points were clustered according to the abscissa of the target points of two adjacent scan lines. The centrelines were correctly detected by passing a known point Hough transform. The algorithm requires 0.12 s to determine all the centrelines. Test results showed that different multi-centre lines had been accurately detected in 600 wheat images among 650 images sampled under different natural and field conditions

Other Title: Detection algorithm for crop multi-centerlines based on machine vision
Language: English
Descriptors: algorithms. colour. machine-vision. robots. row-spacing. wheat
Identifiers: color. computer vision
Organism Descriptors: Triticum. Triticum-aestivum

Hot topic: Application of support vector machine method in prediction of alfalfa protein fractions by near infrared reflectance spectroscopy

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Abstract: The object of this study was to explore the potential for support vector machine (SVM) to improve the precision of predicting protein fractions by near infrared reflectance spectroscopy (NIRS). Generally, most protein fractions determined in Cornell Net Carbohydrate and Protein System (CNCPS), especially the neutral detergent insoluble protein (NDFCP) and acid detergent insoluble protein (ADFCP), could not be accurately predicted by the commonly used partial least squares (PLS) method. A recently developed chemometric method, SVM, was applied in NIRS prediction of alfalfa protein fractions in this study. Two hundred thirty alfalfa samples were scanned on a near infrared reflectance spectrophotometer, and analyzed for crude protein (CP), true protein precipitated in tungstic acid (TCP), borate-phosphate buffer-insoluble protein (BICP), NDFCP, and ADFCP. These 5 laboratory proteins and the CNCPS protein fractions A, B1, B2, B3, and C were predicted by NIRS using the PLS and SVM methods. According to PLS-NIRS regression, CP, TCP, BICP, A, and B2 obtained the determination coefficient of prediction (R_p^2) of 0.96, 0.91, 0.94, 0.94, and 0.93, and the ratios of standard deviation of prediction samples: standard error of prediction samples (RPD) values were 5.07, 3.31, 3.98, 3.96, and 3.91. Neutral detergent insoluble protein, ADFCP (fraction C), B1, and B3 were predicted with R_p^2 of 0.75, 0.83, 0.30, and 0.62, and RPD values of 1.98, 2.42, 1.20, and 1.62; Calibrated by the SVM-NIRS method, R_p^2 values of CP, TCP, BICP, NDFCP, ADFCP(C), A, and B2 achieved 0.99, 0.97, 0.97,

0.90, 0.93, 0.97, and 0.97, respectively. The RPD values of those fractions were 8.68, 8.26, 6.11, 3.08, 3.69, 5.97, and 5.81, respectively. The R-p(2) and RPD values of fractions B1 and B3 were 2.67 and 0.87 (B1) and 2.51 and 0.75 (B3) directly predicted by SVM-NIRS model. In this study, the chemical analysis results of B1 and B3 were also correlated with calculated results from TCP-BICP and NDFCP-ADFCP, which were predicted by SVM-NIRS models. The B1 protein fraction achieved R-p(2) and RPD values of 0.87 and 3.61, whereas values for B2 were 0.75 and 2.00. Data suggested that use of SVM methods in NIRS technology could improve the accuracy of predicting protein fractions. This study showed the potential of increasing the NIRS prediction accuracy to a level of practical use for all protein fractions, except B3

Other Title: Hot topic: Application of support vector machine method in prediction of alfalfa protein fractions by near infrared reflectance spectroscopy

Language: English

Descriptors: Methods and Techniques; Biochemistry and Molecular Biophysics Cornell Net Carbohydrate and Protein System

Body traits of lambs of machine milked non-dairy sheep and milk components in early lactation

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Author Affiliation: Department of Agricultural Engineering, Faculty of Agriculture, Gaziosmanpasa University, Tokat, Turkey

Abstract: In this study, the effects of machine milking on milk yield and composition and body traits of lambs were investigated in 24 Karayaka male lambs. Milk yield and milk protein content of ewes were not affected by machine milking. Milk of nursing sheep contained higher percentages of total fat than milk of machine milked sheep (P<0.05). Milk intake of lambs and milk fat were positively correlated with body weight and wither height of lambs. There was a positive correlation between daily gain of lambs and milk fat. Body measurements of lambs did not differ between

machine milking and nursing groups. There were no correlations between milk protein and body traits of lamb
Other Title: Body traits of lambs of machine milked non-dairy sheep and milk components in early lactation
Language: English
Descriptors: conformation. ewe-milk. Karayaka. lactation. lambs. liveweight. liveweight-gain. machine-milking. milk-composition. milk-fat. milk-protein. milk-yield. traits
Identifiers: body conformation. butterfat. liveweight gains. milk constituents. sheep milk
Organism Descriptors: sheep
Supplemental Descriptors: Ovis. Bovidae. ruminants. Artiodactyla. mammals. vertebrates. Chordata. animals. ungulates. eukaryotes
Subject Codes: ll110. qq010. qq500
Supplementary Info: 13 ref.
ISSN: 0019-6479

The effect of machine milking and nursing on diet selection of sheep

Author(s): Cetin-M. Cimen-M. Ozgoz-E. Gurhan-R
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Abstract: The effects of machine milking and nursing during early lactation on feed selection, plasma urea nitrogen and total protein, and milk urea nitrogen, protein and fat were investigated in Karayaka sheep. The sheep in machine milking (MM) and nursing (N) groups were allowed to select among various feed materials (ground barley, wheat bran, sunflower meal and lentil straw). The experiment lasted for 40 days including training period of 10 days. No significant differences in milk yields, total protein and urea levels in plasma and milk were found. The percentage of milk fat of sheep in the MM group was greater (P<0.02) than that of the N group. The results showed that the proportional intakes of feed materials (except sunflower meal) were similar between groups. ME, CP, Ca

and P contents of selected diets and feed intakes were also similar for both groups

Other Title: The effect of machine milking and nursing on diet selection of sheep

Language: English

Descriptors: blood-chemistry. blood-plasma. blood-protein. feed-intake. feeding-preferences. lactation. machine-milking. milk-composition. milk-fat. milk-protein. milk-yield. sheep-feeding. suckling. urea

Identifiers: butterfat. feed preferences. milk constituents. milk urea nitrogen. plasma protein. serum protein

Organism Descriptors: sheep

Supplemental Descriptors: Ovis. Bovidae. ruminants. Artiodactyla. mammals. vertebrates. Chordata. animals. ungulates. eukaryotes

Subject Codes: ll110. ll500. qq010. qq500

Supplementary Info: 13 ref.

Determination of the performance values of milking machine with pulsator

Author(s): Isik-E. Unai-H
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Abstract: The structural and functional performances of a milking machine with a pulsator were determined. There was a 55-pulsation, 1-min pulsation rate and 50 kPa vacuum value. Milking trials were conducted on 10 cows to determine the milk flow and milk quantity per animal and the energy consumption based on unit milk quantity. The process consisted on pacifier opening (phase A), full opening (phase B), closing (phase C) and full closing (phase D). It was shown that the highest milk flow was reached after 2.5 min with 3.794 kg/min and averaged 1.618-1.839 kg/min. Milk flow rate changed between 0.963 and 1.428 kg/min. The shortest milking period lasted 4 min, whereas the shortest was 9 min. The highest and lowest milk quantities were 4.160 and 9.997 kg, respectively.

There was mean unit energy consumption of 0.0143 kWh/kg milk quantity
Other Title: Determination of the performance values of milking machine with pulsator
Language: English
Descriptors: cows. dairy-cattle. dairy-cows. energy-consumption. machine-milking. milk. milk-flow. milk-production. milking-machines
Identifiers: energy use. energy utilization
Organism Descriptors: cattle
Supplemental Descriptors: Bos. Bovidae. ruminants. Artiodactyla. mammals. vertebrates. Chordata. animals. ungulates. eukaryotes
Subject Codes: ll110. nn400. pp100

Hsp90/Hsp70 chaperone machine regulation of the Saccharomyces MAL-activator as determined in vivo using noninducible and constitutive mutant alleles

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Abstract: The Hsp90/Hsp70 chaperone machine is an essential regulator of cell growth and division. It is required for activation of select client proteins, chiefly protein kinases and transcription activators and thus plays a major role in regulating intracellular signaling and gene expression. This report demonstrates, in vivo, the association of the Saccharomyces cerevisiae maltose-responsive transcription activator Mal63 (MAL-activator) with the yeast Hsp70 (Ssal), Hsp90 (Hsp82), and Hop (Stil) homologs, using a collection of inducible, constitutive, and noninducible alleles. Each class of mutant activator forms a distinctly different stable multichaperone complex in the absence of maltose. Inducible Mal63p associates with Ssal, Hsp82, and Stil and is released in the presence of maltose. Noninducible Mal63 mutant proteins bind to

Ssal alone and do not stably associate with Hsp82 or Stil. Constitutive MAL-activators bind well to Hsp82 and poorly to Ssal and Stil, but deletion of STII restores Ssal binding. Taken together, Mal63p regulation requires the formation of Hsp90/Hsp70 subcomplexes comparable to, yet distinct from those observed with previously characterized Hsp90 clients including glucocorticoid receptor and yeast Haplp. Thus, comparative studies of different client proteins highlight functional diversity in the operation of the Hsp90/Hsp70 chaperone machine

Other Title: Hsp90/Hsp70 chaperone machine regulation of the Saccharomyces MAL-activator as determined in vivo using noninducible and constitutive mutant alleles

Language: English

Descriptors: Molecular Genetics (Biochemistry and Molecular Biophysics) constitutive mutant allele

ISSN: 0016-6731

Application of support vector machine technology for the estimation of crop biophysical parameters using aerial hyperspectral observations

Author(s): Karimi-Y. Prasher-S-O. Madani-A. Kim-S

Author Affiliation: McGill University

Abstract: This study investigated the potential of support vector machine (SVM) methodology to extract information on crop growth and various biophysical parameters from airborne hyperspectral remote sensing data. The study was carried out in a corn field, consisting of a main plot with four weed control strategies (no weed control, broadleaf control, grass control, and full weed control) and a sub-plot with three nitrogen (N) fertilization rates (60, 120, 250 N kg/ha), all replicated four times. Hyperspectral data were taken in 72 narrow wavebands (409 to 947 nm) using a compact airborne spectrographic imager (CASI) sensor. Various crop physiological parameters were measured concurrently including: leaf greenness

(SPAD readings), plant height, leaf nitrogen content, and leaf chlorophyll content. The objective of the study was to evaluate the ability of SVM regression models to extract continuous vegetation variables using aerial hyperspectral observations. Several SVM models were developed to estimate the crop biophysical parameters and the grain yield. The study showed that by using reflectance data collected at the tasseling stage, crop parameters can be estimated with reasonable accuracy. Generally speaking, the coefficients of determination ($r2$) were greater than 0.9 for biomass, yield, plant height, and SPAD with the training data set. The $r2$ was slightly lower for the test data set (0.51, 0.82, 0.91, and 0.86, respectively), which is acceptable given the small size of the data set used in the study. The results of the five fold cross validation procedure indicated that the SVM results were consistent. The results were also compared with those obtained with a stepwise approach, and the SVM results were found to be superior

Other Title: Application of support vector machine technology for the estimation of crop biophysical parameters using aerial hyperspectral observations

Language: English

Language of Summary: English; French

Descriptors: hyperspectral; remote-sensing; corn; nitrogen; weeds; crop-parameters; support-vector; machine

Features extraction for eggplant fruit grading system using machine vision

Author(s): Chong-V-K. Kondo-N. Ninomiya-K. Nishi-T. Monta-M. Namba-K. Zhang-Q

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Abstract: Machine vision based grading for agricultural crops has been well developed and accepted as an attractive grading method. However, machine vision based grading for eggplant fruit is not available yet. This study reports on the attempt to develop an eggplant grading machine using six CCD cameras as the sensing

device. Feature extraction algorithms were developed to extract eggplant's features, i.e., length, diameter, volume, curvature, color homogeneity, calyx color, calyx area, and surface defect. The system could acquire six images per fruits covering the entire surface of the eggplant fruits. An agreement rate of 78.0% was achieved in the feasibility study where the machine vision based grading was compared with manual grading. The throughput of the developed system was 0.3 second per fruit. Details of the system, an outline of the algorithm, and performance results are reported in this article

Other Title: Features extraction for eggplant fruit grading system using machine vision
Language: English
Descriptors: algorithms. aubergines. colour. diameter. equipment-performance. fruits. grading. machine-vision. volume
Identifiers: brinjal. color. computer vision. eggplants
Organism Descriptors: Solanum-melongena
Supplemental Descriptors: Solanum. Solanaceae. Solanales. dicotyledons. angiosperms. Spermatophyta. plants. eukaryotes
Subject Codes: nn050. nn460
Supplementary Info: 17 ref.
ISSN: 0883-8542
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Classification of Phalaenopsis plantlet parts and identification of suitable grasping point for automatic transplanting using machine vision

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Abstract: This study develops an image-processing algorithm to segment and classify the components of Phalaenopsis tissue culture plantlets (PTCPs) and to determine a suitable grasping location on the roots for an automatic transplanting operation. The algorithm uses the nodes of the plantlet's skeleton to generate cutting lines to

separate the plantlet into its constituent leaves and roots. A Bayes classifier based on an optimal combination of color and shape features is then applied to classify the individual segments of the plantlet as either "leaf" or "root" segments. The root segment with the highest decision value based on the Bayes theorem is then selected, and the midpoint of its skeleton specified as a suitable grasping point for an automatic transplanting operation. The classification results obtained by the Bayes classifier for manually cut samples demonstrate that a classification accuracy of 99.9% is achievable given an appropriate choice of color and shape features. Implementing the optimal set of features, the proposed classifier achieves a 94.9% success rate in identifying suitable grasping points on complete PTCP plantlets. Therefore, the experimental results indicate that the proposed image-processing algorithm has the potential for integration with a robotic handling device to realize an automatic machine vision plantlet transplanting system

Other Title: Classification of Phalaenopsis plantlet parts and identification of suitable grasping point for automatic transplanting using machine vision

Language: English

Descriptors: algorithms. automation. classification. colour. cut-flowers. image-analysis. image-processing. machine-vision. plant-parts. robots. roots. shape. tissue-culture. transplanting

Geographic Location: Taiwan

Identifiers: color. computer vision. Formosa

Organism Descriptors: Phalaenopsis

Supplemental Descriptors: Orchidaceae. Orchidales. monocotyledons. angiosperms. Spermatophyta. plants. eukaryotes. South-East-Asia. Asia. Developed-Countries

Subject Codes: ff003. ff100. ff170. nn050. ss200

Supplementary Info: 19 ref.

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Development of high capacity fodder densification machine

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which only the seat and the punching rod were made of stainless steel and all others parts were of mild steel. The cost of operation, including the labor cost and depreciation was Rs. 10.20 per h. The aonla fruit after removal of seed by the machine was used for the production of intermediate moisture food by osmotic dehydration which had a good consumer acceptance

Author Variant: A. Ganachari

Other Title: Design and development of a machine for aonla seed removal

Language: English

Descriptors: dehydration. depreciation. design. farm-machinery. fruits. labour-costs. operating-costs. removal. seeds

Identifiers: labor costs

Organism Descriptors: Phyllanthus-emblica

Supplemental Descriptors: Phyllanthus. Euphorbiaceae. Euphorbiales. dicotyledons. angiosperms. Spermatophyta. plants. eukaryotes

Subject Codes: nn460

Supplementary Info: 4 ref.

Milking machines on Chilean dairy farms and their effects on somatic cell count and milk yield: a field study

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Abstract: A total of 34 dairy farms in the south central zone of Chile were evaluated in order to describe the function of the milking machines with respect to vacuum, pulsators, milklines and cluster characteristics and their relationship with somatic cell count (SCC) and milk yield (MY). An inadequate nominal vacuum level (NVL) was one factor that negatively influenced the SCC. The increase in SCC was more accentuated in milking machines with high-lines than those with mid- and low-lines. MY was also negatively influenced by

an inadequately high NVL. A higher MY value was observed in farms which had <44 kPa NVL. In all cases, effective vacuum reserve deficit (EVRD) produced a SCC above international recommendations. The EVRD effect was insignificant (P>0.05) on MY. No influence of the pulsation type on SCC and MY was observed, but in all cases, the association between pulsation and pulsator produced a SCC above international recommendations. A highly significant positive correlation between milkline height and SCC was found (r=0.41; P<0.01). Only low-lines presented a SCC within the recommended international levels. Milking machines with a small capacity cluster volume showed higher SCC. Low-lines with a large claw (300-350 ml) had lower SCC (P<0.05) compared with mid-lines. An insignificant influence of claw capacity on MY was observed. Cows with a high SCC level performed below the optimal level. Good milking machine functioning and maintenance might be the only solutions to obtain the maximum benefits in the studied farms

Other Title: Milking machines on Chilean dairy farms and their effects on somatic cell count and milk yield: a field study

Language: English

Language of Summary: spanish

Descriptors: clusters. cows. dairy-cattle. dairy-farms. dairy-performance. equipment-performance. milk-production. milk-yield. milking. milking-machines. milking-parlours. pulsators. somatic-cell-count. vacuum

Geographic Location: Chile

Identifiers: dairy parlours. milking parlors

Organism Descriptors: cattle

Supplemental Descriptors: Bos. Bovidae. ruminants. Artiodactyla. mammals. vertebrates. Chordata. animals. ungulates. eukaryotes. South-America. America. Developing-Countries. Threshold-Countries. Latin-America

Subject Codes: ll110. nn400

Supplementary Info: 34 ref.

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The RNA degradosome of Escherichia coli: An mRNA-

degrading machine assembled on RNase E

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Abstract: The RNA degradosome of Escherichia coli is a multiprotein complex involved in the degradation of mRNA. The principal components are RNase E, PNPase, RhlB, and enolase. RNase E is a large multidomain protein with an N-terminal catalytic region and a C-terminal noncatalytic region that is mostly natively unstructured protein. The noncatalytic region contains sites for binding RNA and for protein-protein interactions with other components of the RNA degradosome. Several recent studies suggest that there are alternative forms of the RNA degradosome depending on growth conditions or other factors. These alternative forms appear to modulate RNase E activity in the degradation of mRNA. RNA degradosome-like complexes appear to be conserved throughout the Proteobacteria, but there is a surprising variability in composition that might contribute to the adaptation of these bacteria to the enormously wide variety of niches in which they live
Other Title: The RNA degradosome of Escherichia coli: An mRNA-degrading machine assembled on RNase E
Language: English
Descriptors: Molecular Genetics (Biochemistry and Molecular Biophysics); Enzymology (Biochemistry and Molecular Biophysics) RNA degradosome

Development of a yam pounding machine

Author(s): Raji-A-O. Oriola-K-O
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Abstract: A simple and easy to maintain kitchen size yam pounding machine was developed, constructed and tested. The machine, powered by a 600 W electric motor was tested with two replaceable hammers; T-shaped and closed C-shaped hammers. The machine performed satisfactorily with the T-shaped hammer on yam slices not more than 40 mm in thickness. The products compared favourably with pounded yam produced with the traditional method. On the other hand, samples produced with the closed C-shaped hammers were generally unacceptable because they were full of lumps and unbroken yam pieces. Generally, the machine produced hot pounded yam within 45 seconds; hence, it is suitable for the present day nuclear families in the cities. A higher wattage electric motor rating would enhance its capacity as the machine tends to get stuck as soon as the yam turns into a thick paste if additional water is not sprinkled on it
Other Title: Development of a yam pounding machine
Language: English
Descriptors: food-processing. food-processing-equipment. food-technology. yams
Organism Descriptors: Dioscorea
Supplemental Descriptors: Dioscoreaceae. Liliales. Violales. dicotyledons. angiosperms. Spermatophyta. plants. eukaryotes
Subject Codes: nn600. qq050. qq100
Supplementary Info: 8 ref.
ISSN: 0084-5841

Detection of green apples in hyperspectral images of apple-tree foliage using machine vision

Author(s): Safren-O. Alchanatis-V. Ostrovsky-V. Levi-O
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Abstract: It is important for orchard owners to be able to estimate the quantity of fruit on the trees at the various growth stages,

because a tree that bears too many fruits will yield small fruits. Thus, if growers are interested in controlling the fruit size, knowing in advance that there are too many developing fruits will give them the opportunity to treat the tree. A machine vision-based method of automating the yield estimation of apples on trees at different stages of their growth is proposed. Since one of the most difficult aspects of apple yield estimation is distinguishing between green varieties of apples or those that are green in the first stages of growth, and the green leaves that surround them, this investigation concentrates on estimating the yield of green varieties of apples. Hyperspectral imaging was used, because it is capable of giving a wealth of information both in the visible and the near-infrared (NIR) regions and thus offers the potential to provide useful results. A multistage algorithm was developed that uses several techniques, such as principle components analysis (PCA) and extraction and classification of homogenous objects (ECHO) for analysing hyperspectral data, as well as machine vision techniques such as morphological operations, watershed and blob analysis. The method developed was tested on images taken in a Golden Delicious apple orchard in the Golan Heights, Israel, in two sessions: one during the first stages of growth, and the second just before harvest. The overall correct detection rate was 88.1%, with an overall error rate of 14.1%

Other Title: Detection of green apples in hyperspectral images of apple-tree foliage using machine vision

Language: English

Descriptors: apples. automation. crop-yield. foliage. fruits. image-processing. imagery. machine-vision

Geographic Location: Israel

Identifiers: computer vision

Organism Descriptors: Malus. Malus-pumila

Supplemental Descriptors: West-Asia. Asia. Mediterranean-Region. Middle-East. Developed-Countries. Malus. Rosaceae. Rosales. dicotyledons. angiosperms. Spermatophyta. plants. eukaryotes

Subject Codes: ff003. ff100. nn050

Supplementary Info: 23 ref.

ISSN: 0001-2351

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Design and testing of a mangosteen fruit sizing machines

Author(s): Jarimopas-B. Inprasit-C. Toomsaengtong-S
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Abstract: This research concerns the development of a rotating disk, mangosteen sizing machine for fruit growers and small entrepreneurs. The methodology comprised design, construction, testing, and engineering and economic evaluation of a laboratory prototype machine. The laboratory prototype featured slope or step-type sizing gaps. Testing of the laboratory prototype indicated that varying the two control factors (the rotating disk speed and sizing gap type) significantly affected mean contamination ratio (CR), sizing efficiency (Ew), and throughput capacity (Q) at 5% significance level. The most efficient configuration was a rotating disk speed of 21 rpm using a step-type aperture, which can be represented as CR=14.7%, EW=84.7% and Q=1,076.6 kg/hr. The laboratory prototype was used as the model for a factory prototype, which was fabricated and tested through the co-operation of the authors and the Jakawal Car Center factory in Ayuthaya, Thailand. The factory prototype is 820 mm wide, 820 mm long, 960 mm high and comprises 40 mm x 40 mm L-steel beams, a 600 mm diameter rotating disk, sizing boards, and a 370 W, 220 V electric motor. Performance testing of the factory prototype showed that minimal fruit damage (0.48%) occurred at CR=22.8% and Q=1,026 kg/hr. The sized mangosteen was very well accepted by fruit wholesalers at Prathom Mongkol fruit market in Nakhon Fathom, Thailand. An engineering economic analysis showed that the break even point and pay back period for a commercially available machine would be 46,020 kg/yr and 6 1/2 months respectively, assuming a construction cost of USD453 and a rental rate of USD2/ton. In contrast, mangosteen growers and traders can manually size mangosteen at the rate of 153.4 kg/hr/person at CR=33.7%
Author Variant: S.-T. Bundit-Jarimopas. Chouw-Inprasit

Other Title: Design and testing of a mangosteen fruit sizing machines
Language: English
Descriptors: crop-quality. design-calculations. fruits. mangosteens. prototypes
Geographic Location: Thailand
Organism Descriptors: Garcinia-mangostana
Supplemental Descriptors: Garcinia. Clusiaceae. Theales. dicotyledons. angiosperms. Spermatophyta. plants. eukaryotes. South-East-Asia. Asia. Developing-Countries. ASEAN-Countries
Subject Codes: nn050. nn460. qq050. qq500. zz100
Supplementary Info: 8 ref.
ISSN: 0084-5841

Classification of fungal infected wheat kernels using near-infrared reflectance hyperspectral imaging and support vector machine

Author(s): Zhang-H. Paliwal-J. Jayas-D-S. White-N-D-G
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Abstract: A classification algorithm was developed to differentiate healthy and infected wheat by storage fungi (Aspergillus niger, Aspergillus glaucus, and Penicillium spp.). A near-infrared reflectance hyperspectral imaging system captured hyperspectral images at 20 wavelengths spaced evenly between 1000 nm and 1600 nm. Four statistical features (mean, variance, skewness, and kurtosis) were extracted from the hyperspectral image data of single kernels at each wavelength. The statistical features at all wavelength levels composed the pattern vector of a single kernel. The dimensionality of pattern vectors was reduced by principal component analysis. A multi-class support vector machine with kernel of radial basis function was used for classification. Using the statistical features, the wheat kernels infected by Aspergillus niger, A. glaucus, and Penicillium spp. and healthy wheat kernels were

classified with accuracies of 92.9, 87.2, 99.3, and 100%, respectively. Almost perfect classification was obtained under the infected vs. healthy model. There was 10.0% misclassification between A. niger and A. glaucus infected wheat samples

Other Title: Classification of fungal infected wheat kernels using near-infrared reflectance hyperspectral imaging and support vector machine

Language: English

Descriptors: algorithms. classification. fungal-diseases. image-analysis. kernels. methodology. multispectral-imagery. near-infrared-spectroscopy. plant-pathogenic-fungi. plant-pathogens. postharvest-decay. principal-component-analysis. storage-decay. wheat

Identifiers: deterioration in storage. Hyphomycetes. methods. phytopathogens

Organism Descriptors: Aspergillus-glaucus. Aspergillus-niger. fungi. Penicillium. Triticum. Triticum-aestivum

Supplemental Descriptors: Aspergillus. Deuteromycotina. Eumycota. fungi. eukaryotes. Triticum. Poaceae. Cyperales. monocotyledons. angiosperms. Spermatophyta. plants

Subject Codes: ff610. qq050. qq111. ss300. zz100. zz900

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Development and performance test of a laser controlled land leveling machine

Author(s): Lin-JianHan. Wang-MaoHua. Lv-QingFei. Liu-Gang. Si-YongSheng. Yang-YuNuo

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Abstract: This study developed a new lower-cost laser controlled leveling system, integrated with medium-sized and small-sized tractors, for farmland leveling. The system consisted of a laser

transmitter for creating a laser beam scanned altitude level reference, a laser signal receiver, an intelligent hydraulic controller, a hydraulic control unit and a leveling bucket. A commercially available 644 nm laser transmitter was used and the main effort was in the development of the other four components and integration. Experiments were conducted for the performance test. The results showed that the system worked properly with an accuracy of approx equal to 3 cm

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Other Title: Development and performance test of a laser controlled land leveling machine

Language: English

Descriptors: appropriate-technology. automatic-control. automation. equipment-performance. hydraulics. land-levellers. lasers. levelling. performance-tests. tractors

Geographic Location: Beijing. China. Guangdong. Hebei. Sichuan

Identifiers: intermediate technology. Kwantung. laser beams. laser radiation. Peking

Supplemental Descriptors: Northern-China. China. East-Asia. Asia. Developing-Countries. Central-Southern-China. South-Western-China

Subject Codes: jj500. nn050. pp400

Supplementary Info: 18 ref.

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Combined rototilling-stubble-breaking-planting machine

Source: Soil & Tillage Research. 2007. 96 (1-2). 73-82

Author(s): Jia-HongLei. Ma-ChengLin. Li-GuangYu. Huang-DongYan. Liu-ZhaoChen

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Abstract: The combined rototilling-stubble-breaking-planting machine suitable for use in the dry farming area in northern China was developed according to the farming mode of water storage and

soil moisture conservation and the performance test and production examination were conducted. The machine uses separated structural design, which can conduct combined rototilling-stubble-breaking-planting operations, and can also be dismantled easily into an independent rototilling-stubble-breaking machine and a planter to conduct the rotilling-stubble-breaking operation or planting operation, or one machine for three purposes. The combined rototilling-stubble-breaking machine is connected with the planter via a compensation-type three-point hitch linkage, ensuring good following performance of the planter and high stability of the combined machine. The rototilling and stubble-breaking performances, the seeding stability, uniformity and evenness between rows of the planter and the performance of the fertilizing unit of the machine were measured. Tests showed that the broken stubble rate was 92%; qualified seed spacing rate: maize 85.80%, soyabean 86.50%; multiples rate: maize 7.60%, soyabean 7.85%; miss rate: maize 6.60%, soyabean 5.63%; the coefficient of variation of the spray capacity of the spray nozzles was 5.94% and the coefficient of variation of the total spray capacity 6.00%. All indexes of the machine reached the requirements stipulated in the related national standards

Author Variant: H. L. M.-C. L. L.-G. Y. H.-D. Y. L.-Z. C. Jia

Other Title: Combined rototilling-stubble-breaking-planting machine

Language: English

Descriptors: application-equipment. arid-lands. design. dry-farming. equipment. fertilizers. maize. nozzles. planters. planting. rotary-cultivation. soil-water. soyabeans. spacing. stubble-mulching. tillage. water-conservation. water-storage

Geographic Location: China

Identifiers: corn. dryland farming. rotovation. soil cultivation. soil moisture. soybeans

Organism Descriptors: Glycine-(Fabaceae). Glycine-max. Zea-mays

Supplemental Descriptors: East-Asia. Asia. Developing-Countries. Glycine-(Fabaceae). Papilionoideae. Fabaceae. Fabales. dicotyledons. angiosperms. Spermatophyta. plants. eukaryotes. Zea. Poaceae. Cyperales. monocotyledons

Subject Codes: ff005. ff100. jj700. jj900. nn400

Supplementary Info: 17 ref.

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