

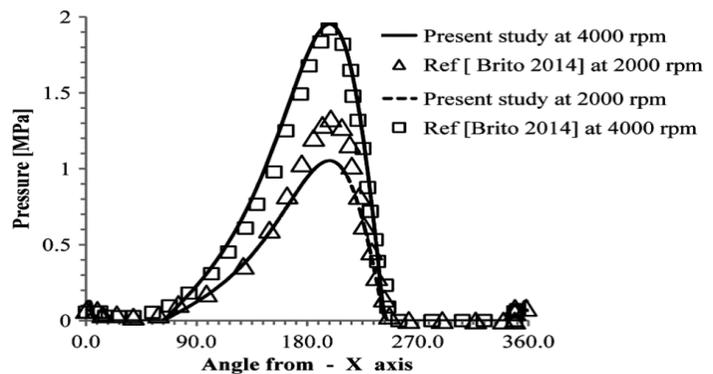
CONTENTS

Mechanical Engineering

1049 Effect of Groove Location on Pressure Profile of Twin Axial Groove Journal Bearing

The main aim of current work is to analyze the influence of groove location on the pressure profile of the hybrid journal bearing. The objective is to develop solution algorithm and computer program which will provide pressure profile developed in the space of clearance of bearing having a given value of Sommerfeld number. The solution algorithm shall also provide three dimensional pressure profiles of the bearing for different groove location. It was found that groove location with respect to the loading line strongly influences the parameters of performance because of the stronger groove interference in the pressurized hydrodynamic field.

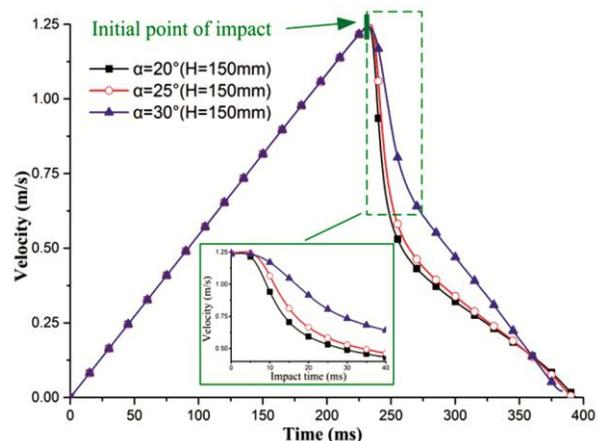
Vijay Kumar Dwivedi, Pooja Pathak, Kamal Sharma & Manish Saraswat



1053 CFD-Based Analysis of Wedges Water Entry under Impact Loads

The impact on a falling wedge upon water entry is numerically investigated in this paper. After verified by experimental data, the numerical framework is applied for parametric studies on wedges of different drop heights and different deadrise angles to reveal the interaction behaviour between the wedge and water during impact. Pressure distribution on the wedge surface during the water entry shows that the pressure peak moves up along the surface as impact time increases. It is found that the force peak decrease with the increase of drop height and decrease of deadrise angle of the wedge. The peak positions move positively along the timeline as the increase of deadrise angle while the peak force appears just in a small impact time range for a wedge.

Xujian Lyu, Dongdong Tang, Yanmin Guan & Jianglong Sun

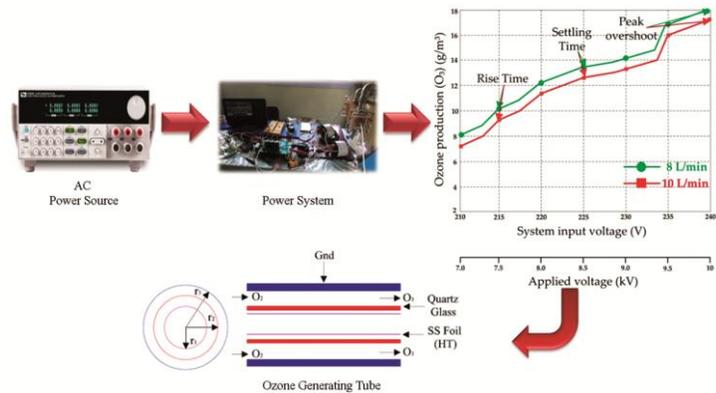


Electrical Engineering

1057 Design and Development of a Digital Controlled Dielectric Barrier Discharge (DBD) AC Power Supply for Ozone Generation

A digital controlled dielectric barrier discharge (DBD) AC (Alternative current) power supply is designed and investigated. The power source design with a diode bridge rectifier and PWM (Pulse Width Modulation) inverter along with driver circuits are presented. A step-up transformer is designed to carry 4.6 kW and 10 kVp-p for a dielectric barrier discharge (DBD) AC power supply and ozone generation. An STM (STMicroelectronics) microcontroller is employed to control the phase shift angle of the PWM inverter. The operating frequency of the PWM inverter is 25 kHz. Zero voltage detection can be reached and achieves maximum efficiency. Also, a high voltage transformer is included. The practical results shown that the DBD power supply can be controlled at the chosen value and extreme efficiency can be 87.45 % at 4.6 kW/10 kVp-p.

T N V Krishna, P Himasree, S Srinivasa Rao, Yedluri Anil Kumar, Naga Bhushanam Kundakar & Hee-Je Kim



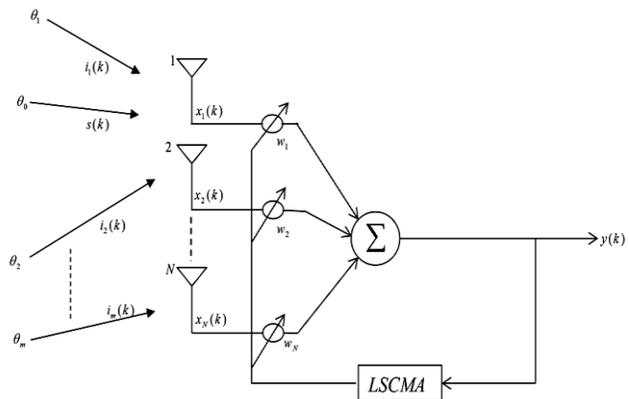
The DBD AC power supply achieves 87.45 % at 4.6 kW/10 kVp-p.

Electronics & Telecommunication

1069 An Efficient Source Localization Method in Presence of Multipath using Smart Antenna System

In this paper, a MATLAB based smart antenna testbed that efficiently localizes the line-of-sight (LOS) source in the presence of multipath signals is developed. By exploiting the consistent amplitude nature of the LOS signal, a variant of Constant Modulus Algorithm, namely Multitarget-Least Square Constant Modulus Algorithm is employed to adapt and update the weights of the smart antenna for estimation of the direction-of-arrival (DOA) of the LOS and multipath interference signals. Performance is compared with the conventional and recently proposed algorithms in the same testbed with alike considerations. Simulation result shows that the proposed method of DOA estimation performs better in terms of probability of resolution and root mean square error.

Saurav Ganguly, Jayanta Ghosh, Puli Kishore Kumar & Mainak Mukhopadhyay

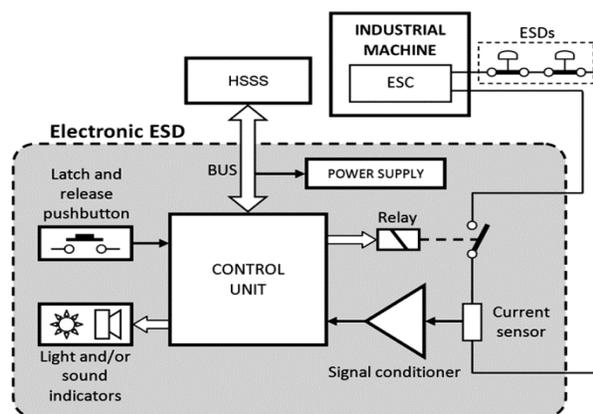


CONTENTS

1074 Practical Design of Electronic Emergency Stop Devices for Machine Safety

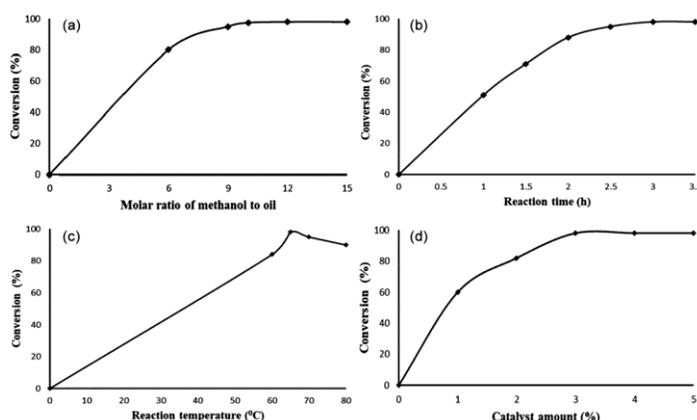
A variety of safety protective devices (SPDs) are currently available on the machinery safety market. SPD complexity and cost depend on the safety feature implemented as required for a specific piece of machinery in its working environment. However, one type of inexpensive SPD is mandatory for many types of machines: the emergency stop device (ESD). This paper introduces a novel ESD recently developed by the authors. This electronic ESD is capable of automatically performing emergency stop actions as commanded by a suitable external supervisory safety system connected to it, which may replace or reinforce the human action expected for the provision of safety. In addition, the device allows integration with any emergency stop circuit already designed for machinery by means of configurable features. Both practical design and implementation issues are discussed in detail through a fully exemplified concept-design-prototype-validation procedure.

J Alvaro Fernandez-Muñoz, J Ignacio Suarez-Marcelo & M Dolores Moreno-Rabe


Energy Technology & Management
1080 Transesterification of *Jatropha curcas* Oil by using K Impregnated CaO Heterogeneous Catalyst

Growing environmental concern and fast depletion of conventional fossil fuel resources have induced an urgent search for alternative energy sources. In this regard, biodiesel obtained from *Jatropha* oil (a non-food oil), seems to be a very promising alternative. Though a lot of research is already done in catalytic transesterification, in the present work, conversion of high FFA (5.5%) bearing *Jatropha* oil to methyl ester was studied using synthesized KF/CaO solid catalyst. The novelty of this heterogeneous catalyst is the omission of two major steps — neutralization step in which acid is used followed by transesterification using the basic homogeneous catalyst. The catalyst KF/CaO is easily prepared from cheap chemicals and is safe for the environment.

Gajanan Sahu, Sujan Saha, Y S C Khuman, Sudipta Datta1 & Prakash D Chavan

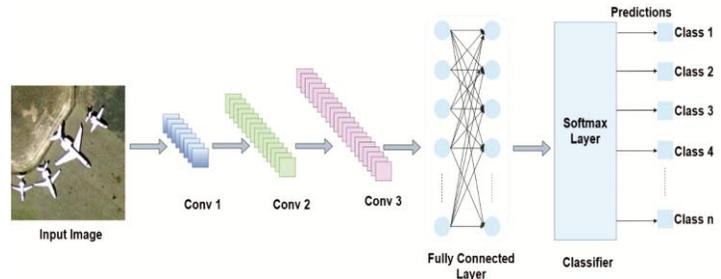


Computer Science & Information Technology

1087 Scene based Classification of Aerial Images using Convolution Neural Networks

The advent of computer vision and evolution of high-end computing in remote sensing images have embellish various researchers for unprecedented development in remotely sensed aerial images. The requirement to extract essential information stimulated anatomization of aerial images for its usefulness. Deep learning provides state of the art solutions for widely explored visual recognition system and has emerged as an evolutionary area, being applicable to large scale image processing applications. Convolutional Neural Networks (CNNs), an essential component of deep learning algorithms consists of increasing the depth and connections in the processing layers to learn various features of data at different abstract levels. . In this paper, we present an outlook for classifying and extracting the features of aerial images using CNN. We propose a CNN architecture based on various parameters and layers for classification. CNN has been evaluated on two publicly available aerial data sets: UCMerced Land Use and RSSCN7. Experimental results show that the proposed CNN architecture is competent and efficient in terms of accuracy as performance evaluation parameter in comparison with conventional classifiers like Bag of Visual Words (BOVW).

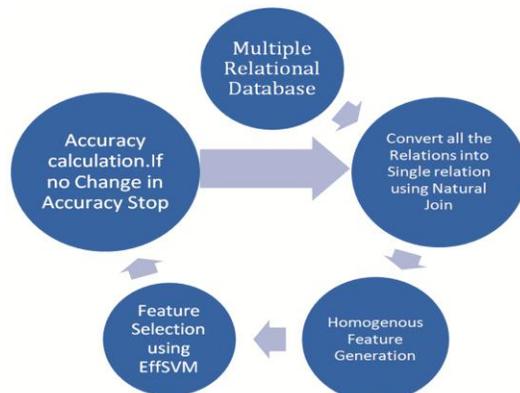
Palak Mahajan, Pawanesh Abrol & Parveen K Lehana



1095 A New Improved Approach for Feature Generation and Selection in Multi-Relational Statistical Modelling using ML

Multi-relational classification is highly challengeable task in data mining, because so much data in our world is organised in multiple relations. The challenge comes from the huge collection of search spaces and high calculation cost arises in the selection of feature due to excessive complexity in the various relations. The state-of-the-art approach is based on clusters and inductive logical programming to retrieve important features and derived hypothesis. However, those techniques are very slow and unable to create enough data and information to produce efficient classifiers. In the given paper, we proposed a fast and effective method for the feature selection using multi-relational classification. Moreover we introduced the natural join and SVM based feature selection in multi-relation statistical learning. The performance of our model on various datasets indicates that our model is efficient, reliable and highly accurate.

Vikash Yadav, Mayur Rahul & Rati Shukla



CONTENTS

1101 Identification of Real-Time Maglev Plant using Long-Short Term Memory Network based Deep Learning Technique	<p>Deep neural network has emerged as one of the most effective networks for modeling of highly non-linear complex real-time systems. The long-short term memory network (LSTM) which is a one of the variants of recurrent neural network (RNN) has been proposed for the identification of a highly nonlinear Maglev plant. The comparative analysis of its performance is carried out with the functional link artificial neural network- least mean square (FLANN-LMS), FLANN-particle swarm optimization (FLANN-PSO), FLANN-teaching learning based optimization (FLANN-TLBO) and FLANN-black widow optimization (FLANN-BWO) algorithm. The proposed LSTM model is a feed forward neural network trained by a simple iterative method called the ADAM algorithm.</p>
<p>Amit Kumar Sahoo, Rudra Narayan Pandey, Sudhansu Kumar Mishra & Prajna Parimita Dash</p>	<p>The diagram illustrates the internal structure of an LSTM cell. It shows three main components: the Forget Gate (top), the Input Gate (middle), and the Output Gate (bottom). The cell takes an input x_t and the previous hidden state h_{t-1} as input. The Forget Gate outputs a value that is multiplied with the previous cell state. The Input Gate outputs a value that is multiplied with the candidate cell state. The Output Gate outputs a value that is multiplied with the cell state to produce the next hidden state h_t. The cell state is updated through these operations.</p>
1106 Performance Evaluation of the Cloud-based QR Code Identity Tag System with Cloudlets	<p>In this paper, a QR Code Identity Tag System designed for Turkish healthcare and served through the cloud is presented. The system designed is a distributed information management system as the medical data objects are geographically distributed over the system. The data objects are geographically distributed as they are placed on servers closest to the geographical location where they are most frequently required. This enables that the data is always available and the access is provided in minimum time. Additionally, to improve the performance the system employs Mobile Edge Computing technology in the form of cloudlets. The simulation results show that system performance improves as the number of cloudlets used increases and popularity threshold decreases.</p>
<p>Vassilya Uzun</p>	

R&D Management

1110 The Influence of Aging on Technological Innovation : Empirical Evidence from China	<p>Using panel data from 30 Chinese provinces for the period between 2003 and 2017, this paper explores the relationship between the aging and technological innovation. The global principal components analysis is used to construct the index system of technological innovation from three aspects: innovation input, innovation output and innovation diffusion. Then, the inverted U-shape relationship between population aging and technological innovation is obtained from the dynamic perspective by using two-step system generalized method of moments (SYS-GMM). The influence of population aging on technological innovation is firstly promoted and then suppressed. In addition, the degree of opening up, the level of economic development, the construction of network infrastructure and human capital all have positive impact on technological innovation.</p>
<p>Yuqing Zhu</p>	

Author-Reader Platform

1116 Annual Author Index	
1120 Annual Keyword Index	
1125 List of Experts	
1126 Instructions to Contributors	

CONTENTS

Author Index

Chavan P D	1080	Moreno-Rabel M D	1074
Dash P P	1101	Mukhopadhyay M	1069
Datta S	1080	Pandey R N	1101
Dwivedi V K	1049	Parveen K L	1087
Fernandez-Muñoz J A	1074	Pathak P	1049
Ganguly S	1069	Pawanesh A	1087
Ghosh J	1069	Rao S S	1057
Guan Y	1053	Saha S	1080
Hee-Je Kim	1057	Sahoo A K	1101
Himasree P	1057	Sahu G	1080
Khuman Y S C	1080	Saraswat M	1049
Krishna T N V	1057	Sharma K	1049
Kumar P K	1069	Shukla R	1095
Kumar Y A	1057	Suarez-Marcelo J I	1074
Kundakarla N B	1057	Sun J	1053
Lyu X	1053	Tang D	1053
Mahajan P	1087	Uzun V	1106
Mayur R	1095	Yadav V	1095
Mishra S K	1101	Zhu Y Q	1110

Keyword Index

Aging	1110	LOS	1069
Array processing	1069	LS-CMA	1069
Biodiesel	1080	Machinery safety	1074
CaO supported KF catalyst	1080	Maglev system	1101
CFD	1053	Mean Square Error	1101
Cloud computing	1106	Multipath transmission	1069
Cloudlets	1106	Natural Join	1095
CNN	1087	Non-edible oil	1080
Control circuit	1057	Object retrieval	1106
Deep learning	1087	Optimization	1080
Diode bridge rectifier	1057	Personal Health Records	1106
DOA estimation	1069	Pressure profile	1049
E-health, Mobile Edge Computing	1106	Prototyping	1074
Electronic design	1074	PWM inverter	1057
Emergency stop device	1074	Recurrent Neural Network	1101
Feature extraction	1087	Smart antennas	1069
Feature Selection	1095	Somerfeld Number	1049
FFA	1080	Statistical Learning	1095
FLANN	1101	STM	1057
Free surface	1053	Super laminar flow	1049
Groove	1049	SVM	1095
High voltage transformer	1057	System GMM	1110
Hybrid journal bearing	1049	System identification	1101
Image classification	1087	Technological innovation	1110
Impact	1053	VOF	1053
Inductive Logical Programming	1095	Wedge	1053
Inverted U-shape	1110		