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AlsintanE. Sinapis, The effect of machine or hand milking on milk production, composition and SCC in mountainous Greek breed (Boutsiko) ewes, *Small Ruminant Research*, Volume 69, Issues 1-3, May 2007, Pages 242-246, ISSN 0921-4488, DOI: 10.1016/j.smallrumres.2006.02.006. (<http://www.sciencedirect.com/science/article/B6TC5-4JKHM6N-2/2/f45906f8d6563b3185bd83a1cb373b24>)

Abstract:

The aim of this work was to determine the effect of two different milking methods (machine versus hand milking) on milk yield, milk composition and somatic cell counts (SCC) in mountainous Greek Boutsiko ewes. Ninety-six ewes were divided in two groups of 48 ewes each. Milk yield, lactation number (parity) and type of lambing were taken into consideration for the separation of the ewes. One group was milked by machine and the other by hand. Milk production, milk composition (with Milkoscan 104) and SCC (with Fossomatic) were performed every 14 days, in the morning and evening milking; during the experimental period seven samplings were performed in total. The results of this study have shown that ewes milked by machine gave a greater daily milk yield as compared to those milked by hand (698 ml versus 652 ml; $P < 0,05$) and less log SCC (5.37 versus 5.62; $P < 0,05$). The composition of milk did not differ between the two treatments. Also, no phenotypic correlations were established between SCC and milk production or composition, apart from a negative correlation, which was noted between SCC and the percentage of lactose. The results of this experiment have shown that ewes of the Boutsiko breed can be milked by machine without any problems.

Keywords: Sheep; Machine milking; Hand milking; Milk production; Milk composition; SCC

Xi-Bin Zhou, Chao Chen, Zhan-Chao Li, Xiao-Yong Zou, Using Chou's amphiphilic pseudo-amino acid composition and support vector machine for prediction of enzyme subfamily classes,

Journal of Theoretical Biology, Volume 248, Issue 3, 7 October 2007, Pages 546-551, ISSN 0022-5193, DOI: 10.1016/j.jtbi.2007.06.001.

(<http://www.sciencedirect.com/science/article/B6WMD-4NXRMPP-3/2/33d812d7ba8f8a7333530beb19ed02b9>)

Abstract:

With the rapid increment of protein sequence data, it is indispensable to develop automated and reliable predictive methods for protein function annotation. One approach for facilitating protein function prediction is to classify proteins into functional families from primary sequence. Being the most important group of all proteins, the accurate prediction for enzyme family classes and subfamily classes is closely related

to their biological functions. In this paper, for the prediction of enzyme subfamily classes, the Chou's amphiphilic pseudo-amino acid composition [Chou, K.C., 2005. Using amphiphilic pseudo amino acid composition to predict enzyme subfamily classes. *Bioinformatics* 21, 10-19] has been adopted to represent the protein samples for training the 'one-versus-rest' support vector machine. As a demonstration, the jackknife test was performed on the dataset that contains 2640 oxidoreductase sequences classified into 16 subfamily classes [Chou, K.C., Elrod, D.W., 2003. Prediction of enzyme family classes. *J. Proteome Res.* 2, 183-190]. The overall accuracy thus obtained was 80.87%. The significant enhancement in the accuracy indicates that the current method might play a complementary role to the existing methods.

Keywords: Enzyme subfamily classes prediction; Support vector machine; Amphiphilic pseudo-amino acid composition

Jia Honglei, Ma Chenglin, Tong Jin, Study on universal blade rotor for rototilling and stubble-breaking machine,

Soil and Tillage Research, Volume 94, Issue 1, May 2007, Pages 201-208, ISSN 0167-1987, DOI: 10.1016/j.still.2006.07.018.

(<http://www.sciencedirect.com/science/article/B6TC6-4M7V9WD-1/2/7fc87cad56c74977a78d4daaace8f6f7>)

Abstract:

We have developed a dual-functional machine which can perform both rototilling and stubble-breaking operations. This machine is characterized by a universal rotor and blade mounting disc mechanism, thus the two operations are performed, respectively, by simple change of the blades. In this paper we present the analysis of the main parameters of the rototilling and stubble-breaking working parts and their effect on the operation quality on the basis of different agrotechnical requirements. We also present the designing considerations of the universal blade mounting system to ensure that both blades can be mounted in multi-spiral arrangements without interference. Field tests show that this dual-functional machine meets the agrotechnical requirements in the northeast of China and possesses several advantages compared with existing machines.

Keywords: Rototilling blade; Stubble-breaking blade; Universal blade rotor; Multi-spiral arrangement; Rototilling and stubble-breaking machine

E. Sinapis, P.G. Marnet, B. Skapetas, I. Hatziminaoglou, Vacuum level for opening the teat sphincter and the change of the teat end wall thickness during the machine milking of mountainous Greek breed (Boutsiko) ewes,

Small Ruminant Research, Volume 69, Issues 1-3, May 2007, Pages 136-143, ISSN 0921-4488, DOI: 10.1016/j.smallrumres.2006.01.003.

(<http://www.sciencedirect.com/science/article/B6TC5-4JBGJ67-1/2/6cde2ebfc02b6a100a96e67267a0b077>)

Abstract:

The aim of this work was to study some of the teat characteristics involved in the milking ability of dairy ewes, such as the vacuum level of the milking machine that is required for the opening of the teat canal sphincter, and the changes in the teat end wall thickness induced by milking. After weaning, 48 ewes of the mountainous Greek breed,

Boutsiko (16 ewes of the first, 16 of the second and 16 of the third and subsequent lactations) were milked for 12 weeks. Every 14 days, during the morning and evening milking, milk fractions and composition were recorded. The vacuum level that is required for the opening of teat sphincter (VOTS) was also measured before milking. The measurement of teat end wall thickness (TEWT) was performed before and after milking and the milk flow was monitored during the morning milking only. The results of this study show that during the experimental period, the ewes had a mean daily milk yield of 862.9 ml, of which the 173.3 ml corresponded to the machine stripped milk (MSM). The mean VOTS was 16.59 +/- 0.7 kPa and tended to decrease as the stage of lactation progressed. The TEWT (4.75 +/- 0.04 mm) was not modified by milking. A continuous and significant decrease in teat thickness (from 5.03 to 4.3 mm, $P < 0.05$) was observed, which suggests a reaction to intramammary pressure and milk quantity in the gland. Parity was affected significantly ($P < 0.001$) only the TEWT. The type of birth did not influence the VOTS and TEWT. Phenotypic correlations showed that by increasing the VOTS, the machine stripped milk increased as well, and so did the TEWT. These results give rise to the need for a possible reduction of the current vacuum level (44 kPa), which should be applied in the milking of this particular mountainous Greek breed of sheep.

Keywords: Sheep; Machine milking; Milking ability; Vacuum level; Teat thickness; Teat sphincter

Jia Honglei, Ma Chenglin, Li Guangyu, Huang Dongyan, Liu Zhaochen, Combined rototilling-stubble-breaking-planting machine, *Soil and Tillage Research*, Volume 96, Issues 1-2, October 2007, Pages 73-82, ISSN 0167-1987, DOI: 10.1016/j.still.2007.03.002.

(<http://www.sciencedirect.com/science/article/B6TC6-4P0VCW9-1/2/8f4d1bb28fb240baa1f5a37994faaac7>)

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 rototilling-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%, soybean 86.50%; multiples rate: maize 7.60%, soybean 7.85%; miss rate: maize 6.60%, soybean 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.

Keywords: Combined rototilling-stubble-breaking-planting machine; Rototilling-stubble-breaking machine; Planter; Compensation-type three point hitch linkage; Pest control assembly

Simona C. Baicu, Michael J. Taylor, Kelvin G.M. Brockbank, Modulating biochemical perturbations during 72-hour machine perfusion of kidneys: Role of preservation solution,

Cryobiology, Volume 54, Issue 1, February 2007, Pages 114-120, ISSN 0011-2240, DOI: 10.1016/j.cryobiol.2006.11.001.

(<http://www.sciencedirect.com/science/article/B6WD5-4MNYJYM-1/2/6b72d6ec186038ef1683cc379d9f9d8f>)

Abstract:

This study documents renal biochemistry during hypothermic machine perfusion of kidneys. It is intended to demonstrate that a comprehensive evaluation of organ viability during ex-vivo preservation is needed to increase the number of organs available for transplantation and to reduce the current renal discard rate. Porcine kidneys were hypothermically machine perfused for 72 h with either Unisol(TM)-UHK or Belzer-Machine Perfusion Solution, (Belzer-MPS). Renal perfusate samples were periodically collected and biochemically analyzed. Significant differences were measured in the renal metabolic activity between the two experimental groups while similar values for traditional parameters such as renal flow rate and vascular resistance values were recorded. The effluent of UHK perfused kidneys showed strong metabolites and dynamics ($P < 0.05$ vs. baseline), while the Belzer-MPS kidneys metabolic activity led to little or no change of the effluent biochemistry relative to baseline.

Keywords: Kidney preservation; Hypothermic machine perfusion; Renal biochemistry

Samad Jahandideh, Amir Sabet Sarvestani, Parviz Abdolmaleki, Mina Jahandideh, Mahdyar Barfeie, [gamma]-Turn types prediction in proteins using the support vector machines,

Journal of Theoretical Biology, Volume 249, Issue 4, 21 December 2007, Pages 785-790, ISSN 0022-5193, DOI: 10.1016/j.jtbi.2007.09.002.

(<http://www.sciencedirect.com/science/article/B6WMD-4PMT35J-1/2/5bc6ef894285efb536a9618f12591fa1>)

Abstract:

Recently, two different models have been developed for predicting [gamma]-turns in proteins by Kaur and Raghava [2002. An evaluation of [beta]-turn prediction methods. *Bioinformatics* 18, 1508-1514; 2003. A neural-network based method for prediction of [gamma]-turns in proteins from multiple sequence alignment. *Protein Sci.* 12, 923-929]. However, the major limitation of previous methods is inability in predicting [gamma]-turns types. Thus, there is a need to predict [gamma]-turn types using an approach which will be useful in overall tertiary structure prediction. In this work, support vector machines (SVMs), a powerful model is proposed for predicting [gamma]-turn types in proteins. The high rates of prediction accuracy showed that the formation of [gamma]-turn types is evidently correlated with the sequence of tripeptides, and hence can be approximately predicted based on the sequence information of the tripeptides alone.

Keywords: [gamma]-Turn types; Support vector machines (SVMs); Tripeptides

Hui-Ling Huang, Fang-Lin Chang, ESVM: Evolutionary support vector machine for automatic feature selection and classification of microarray data, *Biosystems*, Volume 90, Issue 2, September-October 2007, Pages 516-528, ISSN 0303-2647, DOI: 10.1016/j.biosystems.2006.12.003.

(<http://www.sciencedirect.com/science/article/B6T2K-4MKCH1D-1/2/0d69706b2e11d106523ca54b82621742>)

Abstract:

An optimal design of support vector machine (SVM)-based classifiers for prediction aims to optimize the combination of feature selection, parameter setting of SVM, and cross-validation methods. However, SVMs do not offer the mechanism of automatic internal relevant feature detection. The appropriate setting of their control parameters is often treated as another independent problem. This paper proposes an evolutionary approach to designing an SVM-based classifier (named ESVM) by simultaneous optimization of automatic feature selection and parameter tuning using an intelligent genetic algorithm, combined with k-fold cross-validation regarded as an estimator of generalization ability. To illustrate and evaluate the efficiency of ESVM, a typical application to microarray classification using 11 multi-class datasets is adopted. By considering model uncertainty, a frequency-based technique by voting on multiple sets of potentially informative features is used to identify the most effective subset of genes. It is shown that ESVM can obtain a high accuracy of 96.88% with a small number 10.0 of selected genes using 10-fold cross-validation for the 11 datasets averagely. The merits of ESVM are three-fold: (1) automatic feature selection and parameter setting embedded into ESVM can advance prediction abilities, compared to traditional SVMs; (2) ESVM can serve not only as an accurate classifier but also as an adaptive feature extractor; (3) ESVM is developed as an efficient tool so that various SVMs can be used conveniently as the core of ESVM for bioinformatics problems.

Keywords: Classification; Gene expression; Intelligent genetic algorithm; Microarray data analysis; Support vector machine

Carolina Sanchez-Hernandez, Doreen S. Boyd, Giles M. Foody, Mapping specific habitats from remotely sensed imagery: Support vector machine and support vector data description based classification of coastal saltmarsh habitats,

Ecological Informatics, Volume 2, Issue 2, 1 June 2007, Pages 83-88, ISSN 1574-9541, DOI: 10.1016/j.ecoinf.2007.04.003.

(<http://www.sciencedirect.com/science/article/B7W63-4NWN3K1-1/2/0fc66ee8f8f7ede96a436845c408b40a>)

Abstract:

Remote sensing has considerable potential for the provision of information on the distribution of habitats that may be used to inform a variety of activities such as those required through the European Union's Habitats Directive. Such programmes are often resource-limited with a need for innovative methods that optimise resource use. This paper explores two approaches to resource savings when mapping habitats from remotely sensed imagery. The first approach realises that in an area of study often interest is focused on a specific habitat with the remaining land cover classes in the region of no importance. In such circumstances conventional statistical supervised

classification analyses may be inefficient and yield a map of sub-optimal accuracy. The second approach seeks to further reduce the training requirements of a supervised classification. For this support vector machine (SVM) based approaches to classification are explored to map coastal saltmarsh habitats in North Norfolk, UK from a Landsat Enhanced Thematic Mapper (ETM+) image. A series of classifications using SVM based approaches and the Maximum Likelihood classifier (MLC) were undertaken. Classification accuracies were significantly higher using the SVM based approaches (e.g., 92.0% overall accuracy) than the MLC (64.8% overall accuracy). The SVM based classifications were demonstrated to be attractive for mapping a priority habitat in that the focus is on the habitat of interest to be mapped throughout the classification process resulting in a reduced need for training data. Moreover, it was shown that this can be further optimised through the use of intelligent training. This approach, based on the use of the support vector data description (SVDD), saved resource requirements even further in that training data were required only for the class of interest and yet still obtained high classification accuracies (95.2% overall accuracy). The wider adoption of SVM based classification of remotely sensed imagery is advocated for use in conservation activities.

Keywords: Remote sensing; Habitat; Saltmarsh; One-class classification; Support vector machines; Support vector data descriptor

Frantisek Kumhala, Milan Kroulik, Vaclav Prosek, Development and evaluation of forage yield measure sensors in a mowing-conditioning machine, *Computers and Electronics in Agriculture*, Volume 58, Issue 2, September 2007, Pages 154-163, ISSN 0168-1699, DOI: 10.1016/j.compag.2007.03.013. (<http://www.sciencedirect.com/science/article/B6T5M-4NNPC96-1/2/c080f7f82c3c05171af53c084db7b1af>)

Abstract:

The main aim of this research was to develop and evaluate sensor system to create forage yield maps on a three-point linkage type of rotary mower-conditioner. The method was based on the mowing machine conditioner's power requirement measured by a torque sensor or on material change in momentum measured by a curved impact plate.

Laboratory measurements were taken to determine the dependence of conditioner power input and signals from the impact plate on material mass flow. A mixture of grass and alfalfa was used. There was a very good linear relationship between the conditioner's power, impact force from an impact plate, and material feed rate through the mower. The calculated coefficients of determination (R^2) were about 0.95. It was possible to differentiate a material feed rate difference 0.5 kg s⁻¹ using either method.

The effects of material changes and mower parameters on the accuracy of feed rate measurement were then measured. It was observed that the results from torque sensor was influenced by crop variety, maturity and intensity of conditioning. The same influence was not observed for impact plate.

A field of 0.54 ha was then harvested. A comparison of data from the torque sensor and impact plate with data from hand measurement were made by means of statistical and geostatistical analysis. Conditioner power input measurement and crop impact force were used to create grass yield maps.

Keywords: Yield maps; Grass; Alfalfa; Mowing machine; Conditioner; Impact plate; Torque measurement

Phil F. Culverhouse, Human and machine factors in algae monitoring performance, *Ecological Informatics*, Volume 2, Issue 4, December 2007, Pages 361-366, ISSN 1574-9541, DOI: 10.1016/j.ecoinf.2007.07.001.

(<http://www.sciencedirect.com/science/article/B7W63-4PKG64B-1/2/78ec84dc7dae6e40dfaeec54d322cbc>)

Abstract:

We all take our visual systems for granted, and often assume we are always 'near perfect' observers. This is not the case; expert visual recognition is complex and can be error prone. Starting with examples that define the problem I will explore some of the issues of recognition where expert judgements are required.

In addition to 'expert' effects, there are a number of cognitive factors that can severely affect performance, including fatigue, boredom, recency effects, positivity bias and short-term memory effects. Experimental evidence of the impact of these on performance are presented and discussed.

The specimen identifications generated by experts are useful not only to ecology, but to researchers developing systems for automatic labelling of marine plankton. Comparisons of performance are presented, where human experts have been pitted against machines to label plankton. Consensus of opinion is important in reducing errors, yet it is the norm for experts to operate alone. The shortcomings of man and machines engaged in plankton recognition are reviewed and the future of automation is assessed.

Keywords: Human factors; Man machine performance; Plankton labelling; Machine vision; Natural object categorisation

Sergio Bermejo, Brais Monegal, Joan Cabestany, Fish age categorization from otolith images using multi-class support vector machines,

Fisheries Research, Volume 84, Issue 2, April 2007, Pages 247-253, ISSN 0165-7836, DOI: 10.1016/j.fishres.2006.11.021.

(<http://www.sciencedirect.com/science/article/B6T6N-4MC12HB-2/2/5f75470ebe47c36b6bec9c92f95bdbf9>)

Abstract:

Otoliths have traditionally been used to estimate fish age. However, many factors influence changes in otolith shape, so manual classification remains a complicated task. Very recently, statistical learning techniques have been proposed for automating such a process. We propose performing automatic fish age classification using otolith images (in cases in which growth rings are not properly displayed or are unavailable), morphological and statistical feature-extraction methods and multi-class support vector machines. The results of our experiments, in which we classified cod ages from otolith images, demonstrate the effectiveness of the approach.

Keywords: Automated fish aging; Otolith images; Statistical learning; Support vector machines

M.R. Chandraratne, D. Kulasiri, S. Samarasinghe, Classification of lamb carcass using machine vision: Comparison of statistical and neural network analyses, *Journal of Food Engineering*, Volume 82, Issue 1, September 2007, Pages 26-34, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2007.01.003.

(<http://www.sciencedirect.com/science/article/B6T8J-4MX569N-1/2/d7d4cde9c1078dea1c79a653384c0c0f>)

Abstract:

In this study, the ability of artificial neural network (ANN) models to predict the lamb carcass grades using features extracted from lamb chop images was compared with multivariate statistical model (discriminant function analysis (DFA)) with respect to the classification accuracy. Twelve geometric features were extracted from each of the acquired lamb chop images. In addition, 136 texture features (90 co-occurrence, 10 run length and 36 grey-level difference histogram) were also extracted from the acquired images.

Four sets of reduced features comprising six geometric, eight co-occurrence texture, four run length texture and four grey-level difference histogram features were generated based on the results of dimensionality reduction. The four sets of reduced features, individually and in different combinations, were utilised for classification using ANN and DFA.

Several network configurations were tested and the classification accuracy of 96.9% was achieved from the three-layer multi-layer perceptron (MLP) network. Its performance was 12% better than that from the DFA. Geometric features play a very important role in classification. Co-occurrence features also play an equally important role in classification.

Keywords: Computer vision; Machine vision; Image analysis; Texture features; Lamb grading; Meat quality; Artificial neural networks; Co-occurrence matrix; Run length matrix; Grey-level difference histogram

B. Jarimopas, N. Ruttanadat, Development of a young coconut fruit trimming machine, *Journal of Food Engineering*, Volume 79, Issue 3, April 2007, Pages 752-757, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.01.082.

(<http://www.sciencedirect.com/science/article/B6T8J-4JXY3HG-1/2/f7753740bed455ba8bf85821c4f34091>)

Abstract:

A project was initiated to design, construct, test, and evaluate a prototype young coconut trimming machine. The purpose of the design was to trim most of the outer husk so that the coconut looked attractive and could easily be cut open. The prototype was based on the lathe cutting machine mechanism and was composed of a lathe machine with a body-trimming knife, a shoulder-trimming knife, a base cutting knife, and clamping mechanisms. In operation, the body knife first pared the midsection of the fruit. Following this, the shoulder-knife trimmed the top to form a conical shape, and finally the base cutting knife sliced the bottom of the fruit to form a flat underside. In this study, the key design parameters and their optimum settings were determined. The angle between the cutting edge of the body knife and the Y-axis perpendicular to the rotating axis of the fruit (X-axis) was 76[degree sign]; the angle between the cutting edge of the shoulder-knife and the X-axis was 56[degree sign]; and the knife angle between the

knife and the XY-plane was 61[degree sign]. The rotating speed of the fruit - which was newly harvested - was 300 rpm. Based on these design parameters, a commercial prototype was manufactured and tested. This prototype has the capacity to trim 21 fruit/h, with the finished product on average containing 1.1% of untrimmed green area and 0.2% of fibrous area. The trimmed fruit were accepted by fruit traders and exporters.

Keywords: Coconut; Trimming

Antonio Bahamonde, Jorge Diez, Jose Ramon Quevedo, Oscar Luaces, Juan Jose del Coz, How to learn consumer preferences from the analysis of sensory data by means of support vector machines (SVM),

Trends in Food Science & Technology, Volume 18, Issue 1, January 2007, Pages 20-28, ISSN 0924-2244, DOI: 10.1016/j.tifs.2006.07.014.

(<http://www.sciencedirect.com/science/article/B6VHY-4M3BC5C-2/2/75aeafaa0f0264e2a296fa83f8b1d487>)

Abstract:

In this paper, we discuss how to model preferences from a collection of ratings provided by a panel of consumers of some kind of food product. We emphasize the role of tasting sessions, since the ratings tend to be relative to each session and hence regression methods are unable to capture consumer preferences. The method proposed is based on the use of Support Vector Machines (SVM) and provides both linear and nonlinear models. To illustrate the performance of the approach, we report the experimental results obtained with a couple of real world data sets.

Bundit Jarimopas, Pramote Kuson, A young-coconut-fruit-opening machine,

Biosystems Engineering, Volume 98, Issue 2, October 2007, Pages 185-191, ISSN 1537-5110, DOI: 10.1016/j.biosystemseng.2007.06.008.

(<http://www.sciencedirect.com/science/article/B6WXV-4PFFD27-1/2/1f416fad21fc4a11ab5a6fcc7d6f101f>)

Abstract:

The purpose of this research was to design, construct, and evaluate a prototype machine for opening young coconut fruit. The design concept was that a trimmed coconut could be opened by causing a small sharp knife to gradually move and shear off a circular section of the husk and shell at the top of the rotating fruit. The prototype consisted of a fruit holder, a height control mechanism, a knife and its feed controller, and a power transmission system. In operation, the small stainless-steel knife slowly penetrates through the husk and shell of the turning fruit in a direction approximately perpendicular to its surface. The rotation of the fruit causes the husk and shell to be cut by the sharp edge of the knife, which results in the formation of a circular opening at the top of the fruit. In this study, the key design parameters and their operation settings were determined as follows: the angle between the knife and the rotating plane (horizontal) was 50[degree sign]; the angle between the knife cutting edge and the tangential line to the circular opening was 50[degree sign]; the knife feeding speed was 50 mm/min; and the fruit rotation speed was 80 rpm.

Based on these design parameters, a commercial prototype was manufactured and tested. The prototype had the capacity to open an item of fruit at an average time of 30

s. A 58-mm-diameter opening was cut and a mean 0.2% of the juice was spilled, while the juice that remained contained 0.2 g of fine pieces of shell and husk. The mechanically opened coconuts were well received by consumers.

B. Jarimopas, S. Toomsaengtong, C. Inprasit, Design and testing of a mangosteen fruit sizing machine,

Journal of Food Engineering, Volume 79, Issue 3, April 2007, Pages 745-751, ISSN 0260-8774, DOI: 10.1016/j.jfoodeng.2006.01.083.

(<http://www.sciencedirect.com/science/article/B6T8J-4JS2058-1/2/e3791e8b98f9ed4779cf2c9a1964db29>)

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 basis of design is characterized by a rotating conical-shape disk and a metering board with gaps of increasing size arranged along the periphery of the disk. Mangosteens are fed onto one section of the rotating disk and the combined centrifugal and gravitational force moves the fruit toward the periphery until contact with the metering board is attained. The tangential force then rolls the fruit along the metering board, where they are sized and allowed to drop through gaps according to their dimensions. Design parameters included disk diameter, disk speed and type of metering gap. Testing of the laboratory prototype was statistically factorial in completely randomized design, featuring two control factors (namely, metering gap type and disk speed) and three performance evaluation parameters: mean contamination ratio, sizing efficiency (Ew), and throughput capacity (Q). Results showed that the rotating disk speed and metering gap type significantly affected Ew, and Q at 5% significance level. The most efficient configuration was a rotating disk speed of 21 rpm using a step-type metering gap, resulting in Ew = 84.7% and Q = 1076.6 kg/h. A factory prototype of the same scale was developed with reference to the optimum design parameters of the laboratory model. The factory model, which contained a 400 mm feed opening and a 600 mm diameter disk, was tested with 650 kg, mixed size, newly harvested mangosteens. Performance testing of the factory prototype showed that minimal fruit damage (0.48%) occurred at Ew = 84.7% and Q = 1026 kg/h. The machine under review showed better performance than currently existing commercial models and the sized mangosteens were well accepted by fruit wholesalers. An engineering economic analysis showed that the break even point and pay back period for the factory model would be 46,020 kg/yr and 18 months, respectively.

Keywords: Mangosteen; Sizing

J. Liang, R. Du, Model-based Fault Detection and Diagnosis of HVAC systems using Support Vector Machine method,

International Journal of Refrigeration, Volume 30, Issue 6, September 2007, Pages 1104-1114, ISSN 0140-7007, DOI: 10.1016/j.ijrefrig.2006.12.012.

(<http://www.sciencedirect.com/science/article/B6V4R-4MTC6J3-4/2/c2890d5d17b1ba4a6a18677a190024c8>)

Abstract:

Preventive maintenance plays a very important role in the modern Heating, Ventilation and Air Conditioning (HVAC) systems for guaranteeing the thermal comfort, energy saving and reliability. Its key is a cost-effective Fault Detection and Diagnosis (FDD) method. To achieve this goal, this paper proposes a new method by combining the model-based FDD method and the Support Vector Machine (SVM) method. A lumped-parameter model of a single zone HVAC system is developed first, and then the characteristics of three major faults, including the recirculation damper stuck, cooling coil fouling/block and supply fan speed decreasing, are investigated by computer simulation. It is found that the supply air temperature, mixed air temperature, outlet water temperature and control signal are sensitive to the faults and can be selected as the fault indicators. Based on the variations of the system states under the normal and faulty conditions of different degrees, the faults can be detected efficiently by using the residual analysis method. Furthermore, a multi-layer SVM classifier is developed, and the diagnosis results show that this classifier is effective with high accuracy. As a result, the presented Model-Based Fault Detection and Diagnosis (MBFDD) method can help to maintain the health of the HVAC systems, reduce energy consumption and maintenance cost.

Keywords: Air conditioning; Process; Detection; Anomaly; Maintenance; Conditionnement d'air; Procédé; Détection; Anomalie; Maintenance

Ho-Joon Lee, Hyun-Jin Park, Jin-Woong Jeong, Dongman Kim, Manjeet S. Chinnan, Effect of electrolyzed water treatments on the quality of hand- and machine-peeled yams (*Dioscorea* spp.) during cold storage, LWT –

Food Science and Technology, Volume 40, Issue 4, May 2007, Pages 646-654, ISSN 0023-6438, DOI: 10.1016/j.lwt.2006.05.006.

(<http://www.sciencedirect.com/science/article/B6WMMV-4K9C57F-1/2/ee6ab642dc82bed44cee73bad657735c>)

Abstract:

The effect of electrolyzed water treatment on the quality of yams by different peeling methods during cold storage was evaluated. The turbidity of the immersion solution increased with extensive storage time while total sugar of yams exhibited the tendency to lessen. The composition of free sugars ranged in the order of fructose>glucose>sucrose except for the samples processed by hand-peeling electrolyzed water and anhydrous storage. The machine peeling showed the suppression of microorganisms that was 1 log cycle lower than hand peeling except EW-2-S. In both hand- and machine-peeled treatments of immersion storage, the effectiveness of the suppression of microorganisms was in the order of 0.6% acetic acid (AA)>EW-1-S>EW-2-S. The results of sensory characteristics of hand-peeled yam were slightly higher than the machine-peeled yam. Overall acceptance of sensory characteristics were: the sample processed by electrolyzed water and hydrous treatment (EW-1-S, EW-2-S)>the sample processed by electrolyzed water and anhydrous storage (EW-1-NS, EW-2-NS)>the sample processed by 0.6%AA and hydrous storage (0.6%AA). The results show that electrolyzed water and hydrous storage is effective on the storage of yams.

Keywords: Electrolyzed water; Yam; Peeling method

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Abstract:

Experiments with a new concept for the precise application of herbicides in a seed line have been conducted. The concept combines plant recognition, micro-dosing and autonomous robotics. A machine vision system recognises objects to be sprayed, and a micro-dosing system targets very small doses of liquid at the detected objects, while the autonomous vehicle takes care of the navigation. The experiments were carried out under controlled indoor conditions. The results show that the spray liquid can be applied at subcentimetre accuracy and that the application rate can be reduced by two orders of magnitude compared to recommendations used for conventional broadcast spraying.

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R.G. Oliveira, R.Z. Wang, C. Wang, Evaluation of the cooling performance of a consolidated expanded graphite-calcium chloride reactive bed for chemisorption icemaker,

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Abstract:

The cooling performance of a consolidated composite reactive bed made from expanded graphite impregnated with CaCl₂ was experimentally assessed under different evaporation and heat sink temperatures. The compound presented a specific cooling power (SCP) higher than 1000 W kgSalt⁻¹ at several studied conditions. The calculated coefficient of performance (COP) was about 0.35 when the amount of refrigerant consumed in the reaction was 0.80 kg kgSalt⁻¹. Both SCP and COP changed with the cycle time, and thus, with the degree of the reaction. The synthesis time to maximise the SCP, under any studied condition, was about 5 min, and the absorbed quantity greatly varied among the different operation conditions. When compared to the time necessary to obtain an absorbed amount of 0.80 kg kgSalt⁻¹, the synthesis time of 5 min could improve the SCP in about 15-68%, however, COP would be deployed in about 14-50%.

Keywords: Ice maker; Adsorption system; Ammonia; Graphite; Calcium chloride; Heat recovery; Experiment; Performance; COP; Fabrique de glace; Systeme a adsorption; Ammoniac; Graphite; Chlorure de calcium; Recuperation de chaleur; Experimentation; Performance; COP

