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Journal of
Scientific &
Industrial
Research

CSIR-National Institute of Science Communication And Policy Research
New Delhi, INDIA

Journal of Scientific & Industrial Research

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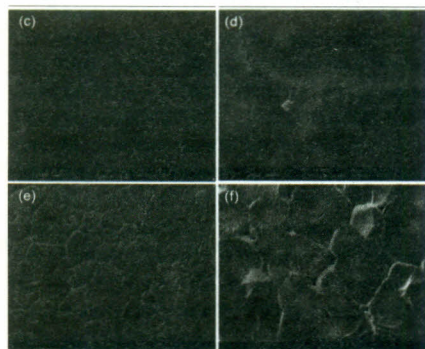Variable displacement axial piston pump can be used in a hydraulic system as the primary source of fluid power, which is suitable for high pressure and high efficiency. The power can be transfer in a hydraulic system with the help of the fluid medium. The oil leakage problem in various parts of the pump, especially the internal leakages in the piston-cylinder, swash plate-slipper pad and valve plate-cylinder block, seriously affect the performance of the pump. Therefore, it is important to know the properties of the fluid and its effect on the system performance. To study the performance of an axial piston pump, a non-linear mathematical model has been developed. The developed model has been validated with the existing results. The validated pump model has been used for performance analysis of the system. Moreover, the influence of hydraulic mineral oil at different temperatures on the piston chamber pressure, output power, and leakage flow in piston-cylinder has been explored. The present investigation has been performed in MATLAB Simulink 14a environment. The simulation result shows that the pump operating temperature range can be set as 30°C to 60°C for moderate ripple and output chamber pressure.

Neeraj Kumar, Rahul Kumar, Bikash Kumar Sarkar and Subhendu Maity
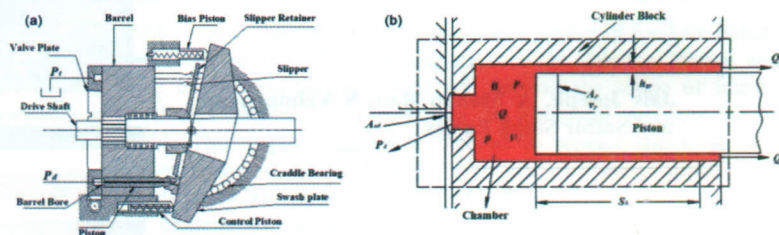
### Earth, Environment & Atmospheric Sciences

Polymer blending is a productive technique for granting attractive properties in polymeric materials which are advantageous for the packaging industry. In the present investigation, blended films of chitosan/poly (ethylene oxide) (PEO) were synthesized in different proportions of weight in the presence and absence of glycerol. Presence of distinctive peaks of chitosan and PEO at 1656 cm^{-1} and 843 cm^{-1} separately confirms the blending of chitosan/PEO. Simultaneously widening of peaks at 3380 cm^{-1} and 1656 cm^{-1} can be credited to the inter-molecular hydrogen bonding between chitosan/PEO films which thereby support blending. The physico-mechanical, barrier, optical, thermal, surface morphology and biodegradation properties of chitosan and PEO blended films with and without glycerol were estimated. It was seen that the tensile strength of the blended films diminished. Haze values of chitosan/PEO blended films with glycerol (20%) diminished from 17.7% for C100 to 3.7% for pure PEO bringing about an increase in transparency of the films that could be due to the plasticized effect. The outcomes indicate that in the presence of glycerol (20%), there is an increment of the elongation at break by more than 150%, inferring that these chitosan/PEO films could be suitably used in elastic and stretchable packaging. These films with high WVTR values can be utilized for fresh produce to control moisture evaporation and upgrades their shelf life. These films biodegrade or disintegrate within five weeks.

Jagadish R S, Manisha, Asha Srinivas, Baldevraj, Nandini K E, Ashima Srivastava

Civil Engineering

956   **Analysis of Surrogate Safety Performance Parameters for an Interurban Corridor**

Traditionally, road safety performance evaluation is an analysis of crash data from the past. However, methods of analysis from crash data have some well-known limitations from an analytical point of view. These limitations include small data samples causing statistical issues in analysis, under reporting of crashes and very little information about behavioral and environmental aspects at crash time. The micro simulation combined with traffic conflict technique enables the transportation engineers to investigate the safety performance of a corridor without using the crash data. Surrogate Safety Assessment Model (SSAM), utilizes simulated vehicle trajectories from the micro simulation software to investigate conflict severity and locations. In this study, safety performance evaluation is carried out of an interurban corridor of 24.3 km stretch from Gurugram to Faridabad in state of Haryana (India) using simulation software VISSIM (Verkehr In Städten – SIMulationsmodell) and SSAM. Simulated vehicular trajectories were generated and analyzed using SSAM to identify potential conflicts. The surrogate safety measures Time to Collision (TTC), Post Encroachment Time (PET) and Max ΔV are obtained by an analysis from SSAM model for all the three homogeneous sections such as midblock, curve section and intersections separately. The approach presented in the paper helps in the identification of inter-urban corridor locations prone to road crashes and hence serves as a proactive alternative as opposed to historical crashes based analyses.

Jais Joseph, A Mohan Rao, S Velmurugan and Satbir Singh Puwar

Typical Intersection   Typical Curve Section   Typical Midblack

Typical Signal Phase Diagram
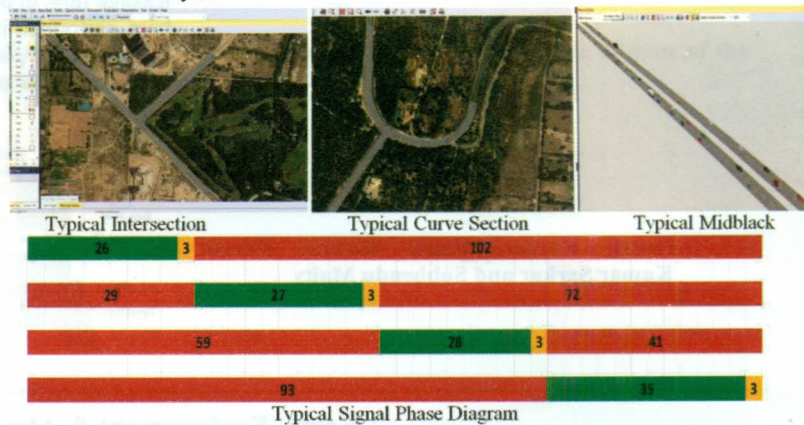
966   **A Study on the Examination of the Geologic Structure in terms of Rail Transportation**

Rail systems have an important place among the types of transportation. Although it was preferred for intercity transportation in the past, but now-a-days it is frequently preferred in urban roads. Some rail system structures move from the ground surface, while others move under the ground. Various geotechnical researches have been carried out for rail systems moving under the ground. However, for the rail vehicles moving on the ground surface are generally placed on the highway route, ground parameters are not taken into consideration. This situation can cause serious rail system accidents. This study has been conducted in Turkey's Erzurum drilling planned light rail system in terms of soil properties, it was evaluated by survey results of drilling borehole, microtremor, and multichannel analysis of surface waves (MASW). According to the results of this study, a part of the light rail system (LRS) route was found to be insufficient in terms of ground safety. For this reason, improvement in the ground or revision of the route has been suggested.

**Emre Kuşkapan, ÖmerLütfü Aydın and Muhammed Yasin Çodur**

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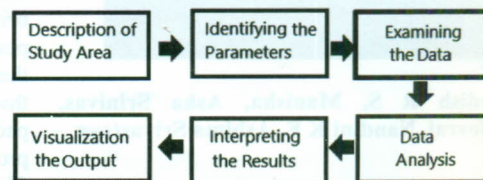
Electronics and Telecommunication

In television, mobile and digital signal processing applications, efficient multiband filters have great usage. The proposed architecture gives the Reconfigurable Finite Impulse Response (FIR) filter with multiple pass bands. Implementation of architecture utilizes FIR filter with control logic and frequency selection circuit. By adjusting the parameters of the filter, proper bandwidth of the pass band can be achieved and the ripple content in the pass band and stop band can be controlled. The efficient way to adjust the bandwidth is to choose the effective value of the filter length and coefficients. The area efficient multiple passband FIR filter using control logic has been proposed with order (n = 4 and 11). Target device that has been selected for implementation is Field Programmable Gate Array (FPGA) Virtex 4 Device. The Look-Up Tables (LUT) utilization for the implemented architecture with length of filter (n = 11) is observed to be 6%.

S N Raju Kalidindi, Sudheer Kumar Terlapu and M Vamshi Krishna
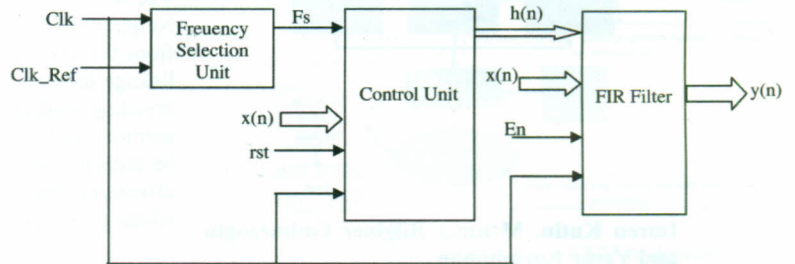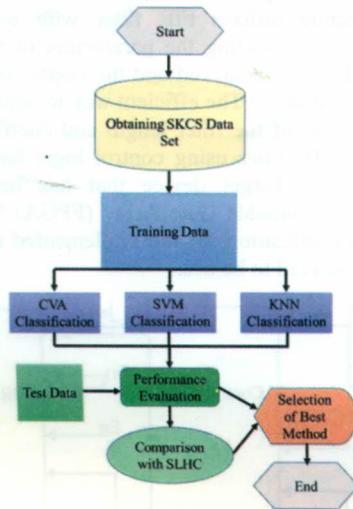
In the 21st Century, agriculture still remains the major source of food for human beings and it has far shadowed other sources such as hunting, fishing and gathering. Since environmental conditions are beyond the scope of human control, plant illness identification is acting as a critical position in the agricultural field. This paper suggests a method to replace the traditional methods of identifying disease through the use of "image-processing" techniques. In this study, an image of the leaf of a diseased plant has been taken using a digital camera. Three segmentation algorithms namely Green Pixel Masking, "CIE L*a*b colour space" extraction and H element of HSV extraction have been used to split the image into diseased and healthy regions. The diseased region is then used to calculate 13 parameters which are utilized as inputs by a pre-trained neural network which utilizes "feed-forward back propagation algorithm" to determine the final output. The proposed methodology has achieved a maximum accuracy of 95.62% for Apple leaves, 91.62% for Grape leaves and 91.1% for Tomato leaves.

S Thenmozhi, R Jothi Lakshmi, Kumudavalli M V, Irshadh Ibrahim and Rekha Mohan

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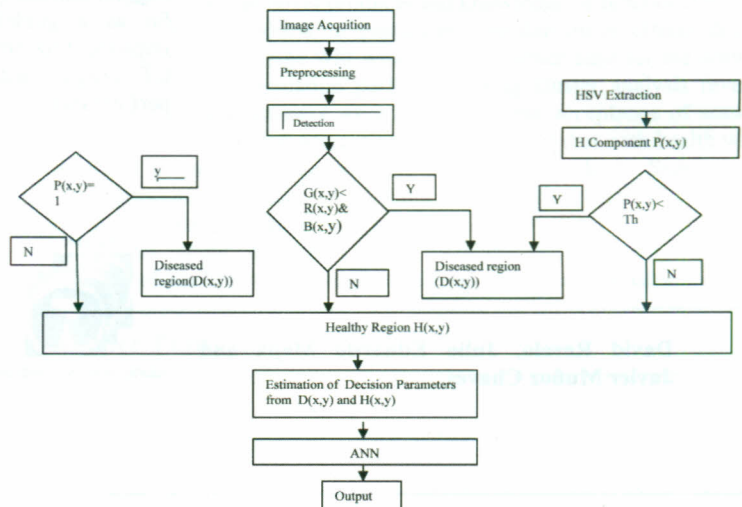
Computer Science & Information Technology

The properties related to market value, milling, classification, storage, and transportation of bread wheat are determined by using some important physical quality characteristics such as weight, shape, dimensions, and hardness of wheat kernels. It is possible to measure all these features using single kernel characterization system (SKCS). Classification of wheat genotypes using computer-based algorithms is crucial to determine the most accurate physical quality classification for breeding studies. In this paper, four commercial wheat cultivars (Altay-2000, Bezostaja-1, Harmankaya-99, and Kate A-1) and six doubled haploid (DH) wheat genotypes are studied to classify wheat cultivars and DH wheat genotypes separately. In the classification stage, feature vectors constructed from measured characters namely, kernel weight, diameter, hardness, and moisture are applied to well-known classifiers such as Common Vector Approach (CVA), Support Vector Machines (SVM) and K-Nearest Neighbor (KNN). Satisfactory results especially for the training set are obtained from the experimental studies. Classification results are compared with single linkage hierarchical cluster (SLHC) analysis, which is the most widely used in breeding studies. Recognition of clustered genotypes in all three classification methods and dendrograms present similar results. The SVM model is found to be outperformed over other methods for studied characters and could therefore effectively be utilized for characterizing, classifying and/or identifying the wheat genotypes.

COVID-19 disease is considered a new challenge around the world. Molecular testing is frequently used, aiming an early detection. However, due to its complexity in the sampling protocol and delay diagnostic, it makes critical the time to decisions on treatment or clinical interventions. In this work, the deep learning technique was adopted to evaluate the performance of 4 systems based on convolutional neural networks (VGG16, VGG19, ResNet50, and MobileNet) to support the diagnosis of COVID-19. CNN models were trained and tested using 340 CT images of patients diagnosed with COVID-19, and the same numbers of images of patients without viruses, 1700 images were obtained for each class using data-augmentation. On these images sets two types of pre-processing were performed normalization and entropy. The parameters: accuracy, recall, precision, and F1Score were used as evaluation metrics. The study found that the best performance in the classification of CT images of patients with COVID-19 was obtained by the MobileNet network with normalization pre-processing attaining 98.04% accuracy. These findings suggest that the type of pre-processing influences CNN's performance strongly. So as a guideline for future development, attention must be paid to implementing pre-processing modules dedicated to highlighting the features of CT images image of COVID-19 positives cases to improve the CNN performance.
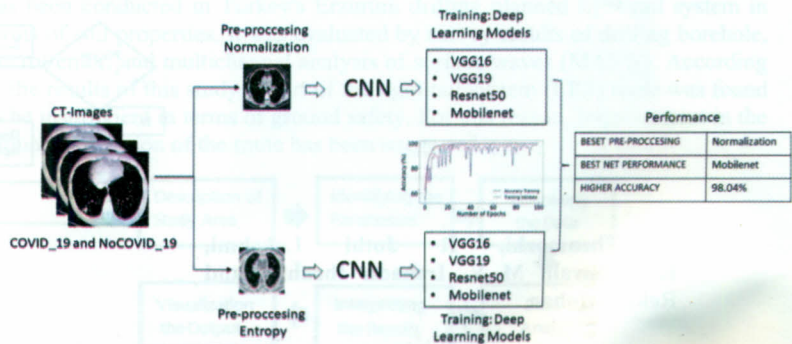
Getting immediate and appropriate care for the victims of Road Traffic Accidents (RTAs) in countries like India with huge population is a challenging job. In this paper a new hybridized evolutionary algorithm has been proposed for hyper-parameter tuning of the hyper-parameters of the prediction models using which mortality prediction of victims of RTAs in India have been performed. The proposed methodology Opp-SGO-DE has been used for parameter tuning in prediction algorithms like Random Forest (RF) and Support Vector Machine (SVM) and promising results were found from the experimentation. In RF, accuracy was increased from 0.75 to 0.82 and F1-score was increased from 0.66 to 0.77 in dataset-1 and accuracy was increased from 0.66 to 0.75 and F1-score was increased from 0.62 to 0.65 in dataset-2. In SVM, accuracy was increased from 0.63 to 0.74 and F1-score was increased from 0.58 to 0.67 in dataset-1 and accuracy was increased from 0.56 to 0.62 and F1-score was increased from 0.54 to 0.575 in dataset-2.

Junali Jasmine Jena and Suresh Chandra Satapathy
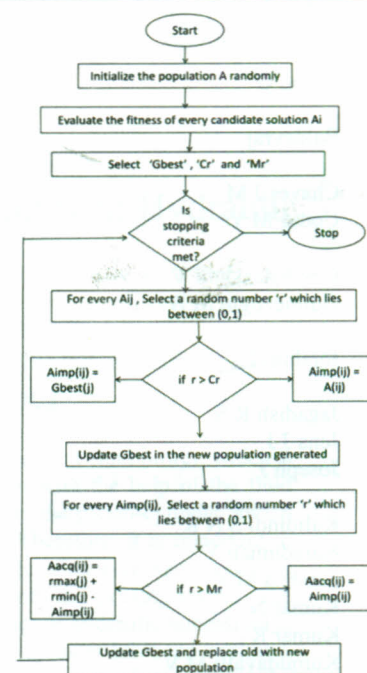
Management of Industry and Policy Implementation

The influence of consumer perception on acceptability of new seaweed incorporated functional foods was studied by collecting responses from consumers across Kerala. The factors influencing consumers to try novel functional foods based on seaweed were identified through a survey of respondents frequenting popular shopping malls, super markets, discount stores and traditional retail shops in Ernakulam and Palakkad districts of Kerala. Respondents belonged to Low :<₹0.5 million (38%) , Medium : ₹0.5 million – ₹1 million (49%) and High : >₹1 million (13%) annual income groups. Factor analysis performed to examine the existence of relationship between study variables and consumer acceptance of new seaweed based functional foods indicated scores above 0.6 for each of dimensions tested. The study pointed out that marketing strategy should concentrate on consumer's focus on health, purchase habits, interest in novel products and knowledge of functional foods in general and seaweed products in particular. Popularization efforts through exhibitions and news coverage will widen the consumer base for the seaweed products. Consumer segmentation performed using cluster analysis revealed that, although Kerala consumers were divided on the acceptance of seaweed products, they have exhibited perception of linking their diet with health which can be useful in promoting demand for these food products. Segmentation analysis underscores existence of consumer groups characterized by distinct outlook towards food products with seaweed as functional ingredients. The results of this study highlights that immense opportunities exists for establishment of seaweed based small scale food processing industry.

Vaidhyanathan Geethalakshmi, Amulya Kumar Mohanty and Suseela

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