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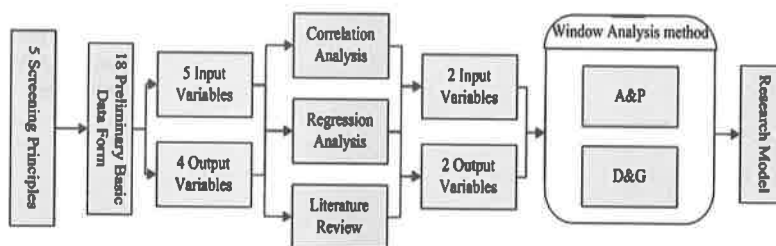
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Management & Information Technology

- 437 **Innovation Management and Strategy**
A J Briones Peñalver, José António C Santos, J A Bernal Conesa & M C Santos
This paper studies the capacities related with innovation, technological development, the role of the innovation systems and the institutional aspects on the strategy of companies related to the Spanish defence industry. The empirical part of the study is based on a survey to 236 small and medium-sized companies, which represent 52% of that universe. Concerning the innovation strategy, it defines the most important factors of the technological innovation processes and analyses the causal relationship between strategy and structure, the role of innovation in cooperation, intercompany relationships and the dependence relationship in technological innovation capacities.
- 442 **The Effects of Environmental Regulation and Financial Constraints on Corporate R&D Investment in China**
Hang Li, Feng He, Yanmin Shao & Lili Chen
Based on a panel dataset of non-financial listed firms during 2007–2014 in China, we examine both independent and combined effects of environmental regulations and financial constraints on corporate R&D investment. In addition, we uncover the underlying mechanism of how both indicators affect R&D investment through three financing sources. The results show that: (1) Environmental regulations can significantly promote R&D investment, while financial constraints have the opposite effects. (2) Among the three financing sources, environmental regulations promote R&D investment only by internal financing, while financial constraints inhibit R&D investment by all three financing sources.
- 447 **Measuring Dynamic Operation Efficiency for Universal Top 10 TFT-LCDs by Improved Data Envelopment Analysis**
Z Y Lee, Grace T R Lin & S J Lee
Currently the major manufacturers of TFT-LCD (Thin Film Transistor-Liquid Crystal Display) in South Korea, Taiwan and Japan, and contribute 80% sales in global market. In view of the rapid growth of global demand, TFT-LCD manufacturers face tremendous competition. In this context, how to configure the best resource allocation and create more profit tend to be the major issue. In this study, the TFT-LCD firms in China, Korea and Japan is analyzed. Based on the trend analysis by Industrial Technology Research Institute in Taiwan, public database and information, financial statements and annual reports of these firms, we use improved Data Envelopment Analysis (DEA) in association with Window Analysis to measure their dynamic operating performance in China, Korea and Japan.

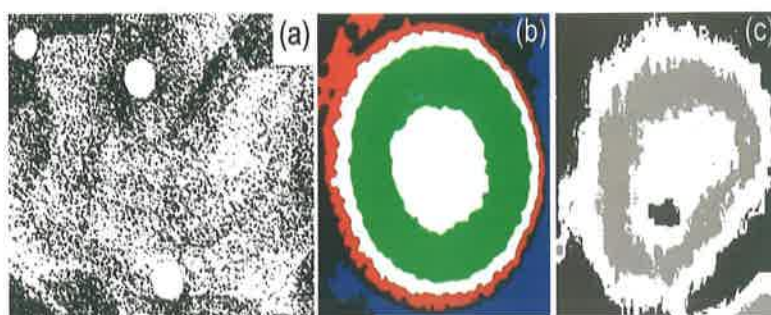


Z Y Lee, Grace T R Lin & S J Lee

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451 **Automatic Colony Segmentation on Agar Surface by Image Processing**

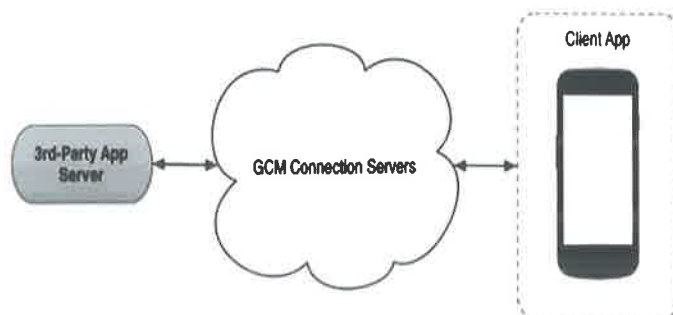
The Medium (Petri dish, media, agar plate, petri culture, agar culture) are environments that have been formulated for the growth of microorganisms. These structures which are formed by reproduced microorganisms and can be seen by eye are called colony. Colonies formed on the agar, creating images of different morphological characteristics depending on the microorganism and growth media. Colony counting which is required in many applications in areas such as biotechnology and pathology is boring, time consuming and prone to human error process when the large number of colonies counted by hand. In this article, the sample images collected from dairies in the Marmara region are studied on and segmentation methods for separating images of microorganism colonies which is used in the dairy industry for the determination of microbiological analysis of products, have been investigated by the computer-aided image processing techniques such as Otsu, Multi-Otsu, Color K-Means, Watershed, Gabor Filters, Graph Based, Lossy Compression, Random Walker, Texture Filters with proposed comparison method. It was concluded that existing segmentation methods with appropriate parameters can be used to solve this problem and in comparison to other algorithms, Watershed segmentation algorithm has better performance values than others.



Volkan Altuntaş, Seda Altuntaş & Murat Gök

457 **Suspicious Motion Detection and Tracking Based On Histogram**

Video surveillance systems are becoming important for crime investigation and the number of cameras installed in public space is increasing. Detection of suspicious human behavior is of great practical importance. Due to irregular nature of human movements, reliable classification of distrustful human movements can be very difficult. Defining a way to the problem of automatically track down the people and detecting unusual or distrustful movements in Closed Circuit TV (CCTV) videos is our primary aim. We are proposing a system that works for close observation systems installed in indoor environments like entrances/exits of buildings, corridors, etc. Our work presents a structure that processes video data obtained from a CCTV camera fixed at a particular location. The development of an Android application which interprets the message a mobile device receives on possible interruption and subsequently a reply (Short Message Service) SMS which prompt an alarm/buzzer in the remote house making others aware of the possible interruption. Using threshold value the detected pixel is recognized. Hence the movement of the object is identified exactly. After motion detection it will send GCM alert to the android mobile application.

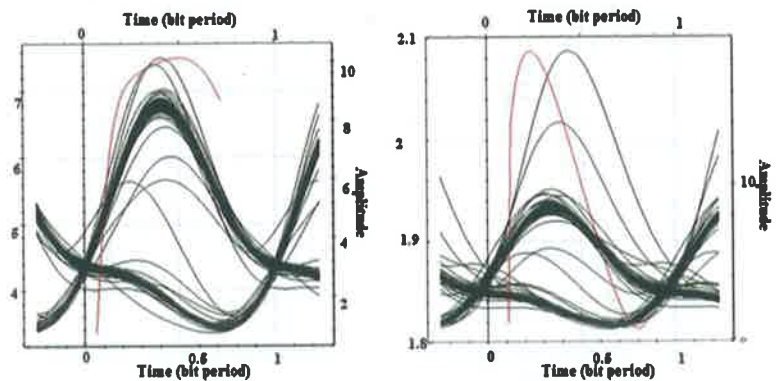


A Nirmal Kumar, D Daya Florance & A Jayanthi

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S & T and Industrial Research

- 461 Achievement of Long Reach High Speed WDM-to-OTDM Conversion Based on XPM (Cross Phase Modulation)** Wavelength division multiplexing is solution for high speed data over communication channels and utilizes bandwidth of optical fiber. Based on 2 km HNLF (Highly Non-Linear Fiber), a simple and strong demultiplexer employing SPM (Self Phase Modulation) introduced SC (Super continuum) generation and optical filtering has been effectively used in the demultiplexing of 80-Gb/s data to 20 Gb/s. The Q (Quality) factor value decreases as the transmission distance increases. At 0 dBm input power the Q factor value is 5.766772 with BER(Bit Error Rate) 3.95065×10^{-9} that have maximum achievable distance of 98 km. As the transmission distance increases the effect of the noise on the system become more critical is demonstrated in eye diagrams. In the range of line width 0 MHz to 100 MHz the 10 MHz gives the best performance in term of BER and Q factor value. Also results at 80 Gbps over 100Km are realized after using symmetrical dispersion compensation and cascaded EAM (Electro absorption modulation) detection.

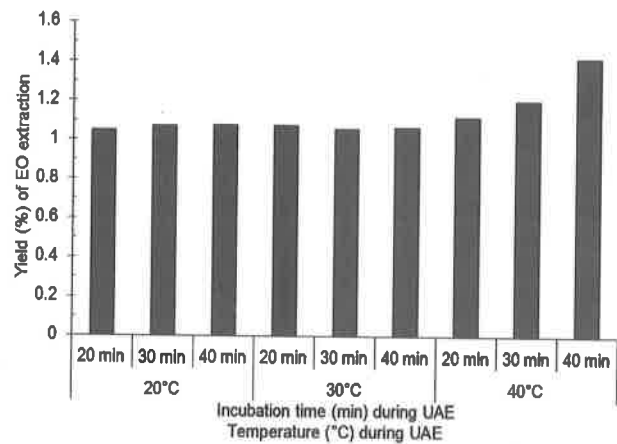


H Rana, S Bakshi & A Gupta

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465 Coupling Ultrasound with Enzyme-Assisted Extraction of Essential Oil from Algerian *Artemisia herba-alba* Asso

The composition of the essential oil (EO) of *Artemisia herba-alba* Asso, extracted by Hydro-Distillation (HD) and by coupling Ultrasound with Enzyme-Assisted Extraction (UE-AE) prior to HD from the plant's aerial parts were analyzed by GC-MS. Antibacterial, antifungal and antioxidant activities of the obtained EOs were evaluated. The yield of EO extraction after pretreatment of the desert wormwood leaves by coupling ultrasound with enzymes was in the range of $1.56\% \pm 0.07$ compared to $1.01\% \pm 0.08$ in HD process; also, the total time necessary to complete EO extraction is 180min for HD and 120min for UE-AE. GC-MS profiling of the EOs showed changes in chemotype obtained by HD from camphor/1,8-cineole/ α -thujone/chrysanthenone to a new chemotype in the case of UE-AE: camphor/ α -thujone/1,8-cineole/filifolone; Then, an increasing of filifolone, α -thujone, 3-octyne and cis-limonene oxide characterize the UE-EO. The antifungal activity of the EO has slightly increased when extracted by UE-AE, however, both antibacterial and antioxidant activities were interestingly increased.

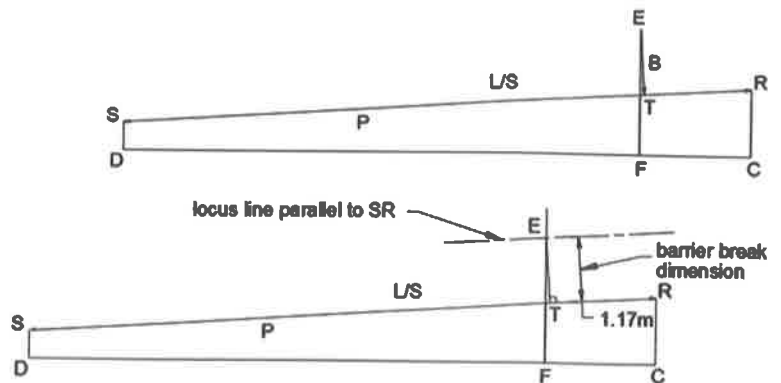


F Agouillal, H Moghrani, N Nasrallah, Z Hanapi, Z Mat Taher & H A El-Enshasy

Energy and Environment

472 Noise Barriers as an Abatement Strategy

An attempt has been made in the present work to propose a systematic design methodology for the acoustic design of noise barriers. The nomograph method for the design of the noise barrier is presented. The methodology has been applied on a site in an urban area of Patiala city. A noise reduction of 8.5 dB(A) can be achieved by the installation of the noise barrier. The height of the barrier calculated with the nomograph method has also been verified by using the Fresnel number approach and empirical charts. The proposed methodology can be used for the systematic design of noise barriers with acoustic considerations.

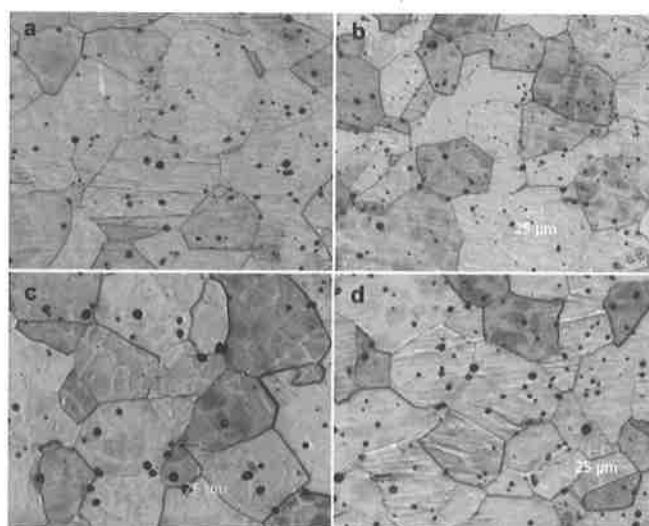


Daljeet Singh, S P Nigam, VP Agrawal & Maneek Kumar

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Short Communication**478 Experimental Studies on Vataharanaloha -
an Ancient Aircraft Material**

This paper reports the preparation and characterization of an ancient aircraft material Vataharanaloha, described in the ancient Sanskrit scientific treatise 'Bharadwaja's Vymanika Sastra'. The material deciphered as a copper-iron alloy was fabricated by ancient liquid metallurgy technique. The density, tensile strength, hardness and electrical conductivity of the alloy (before and after heat treatments) were validated with the descriptions in the text of applicability for exhaust pipes in an ancient aircraft. The alloy specimens showed microporosity to some extent and thus made the material lighter than expected with a reduction of 10 % than the theoretical density. The cast specimens exhibited moderate tensile strength and hardness. Electrical conductivity was more than twice the initial value, after heat treatment in all the specimens.



**Padmashree Anand, Mohan C B &
Gopalakrishna K**

Author-Reader Platform**481 Instructions to contributors (Extended)**

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