Scopus

Documents

1) Bagavathi, C., Saraniya, O.

Enhanced texture classification through feature compaction using dihybrid bio-inspired computation techniques
(2021) *Concurrency and Computation: Practice and Experience*, 33 (24), art. no. e6453, .

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Department of ECE, Government College of Technology, Coimbatore, 641013, India

Abstract
Synchronous data processing is often preferred considering the volume of data available and the requirement of processed data. Data volume increase from current technical advancements should be balanced and suitably dealt with efficient feature processing techniques. Feature selection can efficiently improve the concurrency in data processing on a completely uncorrelated and separately processable feature set. Texture analysis is a significant application of image processing that analyses specific patterns in an image. As the volume of image data available for producing better classification models progressively moves to be out of the human-manageable range, it is the automation methods that aid the researchers to manage the data. When the number of samples in the data and the dimensionality of the problem is too high, the purpose of data analysis is often compromised. Feature engineering can be utilized to improve the efficiency of the model with a smaller subset of features. This work proposes dibyhrid bio-inspired computation based feature compaction, that is a combination of improvised genetic algorithm and selective tabu search for texture classification problem. Machine learning techniques are employed to evaluate and minimize the validation error from the applied computational methods. © 2021 John Wiley & Sons, Ltd.

Author Keywords
bio-inspired methodologies; feature selection; hybrid optimization; parallel computation; texture analysis

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2) Velusamy, K.[a] , Devanand, J.[b] , Senthil Kumar, P.[c] , Soundarajan, K.[d] , Sivasubramanian, V.[e] , Sindhu, J.[a] , Vo, D.-V.N.[f]

A review on nano-catalysts and biochar-based catalysts for biofuel production
(2021) *Fuel*, 306, art. no. 121632, . Cited 57 times.

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[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, 641013, India
[b] Department of Mechanical Engineering, Government Polytechnic College, Coimbatore, 641014, India
[c] Department of Chemical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Chennai, 603 110, India
[d] Department of Electronics and Communication Engineering, Government Polytechnic College, Coimbatore, 641014, India
[e] Department of Mechanical Engineering, Government Polytechnic College for Women, Coimbatore, 641044, India
[f] Center of Excellence for Green Energy and Environmental Nanomaterials (CE@GrEEN), Nguyen Tat Thanh University, Ho Chi Minh City, Viet Nam

Abstract
Necessity and exploitation of fossil fuels is unstoppable in meeting humanity's needs despite being a small and scarce

resource. The use of different renewable feedstock materials are vital in the satisfaction of large-scale demand for renewable energy sources without creating environmental problems in order to satisfy energy demand. In this context we covered the production of biofuels from a variety of feedstocks using pyrolysis, direct blending, micro-emulsion, trans-esterification (biodiesel production techniques) and hydrolysis, acidogenesis, acetogenesis, methanogenesis (biogas production techniques) and pyrolysis, thermochemical liquefaction (bio-oil production techniques) along with the focus on increasing biofuel production using nanocatalysts and biochar-based catalysts and the techniques for creating those catalysts. Torrefaction, pyrolysis, hydrothermal carbonization, hydrothermal liquefaction, and gasification are the key methods used to make biochar. Slow pyrolysis and hydrothermal carbonisation are the best methods to produce high-yield biochar. Biochar's catalytic activity is influenced by pyrolysis temperature, pyrolysis time, transition metals, and biomass to water mass ratio. However, there are some noteworthy challenges associated with biofuel development. The cost of feedstock and the option of convenient technology for efficient fuel production, the availability of commercially viable nanoparticles, a biological understanding of the nanomaterial and protein system, and microorganism compatibility levels involving enzymes and nanomaterials are all discussed repeatedly. © 2021 Elsevier Ltd

Author Keywords
Biofuels; Heterogeneous catalysts; Homogeneous catalysts; Nanocatalysts; Renewable energy; Synthesis techniques

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3) Jambulingam, K., Sathya, A., Sharvika, T.

Bioethanol production from pineapple peels waste by heat treatment and enzyme hydrolysis: An eco-friendly and economical method
(2021) *Research Journal of Biotechnology*, 16 (12), pp. 64-71.

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Government college of Technology, Coimbatore-13, Tamilnadu, India

Abstract
Bioethanol is a renewable energy source with reduced CO2 emission and a better alternate for fossil fuels. The production of bioethanol using low cost agricultural wastes such as fruits waste always remains a better solution for the present environmental and energy problems. The present study focusses on the production of bioethanol from pineapple peel wastes by simultaneous scarification and fermentation process in a completely eco-friendly manner and economical manner. The fruit wastes are rich sources of sugars and can be utilized for the production of second generation fuel. Initially, cellulase producing potent bacterial isolate was isolated from soil sample collected from fruit market (Uzhavar Santhai), R.S. Puram, Coimbatore district, Tamilnadu, India. Further, the bacterial isolate was identified by 16S rDNA sequencing and the sequence was submitted in GenBank with the accession number MW227436. The phylogenetic tree was constructed and the bacterial isolate was identified as Bacillus cereus strain JK79. Pineapple peel waste was processed, heat pretreated and was utilized for enzymatic saccharification with crude cellulase enzyme to hydrolyze cellulose into simple sugars. The enzyme hydrolyzed content was allowed to undergo fermentation simultaneously (Simultaneous saccharification and fermentation) utilizing Saccharomyces cerevisiae to produce bioethanol. The yield of bioethanol was determined by potassium dichromate method. About 10.07 g/l of bioethanol was obtained by fermenting the enzymatically hydrolyzed pineapple peel waste using Saccharomyces cerevisiae. The production of bioethanol was confirmed by GC-MS.

Author Keywords
16S rDNA sequencing; Bacillus cereus JK79; Bioethanol; Cellulase; Cellulase hydrolysis; GC-MS; Heat pretreatment; Isolation; Pineapple peel waste; Saccharomyces cerevisiae; Simultaneous saccharification and Fermentation

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4) Kumar, C.J.A.[a] , Gopi, S.[b] , Kumar, S.S.[c] , Mohan, D.G.[d]

Mechanical, metallurgical and tribological properties of friction stir processed aluminium alloy 6061 hybrid surface

composites
(2021) *Surface Topography: Metrology and Properties*, 9 (4), art. no. 045019, . Cited 15 times.

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[a] Department of Mechanical Engineering, CIT Sandwich Polytechnic College, Tamil Nadu, Coimbatore, 641014, India
[b] Department of Production Engineering, Government College of Technology, Tamil Nadu, Coimbatore, 641013, India
[c] Department of Metallurgical and Materials Engineering, Faculty of Engineering and Technology, Jain University, Karnataka, Bengaluru, India
[d] Institute of Materials Joining, Shandong University, Jinan, China

Abstract
Friction stir processing (FSP) was applied in the fabrication of aluminium hybrid surface composites by embedding reinforcement particles namely, aluminium oxide (Al2O3), boron nitride (BN) and Graphite (Gr) with Boron carbide (B4C) in an equal volume basis. Three FSPed plates were fabricated at constant tool rotational speed of 1000 rpm, welding speed of 30 mm min−1 and axial force of 6 kN. The microstructure showed the homogeneous dispersion of reinforcement particles and good interfacial bonding between the reinforcement particles and the base material was observed in the processed zone. In terms of strength and hardness, surface composites with B4C and Al2O3 combinations yielded better mechanical properties over other the combinations. The results of wear studies reveal that the FSPed surfaces exhibited better resistance to wear when compared to the base material in a dry sliding condition. The dominance of abrasive wear was observed in all cases of the surface composites inspite of few micro cracks and delamination found on the worn surface. XRD analysis suggests that no secondary phases or intermetallic was formed anywhere in the processed zone. © 2021 IOP Publishing Ltd

Author Keywords
Aluminium alloys; Friction stir processing; Microhardness; SEM; Tribological

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5) Thirunavukkarasu, A.[a] , Nithya, R.[a] , Sivashankar, R.[b]

Continuous fixed-bed biosorption process: A review
(2021) *Chemical Engineering Journal Advances*, 8, art. no. 100188, . Cited 42 times.

DOI: 10.1016/j.ceja.2021.100188

[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, 641013, India
[b] Department of Chemical Engineering, Hindustan Institute of Technology and Science, Chennai, 603103, India

Abstract
Biosorption is one of the solute enrichment techniques driven by the concentration difference of biosorbate molecules among the bulk liquid phase and solid biosorbent. The presence of the surface functional groups of the biosorbents facilitates the formation of physical/chemical interactions with the biosorbates at the solid-liquid interface. Biosorption is proved as an alternative, effective and sustainable approach to traditional water treatment technologies. Abundance, biodegradable, versatile surface functionalities, and ease of tailor-made modifications of biosorbents have fascinated many researchers to exploit their potential in the removal of a wide range of pollutants in batch/continuous mode of operation. However, the reports on continuous biosorption are significantly lesser and hence, the present review is focused only on the fixed-bed biosorption and comprehensively discussed the vital shortcomings of the current biosorption research. Conclusively, this review recommends potential research hotspots for the scientific community to address the prevailing research gaps. © 2021 The Author(s)

Author Keywords
Biosorbents; Biosorption; Continuous fixed-bed biosorption; Wastewater treatment

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6) Veerasamy, V.[a] , Abdul Wahab, N.I.[a] , Ramachandran, R.[b] , Othman, M.L.[a] , Hizam, H.[a] , Devendran, V.S.[a] , Irudayaraj, A.X.R.[a] , Vinayagam, A.[c]

Recurrent network based power flow solution for voltage stability assessment and improvement with distributed energy sources
(2021) *Applied Energy*, 302, art. no. 117524, . Cited 19 times.

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[a] Advanced Lightning, Power and Energy Research (ALPER), Department of Electrical and Electronics Engineering, Faculty of Engineering, Universiti Putra Malaysia (UPM), UPM Serdang, Selangor 43400, Malaysia
[b] Department of Electrical Engineering, Government College of Technology, Coimbatore, 641013, India
[c] Department of Electrical and Electronics Engineering, New Horizon College of Engineering, Bangalore, India

Abstract
The increasing penetration of alternative energy sources into the integrated energy systems often influences the voltage stability (VS) of the entire system. However, developing a technique that comprehensively analyze the energy flow in this environment is a major challenge. This paper presents a novel heuristic-based recurrent type Hopfield Neural Network (h-HNN) planning tool for VS assessment of power system; towards reducing the computational cost of conventional power flow (PF) method. The proposed approach is a Jacobian-less, energy function-based approach, which was formulated using power residuals of the system. The dynamics of neural networks were governed by the differential equations of energy function, which would be minimized by the heuristic particle swarm optimization-gravitational search algorithm to deduce the unknown parameters of voltage magnitude and phase angle. The proposed technique was coded in MATLAB and its effectiveness was tested on IEEE 14-, 30-, and 57- buses, as well as a 1354-bus test system. The obtained results were compared with well-known PF techniques, and the robustness was demonstrated for ill-conditioned network. A composite severity index was proposed to rank the critical contingency of the energy network. Then, the VS assessment was performed in IEEE 14-bus system under severe contingency conditions and improvement of VS is observed under the penetration of distributed energy sources (DES). During the case of DES placement, (i) the voltage profile of the system is maintained within the acceptable range of 0.95 to 1.05 pu and (ii) the VS of the system evaluated using stability indices are enhanced by an amount of 16.54 % to 88.16 %. The application results indicate that the proposed method is useful for electric energy utilities to assess the state of the system under monitoring process. © 2021 Elsevier Ltd

Author Keywords
Contingency ranking; Distributed energy sources; Heuristic-based Hopfield neural network; Power flow analysis; Voltage stability analysis

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7) Subramanian, K.[a] , Murugesan, S.[b] , Mohan, D.G.[c] , Tomków, J.[d]

Study on dry sliding wear and friction behaviour of al7068/si3n4/bn hybrid composites
(2021) *Materials*, 14 (21), art. no. 6560, . Cited 16 times.

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[a] Department of Production Engineering, Government College of Technology, Coimbatore, 641013, India
[b] Department of Mechanical Engineering, Anna University Regional Campus Coimbatore, Coimbatore, 641047, India
[c] Institute of Materials Joining, Shandong University, Jinan, 250061, China
[d] Faculty of Mechanical Engineering and Ship Technology, Gdańsk University of Technology, Gdańsk, 80-233, Poland

Abstract
Hybrid aluminium metal matrix composites have the potential to replace single reinforced aluminium metal matrix composites due to improved properties. Moreover, tribological performance is critical for these composites, as they have extensive application areas, such as the automotive, aerospace, marine and defence industries. The present work aims to establish the tribological characteristics of Al7068/Si3N4/BN hybrid metal matrix composites prepared by stir casting route

and studied using a pin-on-disc apparatus under dry sliding conditions. The hybrid composite samples were prepared at various weight percentages (0, 5, 10) of Si3N4 and BN particles. To investigate the tribological performance of the prepared composites, the wear experiments were conducted by varying the load (20, 40 and 60 N), sliding velocity (1.5, 2.5 and 3.5 m/s) and sliding distance (500, 1000 and 1500 m). Wear experimental runs were carried out based on the plan of experiments proposed by Taguchi. The minimum wear rate was found with the composite material reinforced with 10 wt. % of Si3N4 and 5 wt. % of BN. Analysis of Variance (ANOVA) was employed to analyse the effect of process parameters on wear rate and coefficient of friction (COF). The ANOVA test revealed that the weight fraction of Si3N4 has more of a contribution percentage (36.60%) on wear rate, and load has more of a contribution percentage (29.73%) on COF. The worn-out surface of the wear test specimens was studied using its corresponding SEM micrograph and correlated with the dry sliding wear experiment results.

Author Keywords
ANOVA; Boron nitride; Dry sliding wear; Hybrid composites; Silicon nitride

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8) Ramasamy, S.[a] , Perumal, M.[b]

CNN-based deep learning technique for improved H7 TLI with grid-connected photovoltaic systems
(2021) *International Journal of Energy Research*, 45 (14), pp. 19851-19868. Cited 11 times.

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[a] Research Scholar, Electrical and Electronics Engineering, Government College of Technology, Coimbatore, India
[b] Department of Electrical and Electronics Engineering, Government College of Technology, Coimbatore, India

Abstract
In this article, a three-phase transformerless inverter (TLI) for a solar photovoltaic (PV) system connected to a high-power grid are proposed, which has advantages of better performance and lower cost. The primary concern about the TLI is fluctuations in the common-mode voltage, which impacts switching frequency leakage current and grid interface system. An improved H7 common-mode voltage (CMV) clamped TLI with discontinuous pulse width modulation (DPWM) is designed using a conventional neural network (CNN)-based deep learning approach. In this, a completely minimized leakage current is obtained to avoid CMV transients. The proposed PV-connected improved H7-TLI provides low-loss DC-side decoupling, which further reduces leakage current and isolation of the PV system during off-grid. In addition, the effects of several factors on CNN deep learning performance are explored, including training data size, image resolution, and network configuration. The proposed technique has the potential to be used in a test instrument for intelligent signal analysis or used in an artificial intelligence system. Switching loss is analyzed using proposed and existing H7 inverters under different load conditions. To verify the theoretical explanation, existing H7 inverters is analyzed by MATLAB/Simulink, and the outcomes are tested experimentally. The total harmonic distortion (THD) analysis of proposed and existing topology is analyzed and compared. The THD values of the existing and proposed topology are 3.74% and 3.23%, respectively.

Author Keywords
conventional neural network; discontinuous pulse width modulation; H7 inverter; PV system; transformerless inverter

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9) Saravanan, A.[a] , Kumar, P.S.[b c] , Nguyen Vo, D.-V.[d e] , Jayasree, R.[a] , Venkatakrishnan Hemavathy, R.R.[a] , Karthik, V.[f] , Karishma, S.[a] , Jeevanantham, S.[a] , Manivasagan, V.[g] , George, C.S.[b]

Surface improved agro-based material for the effective separation of toxic Ni(II) ions from aquatic environment
(2021) *Chemosphere*, 283, art. no. 131215, . Cited 9 times.

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[a] Department of Biotechnology, Rajalakshmi Engineering College, Chennai, India
[b] Department of Chemical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Chennai, 603110, India
[c] Centre of Excellence in Water Research (CEWAR), Sri Sivasubramaniya Nadar College of Engineering, Chennai, 603 110, India
[d] Institute of Environmental Sciences, Nguyen Tat Thanh University, Ho Chi Minh City, Viet Nam
[e] College of Medical and Health Science, Asia University, Taichung, Taiwan
[f] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, India
[g] Department of Biotechnology, Adhiyamaan College of Engineering, Hosur, India

Abstract
In this present study, a novel and low cost surface improved material was prepared from the farm waste material (Borassus flabellifer male inflorescence) and its surface was enhanced by the sulphuric acid treatment to intensify the Ni(II) ions adsorption. The adsorption individualities such as availability of functional groups, essential elements and the exterior side and structural properties of the material were assessed by the FT-IR, EDX, SEM and XRD investigation. The impact of varied adsorption influencing parameters on Ni(II) ions adsorption was studied and optimized as pH - 6.0, biosorbent dosage - 1.5 g/L, contact time - 60 min and temperature - 303 K via batch adsorption examination. Modeling examinations were carried with varied adsorption isotherm (Langmuir, Freundlich, Fritz-Schlunder and Temkin) and kinetic models (Pseudo-first order, Pseudo-second order and Elovich kinetics). Thermodynamic studies were carried out at varied Ni(II) ions concentrations (25 mg/L – 150 mg/L) and temperatures (303 K–333 K) to explain the nature of Ni(II) ions adsorption on Borassus flabellifer male inflorescence. The prepared material has shown the most suitable Ni(II) ions adsorption results for the Langmuir isotherm (R2 = 0.9808) and Pseudo-first order kinetic models (R2 = 0.9735 for 25 mg/L). Thereby, the modeling study revealed that the prepared material has received the Ni(II) ions adsorption capacity (qm) value of 20.31 mg/g and the Ni(II) ions adsorption was physisorption. Thermodynamic results demonstrated that the Ni(II) ions adsorption was immediate, exothermic and favorable at low temperature. © 2021 Elsevier Ltd

Author Keywords
Adsorption; Agrowaste biomass; Ni(II) ion; Pollution; Separation; Surface improvement

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10) Velusamy, K.[a] , Periyasamy, S.[b] , Kumar, P.S.[c d] , Jayaraj, T.[e] , Krishnasamy, R.[f] , Sindhu, J.[a] , Sneka, D.[a] , Subhashini, B.[a] , Vo, D.-V.N.[g h]

Analysis on the removal of emerging contaminant from aqueous solution using biochar derived from soap nut seeds
(2021) *Environmental Pollution*, 287, art. no. 117632, . Cited 65 times.

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[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, 641013, India
[b] Department of Chemical Engineering, School of Mechanical, Chemical and Materials Engineering, Adama Science and Technology University, Adama, 1888, Ethiopia
[c] Department of Chemical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Chennai, 603 110, India
[d] Centre of Excellence in Water Research (CEWAR), Sri Sivasubramaniya Nadar College of Engineering, Chennai, 603 110, India
[e] Centre for Nanotechnology, Mepco Schlenk Engineering College, Sivakasi, 626005, India
[f] Department of Textile Processing, GRG Polytechnic College, Coimbatore, 641 107, India
[g] Institute of Environmental Sciences, Nguyen Tat Thanh University, Ho Chi Minh City, Viet Nam
[h] College of Medical and Health Science, Asia University, Taichung, Taiwan

Abstract
For clearing pollutants and emerging contaminants like ciprofloxacin-500mg from wastewaters generated from pharmaceutical industries, soapnut seeds biochar was synthesized and used as an adsorbent for the effective removal process. Tubular furnace operated under nitrogen gas environment was used to synthesize biochar. The batch analysis

were carried out successfully to study the removal mechanism and the removal efficiency of the chosen pollutant. The soapnut seeds biochar showed excellent adsorption of ciprofloxacin at pH 6 and temperature 303 K when the dosage was 0.07 g. The Langmuir removal capacity of 33.44 mg/g was received and the Freundlich model provided the best-fits. The ciprofloxacin-500mg adsorption process correlated well with the pseudo-second-order kinetics equation, and the intraparticle diffusion mechanism mainly controlled the process. The characterization of biochar concluded that O–H groups, C[dbnd]O groups, COO−groups and C–F groups, and π-π interactions, pore-filling effect, and cation exchange interactions played a role in the adsorption process. Therefore, the findings of the present work revealed that soapnut seeds biochar would be an excellent low-cost adsorbent for the removal of ciprofloxacin-500mg from wastewater. © 2021 Elsevier Ltd

Author Keywords
Adsorption; Biochar; Ciprofloxacin; Soapnut seeds; Wastewater

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11) Narasimman, S.[a b] , Balakrishnan, L.[c] , Alex, Z.C.[a]

Clad-modified fiber optic sensor utilizing CdS nanoflower as cladding for the detection of ethanol
(2021) *Journal of Materials Science: Materials in Electronics*, 32 (19), pp. 23900-23910. Cited 5 times.

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[a] School of Electronics Engineering, VIT, Vellore, 632014, India
[b] Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor, 517127, India
[c] Department of Physics, Government College of Technology, Coimbatore, 641013, India

Abstract
Nowadays, sensing and detection of ethanol is paramount one for numerous applications including production of ethanol, fuel processing, chemical processing in industry, traffic management, food package testing for safety and medical applications. On the other hand, the rapid growth of nanotechnology paves the way to develop highly sensitive, portable and low-cost sensors with less power consumption. In line with this fact, a cladding modified fiber optic ethanol sensor using CdS nanoflower has been reported in the present study. CdS nanoflower was prepared by one step hydrothermal synthesis and subjected for various characterization techniques to investigate the material properties. The sensor probe was developed viz cladding modification technology followed by dip coating of CdS nanoflower over an unclad section of an optical fiber. The potency of CdS nanoflower has been probed for 0–300 ppm of acetone, ethanol, methanol and isopropanol at ambient environment. The sensing results demonstrates that the sensor coated with CdS nanoflower manifested better sensing performances towards ethanol (~ 4.6% at 300 ppm) with response/recovery of 90 s and 100 s than other gases. The unique sensing feature complied that CdS nanoflower is desirable candidate in effective quantification of ethanol. © 2021, The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature.

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12) Karthik, V.[a] , Selvakumar, P.[b] , Senthil Kumar, P.[c] , Vo, D.-V.N.[d] , Gokulakrishnan, M.[a] , Keerthana, P.[a] , Tamil Elakkiya, V.[e] , Rajeswari, R.[f]

Graphene-based materials for environmental applications: a review
(2021) *Environmental Chemistry Letters*, 19 (5), pp. 3631-3644. Cited 43 times.

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[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, 641013, India
[b] Department of Chemical Engineering, Adama Science and Technology University, Adama, 1888, Ethiopia

[c] Department of Chemical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Chennai, 603110, India
[d] Center of Excellence for Green Energy and Environmental Nanomaterials (CE@GrEEN), Nguyen Tat Thanh University, Ho Chi Minh City, Viet Nam
[e] Department of Biotechnology, Bharathidasan Institute of Technology, Anna University, Tiruchirappalli, 620024, India
[f] Department of Biotechnology, P.S.R.Engineering College, Sivakasi, 626140, India

Abstract
The recent discovery and synthesis of graphene materials have led to many applications in various fields such as medicine, energy and environment. Here, we review the synthesis, functionalization, properties and applications of graphene materials with focus on environmental applications such as detection and adsorption of pollutants, and photocatalysis. For instance, hybrid systems can detect pollutants at levels of 0.1 nM Pb2+, 5 nM Hg2+ and 0.3 μmol Cu2+ per L with a faster response time. Graphene-based materials have adsorption capacities ranging from 21 to 117.5 mg/g for metal ions, and from 1 to 827 mg/g for organic pollutants. Graphene oxide-based photocatalytic devices allow more than 95% of dye degradation. © 2021, The Author(s), under exclusive licence to Springer Nature Switzerland AG.

Author Keywords
Analysis; Functionalization; Graphene; Remediation; Synthesis; Toxic pollutant

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13) Somasekaran, B.[a] , Thirunarayanaswamy, A.[a] , Palanivel, I.[b]

Tribological performance of aluminium hybrid self-lubricating composites reinforced with green synthesized graphene
(2021) *Materials Research Express*, 8 (9), art. no. 096530, . Cited 3 times.

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[a] Department of Mechanical Engineering, Government College of Technology, Coimbatore, India
[b] Department of Production Engineering, Government College of Technology, Coimbatore, India

Abstract
In this contemporary research work, graphene nanosheets were synthesized by the green method using agricultural waste and characterized by FESEM, XRD and Raman spectroscopy. Vortex liquid metallurgy technique is used to fabricate AA7075 hybrid composites reinforced with graphene and hard ceramic. The samples were evaluated for tensile strength, hardness and tribological behaviour. The influencing wear parameters percentage of graphene reinforcement, load, sliding speed and sliding distance were varied three levels each. An empirical relationship was formulated using face-centred central composite design considering wear weight loss and coefficient of friction as output responses. The influencing parameters on the output responses were determined by employing analysis of variance and the objective is to find the optimal process parameters. Graphene enriched the mechanical and wear behaviour. The composite having a 0.5 reinforcement percentage of graphene exhibited higher hardness and higher tensile strength. The optimal combination of tribological parameters for minimum wear loss and friction coefficient was found for 0.5% of graphene reinforcement, 30 N load, 2.5 m s-1 sliding speed, 1000 m sliding distance. The worn surface was also analyzed using FESEM and inverted microscope images. © 2021 The Author(s). Published by IOP Publishing Ltd.

Author Keywords
characterization; grapheme; liquid metallurgy technique; response surface methodology; self-lubricating composites; tribology

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14) Balamurugan, M.[a] , Gopi, S.[b] , Mohan, D.G.[c]

Influence of tool pin profiles on the filler added friction stir spot welded dissimilar aluminium alloy joints

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[a] Department of Mechanical Engineering, Government College of Engineering, Tamilnadu, Bodinayakanur, India
[b] Department of Production Engineering, Government College of Technology, Tamilnadu, Coimbatore, India
[c] Institute of Materials Joining, Shandong University, Jinan, China

Abstract
Dissimilar metals are pretty challenging to attain enhanced mechanical properties in the conventional friction stir spot welding (FSSW) process. In this research, a new filler added friction stir spot welding (FAFSSW) process is adopted for welding dissimilar aluminium alloys of AA5052 with AA6061 by using five different tapered tool pins to enhance the mechanical and metallurgical properties of the joints. Magnesium (Mg) powder with 4.5 mg in volume fraction is considered filler material to fabricate the joints. Mechanical properties of the spot weldments like tensile shear strength test, microhardness test, and metallurgical characterizations like microstructure analysis were carried out for FAFSSW joints. The results show that a tool pin profile with 5 mm upper diameter, 2 mm lower diameter and a pin length of 1.2 mm produce a sound joint with 202.85 MPa tensile shear strength and 119.9 HV microhardness. The FAFSSW joint shows 34% higher strength than the normal FSSW joints. The microstructure analysis indicates that the Mg filler mixes well in the weld zone, and a fine grain structure is gained without any defects. © 2021 The Author(s). Published by IOP Publishing Ltd.

Author Keywords
filler addition; friction stir spot welding; microstructure; tensile shear strength test; tool pin profile

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15) Veerasamy, V.[a] , Abdul Wahab, N.I.[a] , Ramachandran, R.[b] , Kamel, S.[c] , Othman, M.L.[a] , Hizam, H.[a] , Farade, R.[a]

Power flow solution using a novel generalized linear Hopfield network based on Moore–Penrose pseudoinverse
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[a] Advanced Lightning, Power and Energy Research (ALPER), Department of Electrical and Electronics Engineering, Faculty of Engineering, Universiti Putra Malaysia (UPM), Serdang, Selangor 43400, Malaysia
[b] Department of Electrical Engineering, Government College of Technology, Coimbatore, 641013, India
[c] Department of Electrical and Electronics Engineering, Aswan University, Aswan, Egypt

Abstract
This paper proposes a novel generalized linear Hopfield neural network-based power flow analysis technique using Moore–Penrose Inverse (MPI) to solve the nonlinear power flow equations (PFEs). The Hopfield neural network (HNN) with linear activation function augmented by a feed forward layer is used to compute the MPI. In this work, the inverse of Jacobian matrix in solving the PFEs is determined by including feed forward network along with feedback network. The developed power flow technique is coded in MATLAB, and its effectiveness is tested on well-conditioned IEEE bus systems (9-bus, 14-bus, 30-bus, and 118-bus), naturally ill-conditioned systems (11-bus and 13-bus), and real-time Malaysian 87-bus system. The results of voltage magnitude and phase angle obtained are compared with standard Newton–Raphson method in case of well-conditioned system. Further, the sensitivity analysis of this approach is carried out against change in initial conditions, line outage, and increase in power generation to validate its robustness. The computational cost of convergence time is compared with well-known power flow techniques of Modified HNN, fourth-order Runge–Kutta (RK4), Iwamoto, and Euler method. The convergence of solution obtained from proposed technique is ensured by Lyapunov notion of stability. © 2021, The Author(s), under exclusive licence to Springer-Verlag London Ltd., part of Springer Nature.

Author Keywords
Generalized linear Hopfield neural network; Moore–Penrose Inverse; Power flow analysis; Well- and ill-conditioned power systems

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16) Jayalakshmi, R., Jeyanthi, J.

Spectroscopic investigation of carbon nanotube as nano-filler entrapped in chitosan hydrogel beads
(2021) *Journal of Molecular Structure*, 1237, art. no. 130386, . Cited 8 times.

DOI: 10.1016/j.molstruc.2021.130386

Department of Civil Engineering, Government College of Technology, Coimbatore, India

Abstract
The present work primarily contemplates the entrapment of carbon nanotubes (CNT) as nano-filler into chitosan hydrogel beads using the phase inversion method in order to improve thermal stability and chemical resistance. The structural, functional and thermal properties of carbon nanotube entrapped chitosan hydrogel beads (CNTCB) are explored. The XRD pattern and Raman measurements confirm the graphitic nature of the CNT and its structural changes in the case of CNTCB. The SEM, TEM and AFM measurements reveal the successful entrapment of CNT in chitosan hydrogel beads. The FTIR studies and TGA/DTA analysis further support its improved chemical resistance and enhanced thermal stability after the entrapment. © 2021 Elsevier B.V.

Author Keywords
AFM; Chitosan; CNT; Entrapment; Polymer; Raman spectra

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17) Mugilan, T.[a] , Aezhisai Vallavi, M.S.[a] , Santhosh, S.[a] , Sugumar, D.[b] , Ezhil Singh, S.C.[c]

Retraction: Machining of microholes in Ti-6Al-4V by hybrid micro-electrical discharge machining to improve process parameters and flushing properties (Bulletin of the Polish Academy of Sciences Technical Sciences (2020) 68:3 (565-573) DOI: 10.24425/bpasts.2020.133366)
(2021) *Bulletin of the Polish Academy of Sciences: Technical Sciences*, 69 (4), art. no. e00ret1, .

[a] Department of Mechanical Engineering, Government College of Technology, Tamil Nadu, Coimbatore, India
[b] Department of ECE, Karunya Institute of Technology and Sciences, Tamil Nadu, Coimbatore, India
[c] Department of Mechanical Engineering, Vimal Jyothi Engineering College, Kerala, Kannur, India

Abstract
Note: The authors request the retraction of the publication “Machining of microholes in Ti-6Al-4V by hybrid micro-electrical discharge machining to improve process parameters and flushing properties” because of an ethical conflict with other performers of research results described in the article. This article has been retracted by the publisher. Reasonable effort should be made to remove all past references to this paper. © 2021 The Author(s).

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18) Velusamy, K.[a] , Periyasamy, S.[b] , Kumar, P.S.[c] , Vo, D.-V.N.[d] , Sindhu, J.[a] , Sneka, D.[a] , Subhashini, B.[a]

Advanced techniques to remove phosphates and nitrates from waters: a review
(2021) *Environmental Chemistry Letters*, 19 (4), pp. 3165-3180. Cited 55 times.

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[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, 641013, India
[b] Department of Chemical Engineering, Adama Science and Technology University, Adama, 1888, Ethiopia

[c] Department of Chemical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Chennai, 603 110, India
[d] Center of Excellence for Green Energy and Environmental Nanomaterials (CE@GrEEN), Nguyen Tat Thanh University, Ho Chi Minh City, Viet Nam

Abstract
At high levels, phosphates and nitrates from mineral fertilizers and wastewaters are contaminating natural waters, leading, for example, to eutrophication and death of many living species. This requires remediation techniques such as physical, chemical, biological methods, and nano-techniques. For instance, microbes such as Bacillus subtilis, Pseudomonas, Achromobacter, Spirulina platensis and Chlorella vulgaris allow denitrification and can remove 55% of phosphates. Removal can be done also using adsorbents produced from wastes and bio-sorbents. Here we compare the methods to remove phosphates and nitrates in waters. © 2021, The Author(s), under exclusive licence to Springer Nature Switzerland AG.

Author Keywords
Environmental pollutants; Nitrates removal; Phosphates removal; Water system

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19) R, B.[a] , J, J.[a] , S, M.K.[b]

Visible light assisted degradation of Atenolol by Fe-TiO2: Synthesis, characterization, optimization and mechanism
(2021) *Optik*, 239, art. no. 166658, . Cited 11 times.

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[a] Department of Civil Engineering, Government College of Technology, Coimbatore, Tamilnadu 641013, India
[b] Environmental and Water Resources Engineering Division, Department of Civil Engineering, IIT Madras, Chennai, 600036, India

Abstract
Photo stimulation of Fe doped TiO2 (Fe-TiO2) under visible light irradiation (i.e. 300 W Halogen lamp) was employed for atenolol (ATL) removal from domestic wastewater effluent. As a first step, Fe nanoparticles (NPs) were synthesized using Acacia Catechu pods, doped with TiO2, characterized using UV–vis spectrometry, SEM, TEM, FT-IR, XRD and XPS, and subsequently, used for photo degradation experiments. The experimental variables, viz., initial contaminant concentration (10–50 mg/L), pH (6–12), photocatalyst concentration (500–2000 mg/L) and reaction time (30–180 min.) were optimized using response surface methodology (RSM). A positive correlation between catalyst dosage and ATL degradation was observed in RSM up to a catalyst dose of 1.25 g/L when pH was between 7 and 9. After 105 min, a maximum of 85 % ATL removal was achieved at pH 9, 1.25 g/L of Fe-TiO2 dosage at an initial ATL concentration of 10 mg/L. The obtained RSM model demonstrated a high correlation between experimental and predicted values of ATL removal (R2~0.95). Cleavage of ether bond, hydroxylation of aromatic ring and oxidation of amine moieties were responsible for the degradation of ATL by visible light activated Fe-TiO2. The electrical energy consumed per order (EE/O) was evaluated to ascertain the efficiency of irradiation intensity and EE/O values were found to increase with increase in the initial ATL concentration. Overall, the green synthesized Fe-TiO2 could be an useful alternative for commercial photocatalysts. © 2021 Elsevier GmbH

Author Keywords
Advanced oxidation; Doped catalyst; Green synthesis; Pharmaceuticals; Photocatalysis; Wastewater treatment

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20) Ramasamy, B.[a] , Jeyadharmarajan, J.[a] , Chinnaiyan, P.[b]

Novel organic assisted Ag-ZnO photocatalyst for atenolol and acetaminophen photocatalytic degradation under visible radiation: performance and reaction mechanism
(2021) *Environmental Science and Pollution Research*, 28 (29), pp. 39637-39647. Cited 37 times.

DOI: 10.1007/s11356-021-13532-2

[a] Department of Civil Engineering, Government College of Technology, Coimbatore, Tamilnadu 641013, India
[b] Department of Civil Engineering, Amrita Vishwa Vidyapeetham, Coimbatore, India

Abstract
This study is on photocatalytic degradation of pharmaceutical residues of atenolol (ATL) and acetaminophen (ACT) present in secondary effluent under visible light irradiation stimulated by Ag doped ZnO (Ag-ZnO) photocatalyst. Lawsonia inermis leaf extract was used for reduction of Zinc sulphate to ZnO nanoparticles (NPs). Further, ZnO NPs were doped with Ag and characterized by XRD, FT-IR, SEM-EDX, surface area analyzer, UV-Vis, and photoluminescence spectrometry to analyze the structure, morphology, chemical composition, and optical property. FT-IR analysis revealed major functional groups such as OH, C=O, and SEM analysis depicted the polyhedron shape of the NPs with size range of 100 nm. Ag-ZnO NPs were used in the photocatalytic degradation of ATL and ACT, and its removal was evaluated by varying initial contaminant concentration, catalyst dosage, and initial pH. Findings indicate that Ag-ZnO NPs demonstrated relative narrow bandgap and efficient charge separation that resulted in enhanced photocatalytic activity under visible light illumination. The photocatalytic degradation of ATL and ACT fitted well with pseudo-first-order kinetic model. Further, it was found that under optimal conditions of 5 mg/L of contaminants, pH of 8.5, and catalyst dose of 1 g/L, degradation efficiency of 70.2% (ATL) and 90.8% (ACT) was achieved for a reaction time of 120 min. More than 60% reduction in TOC was observed for both contaminants and OH• pathway was found to be the major removal process. Ag-ZnO photocatalyst showed good recycling performance, and these findings indicate that it could be cost effectively employed for removing emerging contaminants under visible light radiation. © 2021, The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.

Author Keywords
Lawsonia inermis (Henna); Organic synthesis; Pharmaceutical contaminants; Photocatalysis; Wastewater treatment

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21) Arulraj, M.[a] , Palani, P.K.[b] , Sowrirajan, M.[a]

Optimization of squeeze casting parameters of hybrid aluminium matrix composite using Taguchi approach
(2021) *Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering*, 235 (4), pp. 1073-1081. Cited 13 times.

DOI: 10.1177/0954408921989864

[a] Department of Mechanical Engineering, Coimbatore Institute of Engineering and Technology, Coimbatore, India
[b] Department of Mechanical Engineering, Government College of Technology, Coimbatore, India

Abstract
Squeeze casting is one of the simplest processes of manufacturing of composite materials and it attains higher advantages of low material processing cost, easy handling of material, size, design and good stability of matrix structure. LM24 aluminium alloy reinforced with silicon carbide (SiC) and coconut shell ash (CSA) were used to prepare the composite. LM24 alloy had wide engineering applications, wherein the addition of SiC enhances the wear resistance and CSA particles offer significant technical and economic benefits. In the present study, the composite samples were prepared based on Taguchi experimental conditions L16 (4-levels and 5- parameters) through squeeze casting method. From the experimental results, percentage of reinforcement and squeeze pressure were most influential parameters on impact strength. The optimum casting condition was obtained by using Taguchi optimization. From microstructural study, applying high level of squeeze pressure improved the uniform dispersion, good bonding between the matrix and reinforcement. Also, 25% of impact strength was improved the composite using Taguchi optimum conditions compared than conventional alloys. Higher squeeze pressure seen to have refined dendritic structure with uniform distribution of reinforcement materials in the aluminium matrix. © IMechE 2021.

Author Keywords
coconut shell ash; LM24 aluminium alloy; squeeze casting; Taguchi method

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22) Kumar, K.R.[a] , Shyamala, G.[b] , Awoyera, P.O.[c] , Vedhasakthi, K.[d] , Olalusi, O.B.[e]

Cleaner production of self-compacting concrete with selected industrial rejects-an overview
(2021) *Silicon*, 13 (8), pp. 2809-2820. Cited 22 times.

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[a] Centre for Methods and Materials, Department of Civil Engineering, S R Engineering College, Warangal, Telangana, India
[b] Department of Civil Engineering, S R Engineering College, Warangal, Telangana, India
[c] Department of Civil Engineering, Covenant University, Ota, Nigeria
[d] Government College of Technology, Coimbatore, Tamil Nadu, India
[e] Discipline of Civil Engineering, University of KwaZulu-Natal, Durban, South Africa

Abstract
Sustainability issues have been a major concern in the construction field, owing to the overexploration of natural raw material sources. The high demand of natural materials is traceble to increasing urbanization and industrialization. Various landmark research achievement has been made in the production of self-compacting concrete in recent years. The focus has been on the use of wastes emanating from agricultural, construction, and industrial activities. However, finding a workable framework for the use of the alternative materials is still an issue. This study presented procedures for cleaner production of self-compacting concrete with selected industrial rejects. The use of waste materials (supplementary cementitious materials (S.C.M.) and recycled materials) were explored. The materials, according to research trend, were either utilized as a partial or total replacement of conventional materials. From the available data, the study found that industrial by-products demonstrated potential to serve as an alternative material in production of self-compacting concrete. It is shown from the study that greener, and sustainable S.C.C. with enhanced properties could be achieved by using industry rejects. The presented procedures will serve as a guide for industrial application of the materials, and also foster economic benefits to the construction sector. © 2020, Springer Nature B.V.

Author Keywords
Fibres; Green Self-compacting concrete; Industrial waste materials; Sustainable

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23) Prakash, R.[a] , Raman, S.N.[b] , Divyah, N.[c] , Subramanian, C.[a] , Vijayaprabha, C.[a] , Praveenkumar, S.[d]

Fresh and mechanical characteristics of roselle fibre reinforced self-compacting concrete incorporating fly ash and metakaolin
(2021) *Construction and Building Materials*, 290, art. no. 123209, . Cited 45 times.

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[a] Department of Civil Engineering, Alagappa Chettiar Government College of Engineering and Technology, Karaikudi, Tamil Nadu 630 003, India
[b] Civil Engineering Discipline, School of Engineering, Monash University Malaysia, Jalan Lagoon Selatan, Bandar Sunway, Selangor 47500, Malaysia
[c] Department of Civil Engineering, Government College of Technology, Coimbatore, Tamil Nadu, India
[d] Department of Civil Engineering, PSG College of Technology, Coimbatore, Tamil Nadu, India

Abstract
This study covered the fresh and mechanical characteristics of self-compacting concrete incorporating various fractions of (natural) roselle fibre (1 to 4% with 1% increment by weight of powder content). The fresh state behaviour of the composite was assessed by measuring the slump flow diameter, V-funnel flow time, L-box blocking ratio and J-ring step height. Meanwhile, the mechanical characteristics of the composite were determined by measuring the compressive strength, splitting tensile strength, modulus of rupture, modulus of elasticity and impact strength. Data collected from the experiments

of the fresh and mechanical characteristics of the roselle fibre reinforced self-compacting concrete mix were correlated and subjected to regression analysis. The findings indicated that the incorporation of the roselle fibre reduced the workability behaviour of the self-compacting concrete. By contrast, the mechanical characteristics, such as compressive strength, splitting tensile strength, modulus of rupture and modulus of elasticity were enhanced with increasing fibre content. However, 4% fibre addition resulted in a marginally decreased compressive strength and modulus of elasticity of the self-compacting concrete. Empirical equations were developed to correlate the splitting tensile strength, flexural strength and modulus of elasticity to the compressive strength with high values of coefficient of determination. Experimental findings were found to be in good agreement with existing correlations reported in standards and literature. © 2021 Elsevier Ltd

Author Keywords
Flexural toughness; Impact resistance; Mechanical properties; Natural fibre; Self-compacting concrete (SCC); Workability

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24) Srinivasan, V.P.[a] , Palani, P.K.[b] , Balamurugan, S.[a]

Experimental investigation on EDM of Si3N4–TiN using grey relational analysis coupled with teaching-learning-based optimization algorithm
(2021) *Ceramics International*, 47 (13), pp. 19153-19168. Cited 40 times.

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[a] Sri Krishna College of Engineering and Technology, Coimbatore, Tamil Nadu, India
[b] Government College of Technology, Coimbatore, Tamil Nadu, India

Abstract
Electric discharge machining of silicon nitride–titanium nitride (Si3N4–TiN) ceramic composites was conceded for making square and circular profiles. Five imperative machining parameters namely current, pulse-on time, pulse-off time, dielectric pressure and spark gap voltage have been contemplated to resolve the response characteristics like material removal rate, electrode wear rate, surface roughness and geometrical tolerances. Multi Criteria Decision Making techniques like GRA and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) are used to discover the optimal set of machining parameter combinations to accomplish maximum efficiency of all the responses. Also, Metaheuristic or nature inspired algorithm namely GRA coupled with TLBO algorithm is engaged for obtaining global optimum parameters. The parameters like the current, pulse-on time and spark gap voltage have the indicative impact on the responses like MRR, EWR and geometrical tolerances. It is acknowledged that the current and pulse-on time are most significant parameters among others. The optimal EDM parameters based on GRA and TOPSIS methods for obtaining better responses are current - 10 amps; pulse-on time - 8 µsec; pulse-off time - 4 µsec; dielectric pressure - 20 kg/cm2 and spark gap voltage - 32 V. © 2021 Elsevier Ltd and Techna Group S.r.l.

Author Keywords
Geometrical tolerances; GRA; MCDM; Surface roughness; TLBO; TOPSIS

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25) Moorthy, V.P., Subramanian, S., Balaji, O.S.P.

Compactible Level Measurement and Forewarning in Petrol Station
(2021) *Journal of Physics: Conference Series*, 1917 (1), art. no. 012003, .

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Department of Electronics and Instrumentation Engineering, Government College of Technology, Coimbatore, India

Abstract
It is known that India is the third-largest country in fossil fuel consumption, and the economy of India dramatically depends on the transportation of goods and services which require fuel. Petrol stations should ensure the correct fuel stock and restore the fuel on time once it gets exhausted. Thus, the customer's needs get satisfied. Generally, the level measurement in fuel storage tanks is carried out by physical methods which involve dipsticks or using some level sensors, float switch, and load cell. Dipsticks are more often used in level measurement. The usage of dipsticks involves a human operator removing and read the dipstick scale. The measured data is communicated to the refill manager through phone calls, and the petrol station gets refilled. The refilling of petrol station may get late due to improper communication and late transportation of fuel vehicles when stuck in traffic. This work aims to overcome the material problem and improve efficiency and accuracy in the level measurement of fuel by introducing automation in measurement and communication. The depth of the fuel tank is estimated by a level sensor accompanied by a Wi-fi module to bring out automation. The measured data can be accessed directly by the user through a telegram app. The level of the fuel tank is automatically indicated. The dynamically changing data of the fuel tank can also be acquired by using the telegram app. The refill manager will be aware of the fuel level, and fuel can be restored on time. This product will be very useful in remote areas. This product has vast potential and will play a significant role in fuel measurement for key oil companies. © Published under licence by IOP Publishing Ltd.

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26) Sasikumar, A.[a] , Gopi, S.[a] , Mohan, D.G.[b]

Effect of welding speed on mechanical properties and corrosion resistance rates of filler induced friction stir welded AA6082 and AA5052 joints
(2021) *Materials Research Express*, 8 (6), art. no. 066531, . Cited 21 times.

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[a] Department of Production Engineering, Government College of Technology, Coimbatore, India
[b] Institute of Materials Joining, Shandong University, Jinan, China

Abstract
Friction Stir Welding (FSW) was carried out to examine the influence of filler materials and varying process parameters on the microhardness and the joints corrosion resistance properties. Aluminium alloys 6082 and 5052, having 8 mm thickness was joined by varying parameters. The primary process parameters are rotational speed, tool travel speed, plunge depth, filler holes centre distance and filler ratio. The hardness at the weld nugget zone and corrosion rate evaluations were analyzed. The best results were obtained for the parameter combinations of 1150 rpm tool rotation, 130 mm min-1 tool travel, 0.2 mm tool plunge, the filler holes centre distance 2 mm and a powder filler made of 95% magnesium and 5% chromium. © 2021 The Author(s). Published by IOP Publishing Ltd.

Author Keywords
Aluminium alloys; Corrosion; Filler; Friction stir welding; Microstructure

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27) Mohan, D.G.[a] , Gopi, S.[b]

Influence of In-situ induction heated friction stir welding on tensile, microhardness, corrosion resistance and microstructural properties of martensitic steel
(2021) *Engineering Research Express*, 3 (2), art. no. 025023, . Cited 11 times.

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[a] Institute of Materials Joining, Shandong University, Jinan, China
[b] Government College of Technology, Coimbatore, Tamilnadu, India

Abstract
Induction Heated Friction Stir Welding (IH-FSW) was conducted using two varying parameters and two fixed parameters. The microstructure evaluation shows that the nugget zone's grain size is smaller while comparing with the parent metal. Due to dynamic recrystallization during the induction heated friction stir welding, well-equiaxed grains were found in the nugget zone. The microhardness test reveals that the welded region have improved hardness than the parent metal; the high hardness was attained in the heat-affected zone. The 3 h and 24 h of weight-loss corrosion test methods were conducted using the coefficient of 0.5 M H2SO4, showing that the stir zone's corrosion resistance is better than the parent material. The given parameter combinations obtain the best results, tool rotation of 1250 rpm, welding speed of 45 mm min−1, shoulder penetration of 0.50 mm and induction heat input of 441.8 °C at 50 W. © 2021 IOP Publishing Ltd.

Author Keywords
Corrosion; Friction stir welding; Induction heating; Microstructure; Stainless steel

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28) Jayaraman, A.B.[a] , Kandasamy, T.[b] , Venkataraman, D.[c] , S., M.[c]

Rational design of Shewanella sp. L-arabinose isomerase for D-galactose isomerase activity under mesophilic conditions
(2021) *Enzyme and Microbial Technology*, 147, art. no. 109796, . Cited 12 times.

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[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, 641013, India
[b] Department of Biotechnology, Maulana Abul Kalam Azad University of TechnologyWest Bengal, India
[c] Centre for Biotechnology, Anna University, Chennai, 600025, India

Abstract
D-Tagatose, a potential low calorific substitute for sucrose, can be produced by bioconversion of D-galactose catalysed by L-arabinose isomerase. L-Arabinose isomerase from Shewanella sp. ANA-3 is unique for its ability to catalyse bioconversion reactions under mesophilic conditions. However, D-galactose not being a natural substrate for L-arabinose isomerase is catalysed at a slower rate. We attempted to increase the biocatalytic efficiency of Shewanella sp. L-arabinose isomerase by rational design to enhance galactose isomerisation activity. In silico molecular docking, analysis has revealed that F279 is sterically hindering the binding of D-galactose at the C6 position. Substitution of bulky Phe residue with smaller hydrophilic residues such as Asn and Thr increased the galactose isomerase activity by 86 % and 12 % respectively. At mesophilic conditions, F279N mutant catalysed the bioconversion of D-galactose more efficiently than L-arabinose, indicating a shift in substrate preference. © 2021 Elsevier Inc.

Author Keywords
D-Galactose isomerase; D-Tagatose; L-Arabinose isomerase; Mesophilic; Molecular docking; Shewanella sp.; Site-directed mutagenesis

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29) P.S, K.[a] , Dhamodhara kannan, G.[b]

Effect of self-compacting concrete infill on the flexural behavior of hollow channel sections: Experimental and numerical studies
(2021) *Structural Concrete*, 22 (3), pp. 1720-1740.

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[a] Department of Civil Engineering, University College of Engineering, Anna University, Ariyalur, India
[b] Department of Civil Engineering, Government College of Technology, Coimbatore, India

Abstract
Use of hollow cold-formed steel (CFS) sections has gained popularity in the construction of light industrial and commercial structures. However, their overall load carrying capacity under flexure can be severely affected due to the possible buckling failure modes. Addition of concrete as an infill material for hollow CFS sections can significantly improve their overall performance by resisting their inward local buckling. In this paper, the effectiveness of self-compacting concrete (SCC) as an infill material for hollow channel sections (HCS) is investigated under flexure. In total, nine full-scale hollow channel sections with and without SCC infill are tested to understand the effect of different parameters namely (i) width to depth ratio, (ii) section thickness, and (iii) developed length. In addition, a detailed nonlinear finite element (FE) modeling was performed using the software ABAQUS. Moreover, an analytical investigation was performed to determine the ultimate moment capacity of SCC infilled sections using the strain compatibility procedure. Test results revealed that the addition of SCC infill helped in increasing the ultimate moment resistance by more than 100% when compared to the specimens with no infill. Moreover, the local buckling resistance of HCS is significantly improved due to the addition of SCC infill. The validated analytical and finite element models were used for performing an extensive parametric investigation. © 2021 fib. International Federation for Structural Concrete.

Author Keywords
finite element modeling; hollow channel section; local buckling; SCC infill

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30) Karthik, V.[a] , Senthil Kumar, P.[b] , Vo, D.-V.N.[c] , Selvakumar, P.[d] , Gokulakrishnan, M.[a] , Keerthana, P.[a] , Audilakshmi, V.[e] , Jeyanthi, J.[f]

Enzyme-loaded nanoparticles for the degradation of wastewater contaminants: a review
(2021) *Environmental Chemistry Letters*, 19 (3), pp. 2331-2350. Cited 38 times.

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[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, 641013, India
[b] Department of Chemical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Chennai, 603 110, India
[c] Center of Excellence for Green Energy and Environmental Nanomaterials (CE@GrEEN), Nguyen Tat Thanh University, Ho Chi Minh City, Viet Nam
[d] Department of Chemical Engineering, Adama Science and Technology University, Adama, 1888, Ethiopia
[e] Department of Biotechnology, KIT-Kalaignar Karunanidhi Institute of Technology, Coimbatore, 641402, India
[f] Department of Civil Engineering, Government College of Technology, Coimbatore, 641013, India

Abstract
Preventing water pollution and conserving water are major issues in the context of population growth and worldwide pollution, calling for advanced remediation techniques. Classical remediation techniques of water cleaning such as membrane adsorption are able to separate pollutants from water, yet the separated pollutants require additional treatment or disposal. Therefore, techniques that degrade the pollutant appear promising, provided that pollutants are organic and degradable. Here, we review the enzymatic degradation of organic pollutants with focus on methods to immobilize enzymes and nanoparticles as support materials. We discuss the degradation of pesticides, dyes, phenolic compounds and antibiotics. © 2021, The Author(s), under exclusive licence to Springer Nature Switzerland AG part of Springer Nature.

Author Keywords
Enzyme; Immobilization; Nanoparticles; Removal; Toxic pollutants; Wastewater

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31) Prakash, R.[a] , Thenmozhi, R.[b] , Raman, S.N.[c] , Subramanian, C.[a] , Divyah, N.[b]

Mechanical characterisation of sustainable fibre-reinforced lightweight concrete incorporating waste coconut shell

as coarse aggregate and sisal fibre
(2021) *International Journal of Environmental Science and Technology*, 18 (6), pp. 1579-1590. Cited 52 times.

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[a] Department of Civil Engineering, Alagappa Chettiar Government College of Engineering and Technology, Karaikudi, Tamilnadu 630 003, India
[b] Department of Civil Engineering, Government College of Technology, Coimbatore, Tamilnadu 641 013, India
[c] Department of Architecture and Built Environment, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia, Bangi, Selangor 43600 UKM, Malaysia

Abstract
The construction industry is largely dependent on concrete as a construction material. The aggregate occupies a major volume of concrete. However, the continuous extraction of granite rock for coarse aggregate leads to the increase in demand of natural resources of future generations. In this study, coconut shell, an agricultural waste, is used to replace conventional aggregate in concrete for producing coconut shell lightweight concrete. To enhance the weak mechanical characteristics of lightweight concrete, various contents of sisal fibre at 1%, 2%, 3% and 4% have been added on the basis of the binder's weight. Mechanical properties, such as compressive strength, split tensile strength, flexural strength, elastic modulus and impact resistance, were examined. Results showed that the compressive strength increased by up to 6% when 3% fibre was added. An improvement in split tensile strength of 14%, flexural strength of 11% and modulus of elasticity of 6% was observed when a maximum of 3% fibre was added. Impact resistance was also excellent after the addition of sisal fibre. Thus, coconut shell concrete with sisal fibre is considered as a suitable and eco-friendly construction material alternative for the construction industry. © 2020, Islamic Azad University (IAU).

Author Keywords
Agricultural waste; Fibre-reinforced concrete; Fly ash; Lightweight concrete; Natural fibre; Sustainability

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32) Kumar, M.[a] , Krishnaveni, V.[a] , Muthukumar, S.[b]

Geotechnical Investigation and Numerical Analysis of Slope Failure: A Case Study of Landslide Vulnerability Zone in Kolli Hills, Tamil Nadu
(2021) *Journal of the Geological Society of India*, 97 (5), pp. 513-519. Cited 4 times.

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[a] Department of Geotechnical Engineering, Government College of Technology, Coimbatore, 641 013, India
[b] Department of Civil Engineering, Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Coimbatore, 641 112, India

Abstract
Landslides are the downward movement of materials under the influence of gravity when shear stress exceeds the shear strength of the material. It includes various movements resulting in complex type of slope failures which commonly occurred on cut slopes of Ghat roads in mountaneous region. The study area chosen for the geotechnical investigation is Kolli hills situated in the tail end of the Eastern Ghats in Namakkal district of Tamil Nadu, India. The ghat road section of 20 km stretch along with 70 hairpin bends, connects the foothills at Karavallikkombai to Sholaikkadu at the top is selected for the present study. The hill is situated at a fault zone which is extended from Mettur dam, Salem district, Tamil Nadu. In this study, undisturbed soil samples were collected from 10 landslide locations and tested for its index and engineering properties. Based on the test results, static slope stability analysis using Modified Bishop method and dynamic slope stability analysis using Simplified Newmark method were carried out to find out factor of safety of the slopes which is used to derive the slope stability assessment of the study area. The landslide hazard zone assessment was carried out to identify the landslide prone areas. © 2021, Geol. Soc. India.

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33) Ramachandran, R.[a] , Satheesh Kumar, J.[a] , Madasamy, B.[b] , Veerasamy, V.[c]

A hybrid MFO-GHNN tuned self-adaptive FOPID controller for ALFC of renewable energy integrated hybrid power system
(2021) *IET Renewable Power Generation*, 15 (7), pp. 1582-1595. Cited 21 times.

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[a] Department of Electrical Engineering, Government College of Technology, Coimbatore, India
[b] Department of Electrical Engineering, Alagappa Chettiar College of Engineering and Technology, Karaikudi, India
[c] Advanced Lightning, Power and Energy Research (ALPER), Department of Electrical and Electronics Engineering, Faculty of Engineering, Universiti Putra Malaysia (UPM)Selangor, Malaysia

Abstract
This paper proposes a hybrid moth flame optimization–generalized Hopfield neural network (MFO-GHNN) optimized self-adaptive fractional order proportional integral derivative (FOPID) controller for automatic load frequency control of multi-area hybrid power system (HPS). The control problem is formulated with an objective function of area control error associated with unknown parameters such as Kp, Ki, Kd, λ and μ of FOPID controller. The fractional order of differentiator and integrator terms, and the initial values of Kp, Ki and Kd, are drawn from MFO algorithm. Then, the Kp, Ki and Kd are fine-tuned by solving the dynamic equations governing the behaviour of GHNN under system uncertainties. To test the practicability and effectiveness of the proposed controller, the multi-area HPS is studied with uncertain change in load demand, system parameters, solar and wind power generation. The proposed method is modelled using MATLAB/Simulink. The results showed that the steady state and transient performance indices of proposed FOPID controller are significantly enhanced than the PID, MFO-FOPID and GHNN-PID controllers. In addition, the stability of non-linear dynamic HPS is analysed using Matignon's theorem of stability. Further, the performance of controller is validated using real time digital simulator run in hardware-in-the loop environment. © 2021 The Authors. IET Renewable Power Generation published by John Wiley & Sons Ltd on behalf of The Institution of Engineering and Technology

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34) Vasaki E, M.[a] , Karri, R.R.[b] , Ravindran, G.[c] , Paramasivan, B.[d]

Predictive capability evaluation and optimization of sustainable biodiesel production from oleaginous biomass grown on pulp and paper industrial wastewater
(2021) *Renewable Energy*, 168, pp. 204-215. Cited 24 times.

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[a] Department of Environmental Engineering, Government College of Technology Coimbatore, India
[b] Petroleum and Chemical Engineering, Faculty of Engineering, Universiti Teknologi Brunei, Brunei Darussalam
[c] Department of Civil Engineering, S R Engineering College WarangalTelangana, India
[d] Department of Biotechnology & Medical Engineering, National Institute of Technology Rourkela, India

Abstract
Biodiesel, as a green fuel, acts as a potential candidate to supplement conventional fossil fuels. This research study targets green environment (using biodiesel) and clean environment (reduce wastewater) by producing biodiesel through oleaginous biomasses (Yarrowia lipolytica, Metschnikowia pulcherrima and Lipomyces starkeyi) grown on pulp and paper industrial wastewater. Batch culture studies were explored for the potential feedstock of the oleaginous organism by the synthesis of single cell oil and fatty acid methyl ester (FAME) yield. Response surface methodology (RSM) was used to design the optimal experimental matrix and identify the optimal process conditions that enhance the FAME yield. To determine the inherent characteristics of the growth of oleaginous biomasses on the industrial wastewater, a data-driven adaptive neuro-fuzzy inference system (ANFIS) is implemented. Y. lipolytica strain cultured shown high biomass concentration of 32.36 g/l with biomass productivity of 5.39 g/l/d was considered for further scale-up for the transesterification process. Results indicated that the maximum yield of 0.48 (g-biodiesel/g-lipid) was obtained under the 2.5 g of lipid dosage with 0.02 g/ml of catalyst concentration by constant stirring at 70 °C. The optimum conditions to achieve maximum FAME yield of 1.154 g/g was obtained at 2.485 g, 70.87 °C and 0.021 g/ml for lipid dosage, temperature and catalyst concentrations, respectively. © 2020 Elsevier Ltd

Author Keywords
Adaptive neuro-fuzzy inference system; Biodiesel; Box-Behnken design; Fatty acid methyl ester; Oleaginous biomass; Response surface methodology

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35) Duraisamy, K.[a] , Ismailgani, R.[b] , Paramasivam, S.A.[c] , Kaliyaperumal, G.[d] , Dillikannan, D.[e]

Emission profiling of a common rail direct injection diesel engine fueled with hydrocarbon fuel extracted from waste high density polyethylene as a partial replacement for diesel with some modifications
(2021) *Energy and Environment*, 32 (3), pp. 481-505. Cited 13 times.

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[a] Department of Mechanical Engineering, Government College of Technology, Anna University, Coimbatore, India
[b] Department of Mechanical Engineering, Government College of Engineering, Anna University, Srirangam, India
[c] Department of Mechanical Engineering, Annamalai University, Chidambaram, India
[d] Department of Mechanical Engineering, New Horizon College of Engineering, Visvesvaraya Technological University, Bengaluru, India
[e] Department of Mechanical Engineering, Jeppiaar Engineering College, Anna University, Chennai, India

Abstract
A hydrocarbon fuel extracted from waste high-density polyethylene (WHDPE) by catalytic pyrolysis in a batch scale reactor is blended with diesel by 30% vol. (called as D70H30) is tested in a variable compression ratio engine equipped with a common rail system. Experiments were conducted at three compression ratios (16:1, 17.5:1, and 19:1) and exhaust gas re-circulation (EGR) rates (0%, 10%, and 20%) at the engine's rated power to evaluate its combustion, performance and emission characteristics. The results revealed that, increasing the compression ratio resulted in higher peak cylinder pressure (PCP) and heat release rates (HRR). Introduction of EGR diminished both PCP and HRR peaks. The brake thermal efficiency of D70H30 blend was 4% lower than diesel at same operating conditions which got better at higher compression ratio without EGR. NOx emission was highest when injected at compression ratio 19:1 and at 0% EGR rate which was 6% and 3% higher than diesel and D70H30 blend operated at engine stock settings. In comparison with baseline diesel smoke opacity remained lower at all operating conditions, where lowest smoke emission was recorded at CR19 and at 0% EGR rate. UHC and CO emission followed the similar trend of smoke opacity. Whereas CO2 emission increased with compression ratio and reduced with induction of EGR. It can be concluded from the study that at higher compression ratio and low EGR rates D70H30 blend can be effectively utilized in a CRDi engine. © The Author(s) 2020.

Author Keywords
Diesel engine; emissions; HDPE; plastics; waste to energy

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36) Gokila, A.[a] , Ayyappan, S.[b]

Quantum chemical insight properties of glyphosine(N, N-Bis (phosphonomethyl) glycine) – a combined hf and density functional study
(2021) *Digest Journal of Nanomaterials and Biostructures*, 16 (2), pp. 535-554.

DOI: 10.15251/DJNB.2021.162.535

[a] Department of Science and Humanities, Sri Eshwar College of Engineering, Tamil Nadu, Kinathukkadavu, 641202, India
[b] Department of Physics, Government College of Technology, Tamil Nadu, Coimbatore, 64101, India

Abstract
The ab initio HF and Density Functional (DFT / B3LYP) method with a 6-31G(d, p) basis was used to declare a geometric structure and vibrational wave ranges of the glyphosine (GPS) (N, N-Bis (phosphonomethyl) glycine). HF and DFT calculations have optimized geometric hops. The B3LYP method, basis set on a 6-31 G (d, p), is the best level in theory for repeating constructive wave numbers.Density functional theory was used to explore the first hyperpolarizability (β) of the GPS. The results of the computations also indicate that the fragment GPS could be analyzed with Natural Bond Orbital (NBO). The FT-IR and FT-Raman theoretical spectra were constructed for the title component. The prospective, absolute and partial molecular electrostatic density (TDOS, PDOS) was evaluated for the GPS. The established energy from HOMO and LUMO shows that the charge is transferred in the fragment.

Author Keywords
DOS; Glyphosine (GPS); HOMO-LUMO; NBO analysis; PES scan

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37) Kala, R.[a] , Deepa, P.[b]

Spatial Rough Intuitionistic Fuzzy C-Means Clustering for MRI Segmentation
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[a] Department of Computer Science and Engineering, Hindusthan Institute of Technology, Coimbatore, 641028, India
[b] Electronics and Communication Engineering, Government College of Technology, Coimbatore, Tamilnadu 641 013, India

Abstract
Medical image segmentation is the challenging problem in real-time applications due to the occurrence of noise and uncertainties between different tissues in the magnetic resonance images (MRI). To overcome the issue, spatial rough intuitionistic fuzzy C-means method has been proposed. The segmentation of MR brain image has been implemented by updating the MRI based on global spatial information of pixel with intuitionistic fuzzy c-means algorithm for segmenting cerebro spinal fluid, white matter and gray matter tissues. Intuitionistic fuzzy sets and rough sets have been used to deal with uncertainty and vagueness in medical images. Intuitionistic fuzzy sets are used for image representations by using non-membership value, hesitation along with the membership value for the MR image. The membership value and non-membership value have been obtained using fuzzy hexagonal membership and fuzzy complement function respectively. Further, roughness measures are done to determine the initial cluster centroids by considering lower and upper approximation and the fuzzy c-means clustering algorithm has been updates by the euclidean distance between the pixels based on global spatial information for segmenting MR brain image. The proposed method have been implemented and analysed with quantitative and qualitatively for the synthetic and real MR images. Experimental results exhibit a higher degree of segmentation accuracy on both synthetic and real MR images compared to existing methods and achieves better performance. Graphic abstract: [Figure not available: see fulltext.]

Author Keywords
Classification; Fuzzy set; Intuitionistic fuzzy set; Magnetic resonance image; Rough set theory

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38) Nithya, R.[a] , Thirunavukkarasu, A.[a] , Sathya, A.B.[b] , Sivashankar, R.[c]

Magnetic materials and magnetic separation of dyes from aqueous solutions: a review
(2021) *Environmental Chemistry Letters*, 19 (2), pp. 1275-1294. Cited 82 times.

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[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, 641013, India
[b] Department of Biotechnology, Aarupadai Veedu Institute of Technology, Chennai, 603104, India
[c] Department of Chemical Engineering, Hindustan Institute of Technology and Science, Chennai, 603103, India

Abstract
Dye pollution from industries such as dyeing, textile, leather, cosmetics and pigments is of increasing concern, calling for advanced methods of wastewater remediation. Many techniques have been applied to treat such effluents, but adsorption remains the easiest, low-cost, effective and reliable strategies. The recent development of magnetic composites combines properties of both organic and inorganic components and is thus opening new applications for color removal. Here, we review the use of magnetic nanomaterials to adsorb dyes from aqueous solutions. We present sources of water contamination, actual technologies for wastewater treatment, the impact of dyes on health and the environment, dye removal methodologies, and the advantages of magnetic separation. We also discuss nanoparticle synthesis, results on magnetic nanomaterials for dye adsorption, and adsorption models. © 2021, Springer Nature Switzerland AG.

Author Keywords
Adsorption; Dyes; Magnetic nanomaterials; Magnetic separation

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39) Karthik, V.[a] , Kumar, P.S.[b] , Vo, D.-V.N.[c] , Sindhu, J.[a] , Sneka, D.[a] , Subhashini, B.[a] , Saravanan, K.[d] , Jeyanthi, J.[e]

Hydrothermal production of algal biochar for environmental and fertilizer applications: a review
(2021) *Environmental Chemistry Letters*, 19 (2), pp. 1025-1042. Cited 33 times.

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[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, 641013, India
[b] Department of Chemical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Chennai, 603 110, India
[c] Center of Excellence for Green Energy and Environmental Nanomaterials (CE@GrEEN), Nguyen Tat Thanh University, Ho Chi Minh City, Viet Nam
[d] Department of Chemical Engineering, Kongu Engineering College, Perundurai, 638060, India
[e] Department of Civil Engineering, Government College of Technology, Coimbatore, 641013, India

Abstract
Climate change and pollution induced by fossil fuel consumption is calling for alternative, renewable organic products in the context of the future circular economy. For instance, biochar has emerged as a versatile material produced during pyrolysis, hydrothermal liquefaction and gasification of biomass such as algae, plant and organic waste. Here, we review algal biomass, biochar production by hydrothermal liquefaction, biochar properties and biochar fertilizer value for plant growth. © 2020, Springer Nature Switzerland AG.

Author Keywords
Algal biomass; Biochar; Fertilizer; Hydrothermal process; Pollution

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40) Nithya, R.[a] , Sivasankari, C.[b] , Thirunavukkarasu, A.[a]

Electronic waste generation, regulation and metal recovery: a review
(2021) *Environmental Chemistry Letters*, 19 (2), pp. 1347-1368. Cited 95 times.

DOI: 10.1007/s10311-020-01111-9

[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, 641013, India

[b] Department of Chemistry, Government College of Technology, Coimbatore, 641013, India

Abstract
Waste will become the major resource in the future circular economy. In particular, E-waste is a major sector growing at an annual rate of about 2 million tonnes (Mt) with rising users of electrical and electronic items worldwide. This is a consequence of versatility and affordability of technological innovation, thus resulting in massive sales and e-waste increases. Most end-users lack knowledge on proper recycling or reuse, often disposing of e-waste as domestic waste. Such improper disposals are threatening life and ecosystems because e-waste is rich in toxic metals and other pollutants. Here we review e-waste generation, policies and recycling methods. In 2019, the world e-waste production reached 53.6 Mt, including 24.9 Mt in Asia, 13.1 Mt in USA, 12 Mt in Europe. In Asia, China (10.1 Mt), India (3.23 Mt), Japan (2.57 Mt) and Indonesia (1.62 Mt) are the largest producers contributing to about 70% of the total world e-waste generated. Only 17.4% (9.3 Mt) of the world e-waste was recycled by formal means, and the remaining 82.6% (44.3 Mt) was left untreated or processed informally. As a consequence, most countries have framed policies to provide regulatory guidelines to producers, end-users and recyclers. Yet the efficiency of these local policies are limited by the transfer of products across borders in a globalized world. Among formal recycling techniques, biohydrometallurgy appears most promising compared to pyrometallurgy and hydrometallurgy, because biohydrometallurgy overcomes limitations such as poor yield, high capital cost, toxic chemicals, release of toxic gases and secondary waste generation. Challenges include consumer's contempt on e-waste disposal, the deficit of recycling firms and technology barriers. © 2020, Springer Nature Switzerland AG.

Author Keywords
Bio-hydrometallurgy; e-waste; e-waste management; Generation; Hydro-metallurgy; Informal and formal recycling; Metal recovery process; Practical challenges; Pyro-metallurgy; Regulations

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41) Madhavapandian, S.[a] , MaruthuPandi, P.[b]

System Level Protection Against Side-Channel Attack Using High Performance Virtual Secure Circuit for Cryptographic Processor
(2021) *Wireless Personal Communications*, 117 (4), pp. 2667-2677. Cited 1 time.

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[a] Department of Electronics and Communication Engineering, Solamalai College of Engineering, Madurai, India
[b] Department of Electrical Engineering, Government College of Technology, Coimbatore, India

Abstract
The proposed system portrays the application space examination of a diverse cryptosystem processor with dynamic reconfiguration abilities. It is appropriate to a variety of signal processing application domains namely telecommunications, image processing, video coding and cryptographic processing. To differentiate between application spaces of the processor, the performance is correlated with cutting edge devices, taking ability to program, energy efficiency and computational potential as the important factors. In general the conventional method of computation is processed by means of Virtual Secure Circuit (VSC) on Advanced Encryption Standard (AES) and performance of the device Field Programmable Gate Array (FPGA) after implementation is analyzed in terms of delay and throughput. In the conventional method area overhead and power consumption are less where as the architecture lags in performance and throughput. It has been overcome through the fully parallel pipelined Architecture of the VSC on AES which outperforms the existing method in terms of performance and throughput. The energy efficiency and performance are considerably more important than processor that are used for general purpose, while still preserving a Convenient approach of programming that mainly bank on software oriented languages. The exploit of VSC based AES is to formulate the cryptographic processor held against Side Channel Attacks like attacks based on power supply and electromagnetic signals. Then the experimental result shows the promising outcomes when compared to previous methods. © 2019, Springer Science+Business Media, LLC, part of Springer Nature.

Author Keywords
AES; Electromagnetic signals; FPGA; VSC

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42) Miraclin Joyce Pamila, J.C.[a] , Ajithkumar, A.[a] , Senthamil Selvi, R.[b]

Natural language processing based identification of Related Short Forum Posts through Knowledge Based Conceptualization
(2021) *Proceedings - International Conference on Artificial Intelligence and Smart Systems, ICAIS 2021*, art. no. 9396051, pp. 1733-1740.

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[a] Government College of Technology, Department of Computer Science and Engineering, Coimbatore, India
[b] Saranathan College of Engineering, Department of Computer Science and Engineering, Trichy, India

Abstract
Online communities collaborate and users share their views using online forums. The experience and ideas shared by the users in the forum are rich but finding relevant forum posts is laborious and frustrating. This research is targeted towards comparing a post at hand to find forum posts related to it. The conventional methods for identifying text similarity are not as efficient as they do not conceptualize the short text and lead to poor performance in finding related content. This paper proposes a novel scheme for the identification of related short forum posts in discussion forums. Contrary to the use of fixed vocabulary sets in the existing schemes, the proposed method uses distinct words in the forum post pair to form a joint word set dynamically. The knowledge base is used for deriving a raw semantic vector for each forum post. Further, the two semantic vectors are used for the computation of semantic similarity. The proposed framework uses inverted indexing to improve the efficiency of retrieving relevant forum posts by reducing the search space with synonyms of the forum post at hand. It is proven to be efficient in finding related forum posts in discussion forums with a recall of 90% through a set of tests conducted. It is also observed that precision can be improved with the Named Entity Recognition method. © 2021 IEEE.

Author Keywords
Cosine Similarity; Forum Posts; Inverted Index; Knowledge Base; Semantic Similarity; Web Forum

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43) Rooby, D.R.[a b] , Kumar, T.N.[a] , Harilal, M.[a c] , Sofia, S.[a] , George, R.P.[a] , Philip, J.[a c]

Enhanced corrosion protection of reinforcement steel with nanomaterial incorporated fly ash based cementitious coating
(2021) *Construction and Building Materials*, 275, art. no. 122130, . Cited 25 times.

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[a] Corrosion Science and Technology Division, MCG, Metallurgy and Materials Group, IGCAR, Kalpakkam, 603 102, India
[b] Department of Structural Engineering, Government College of Technology, Coimbatore, Tamil Nadu 641 013, India
[c] Homi Bhabha National Institute, Mumbai, 600 094, India

Abstract
This work evaluated the performance of a novel nanophase modified fly ash based cement polymer coating over steel reinforcements in a corrosive environment. Five types of coatings were prepared with 100 wt. % Ordinary Portland Cement (CC), OPC replaced with 40 wt. % fly ash (CF), and CF admixed with 2 wt. % nano-CaCO3 (CFC), nano-SiO2 (CFS) and nano-ZrO2 (CFZ). Electrochemical studies were carried out under exposure to chlorides and the long term performance was evaluated by impressed voltage test. The microstructure of the developed coatings and chemical composition of corrosion products were analyzed using SEM, XRD, and LRS. The instantaneous corrosion rates of CFC, CFS, and CFZ coated rebars were found to be notably lower than CF coated rebars. The accelerated studies using impressed voltage test indicated a significantly longer initiation time for cracking in nanomaterials incorporated coatings than the conventional cement polymer coating. The evaluation of electrochemical parameters like open circuit potential, corrosion current, and polarization resistance showed that the addition of nano-ZrO2 significantly enhanced the corrosion performance of cementitious coatings as compared to other nanomaterials owing to its better dispersibility, without aggregation in

cementitious product, which was further confirmed from the particle size distribution measurement using dynamic light scattering technique. The XRD patterns and laser Raman spectra results confirm negligible corrosion products on CFZ coated rebars. The visual inspection of rust formation and weight loss measurements of CFZ coated rebars, subjected to salt spray and chemical resistance tests corroborated its long term durability in chloride-rich environment. Our results suggest the important benefits of nanomaterial incorporated fly ash cementitious coating on rebars in corrosion protection. © 2020 Elsevier Ltd

Author Keywords
Coatings; Corrosion; Fly ash; Nano-phase modification; Reinforcements

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44) Sowdambikai, S.[a] , Vijayaprabha, C.[a] , Prakash, R.[a] , Ravathi, M.C.[b]

Experimental and analytical study on properties of self-curing concrete
(2021) *AIP Conference Proceedings*, 2327, art. no. 020029, . Cited 3 times.

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[a] Alagappa Chettiar Government College of Engineering and Technology, Karaikudi, India
[b] Government College of Technology, Coimbatore, India

Abstract
Proper and complete curing in concrete is a predominant problem prevailing in the field of construction and management. Hence, to ensure complete curing in concrete, a supplementary self-curing agent can be added. The current investigational study observes the effects of self-curing agent Poly Ethylene Glycol (PEG) on various properties such as compressive strength, split tensile strength and flexural strength at discrete proportions of 0.5%, 1.0%, 1.5% & 2.0% by weight of cement. Also, the properties of concrete are predicted by the regression analysis. The amount of PEG to be added is optimized to be 1.5% by the weight of cement. Regression coefficients of 0.971 and 0.891 shows a proper correlation between compressive strength and flexural strength and also between compressive strength and split tensile strength. © 2021 Author(s).

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45) Prasanth, P.[a] , Sekar, T.[b] , Sivapragash, M.[c]

Investigations on the effects of nitrogen gas in CNC machining of SS304 using Taguchi and Firefly Algorithm
(2021) *Bulletin of the Polish Academy of Sciences: Technical Sciences*, 69 (1), art. no. e136211, . Cited 4 times.

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[a] Department of Mechanical Engineering, Tagore Institute of Engineering and Technology, Deviyakurichi, Salem, Tamilnadu 636112, India
[b] Department of Mechanical Engineering, Government College of Technology, Coimbatore, Tamilnadu 641013, India
[c] Department of Mechanical Engineering, Universal College of Engineering and Technology, Vallioor, Tirunelveli, Tamilnadu 627117, India

Abstract
This work attempts to use nitrogen gas as a shielding gas at the cutting zone, as well as for cooling purposes while machining stainless steel 304 (SS304) grade by Computer Numerical Control (CNC) lathe. The major influencing parameters of speed, feed and depth of cut were selected for experimentation with three levels each. Totally 27 experiments were conducted for dry cutting and N2 gaseous conditions. The major influencing parameters are optimized using Taguchi and Firefly Algorithm (FA). The improvement in obtaining better surface roughness and Material Removal Rate (MRR) is significant and the confirmation results revealed that the deviation of the experimental results from the empirical model is

found to be within 5%. A significant improvement of reduction of the specific cutting energy by 2.57% on average was achieved due to the reduction of friction at the cutting zone by nitrogen gas in CNC turning of SS 304 alloy.

Author Keywords
Firefly Algorithm; Optimization; SS304 alloy; Taguchi method; Turning

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46) Jayalakshmi, R., Jeyanthi, J.

Dynamic modelling of Alginate - Cobalt ferrite nanocomposite for removal of binary dyes from textile effluent
(2021) *Journal of Environmental Chemical Engineering*, 9 (1), art. no. 104924, . Cited 22 times.

DOI: 10.1016/j.jece.2020.104924

Department of Civil Engineering, Government College of Technology, Coimbatore, India

Abstract
The performance of Alginate - Cobalt ferrite (ACF) in a fixed bed column was assessed for the simultaneous removal of binary dyes from textile effluent. The binary dye effluent containing 32.5 mg/L of reactive red 195 (RR195) and 21 mg/L of reactive yellow 145 (RY145) was used for the study. The effect of various parameters like bed depth (3, 6, 9 and 12 cm) and flow rate of influent (5, 7.5 and 10 mL/min) for the binary adsorption using ACF was studied. The results revealed that ACF bed capacity and maximum adsorption capacity showed an increasing trend with an increased bed depth and decreased flow rate. Dynamic modeling such as Yoon - Nelson model, Thomas model and Bed Depth Service Time model (BDST) were evaluated with the experimental data. Comparatively, Yoon - Nelson and Thomas model presented better fitness for the elimination of RR195 and RY145 dye. The experimental data from dynamic studies revealed ACF's effectiveness for the sequestration of binary dyes from textile effluent.

Author Keywords
Alginate - Cobalt ferrite nanocomposite; Binary dye adsorption; Dynamic modeling; Fixed bed column; Real-time effluent

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47) Narasimhan, M.[a] , Chandrasekaran, M.[b] , Govindasamy, S.[b] , Aravamudhan, A.[a]

Heterogeneous nanocatalysts for sustainable biodiesel production: A review
(2021) *Journal of Environmental Chemical Engineering*, 9 (1), art. no. 104876, . Cited 51 times.

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[a] Department of Genetic Engineering, School of Bioengineering, Srm Institute of Science and Technology, Kattankulathur Tamil Nadu, 603203, India
[b] Department of Industrial Biotechnology, Government College of Technology, Coimbatore Tamil Nadu, 641013, India

Abstract
Recently, biodiesel production gained more attention due to its benefits against environmental pollution. For biodiesel production, heterogeneous catalysts were highly preferred in comparison to homogeneous catalysts due to its effective separation steps for both products and catalysts, eliminate quenching process, and offer conditions for the continuous production system. Recent studies revealed that nanoparticles are widely used as a heterogeneous catalyst for the production of biodiesel and usage of heterogeneous nanocatalyst is increasing rapidly. To reach its depth, the current review is focused on the application of various heterogeneous nanocatalysts for the production of biodiesel.

Author Keywords
Biodiesel; Heterogeneous; Nanocatalyst

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48) Anbu Chudar Azhagan, S.[a] , Marianandhakumar, V.[b]

Crystallization of pure adipic acid from methanol solvent and their characterization studies: Intense NLO activity from Centrosymmetric crystal
(2021) *Optik*, 227, art. no. 166002, . Cited 6 times.

DOI: 10.1016/j.ijleo.2020.166002

[a] Department of Physics, Govt.college of Technology, Coimbatore, 641013, India
[b] Department of Physics, Sri Krishna College of Technology, Coimbatore, 641042, India

Abstract
The influence of methanol solvent in assisting the nucleation of adipic acid crystals has been investigated for the first time. The pH value and nucleation period was determined. The better- quality adipic acid single crystals having crystal size up to 10 × 7 x 6mm3 were grown successfully by conventional slow solvent evaporation experiment at room temperature and their solubility has been experimented with four different solvents namely methanol, ethanol, acetone and water at three different temperature 30°, 40° and 50° respectively. Crystallographic information, crystalline nature and characteristic h k l planes of adipic acid was revealed by single crystal XRD and powder XRD studies. The direct optical band gap energy, characteristic functional groups and other information like thermal decomposition temperature, melting point were studied from UV –Vis-NIR, Spectroscopic FTIR and TG-DTA instrument analysis. The measured powder SHG efficiency of adipic acid is found to be 2.14 times superior to the reference material potassium dihydrogen phosphate (KDP). © 2020

Author Keywords
adipic acid; Crystal growth; Crystal structure; FTIR; Recrystallization; Thermal properties

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49) Mercy Nisha Pauline, J.[a] , Sivaramakrishnan, R.[b] , Pugazhendhi, A.[c] , Anbarasan, T.[d] , Achary, A.[e]

Transesterification kinetics of waste cooking oil and its diesel engine performance
(2021) *Fuel*, 285, art. no. 119108, . Cited 36 times.

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[a] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, Tamil Nadu 641013, India
[b] Laboratory of Cyanobacterial Biotechnology, Department of Biochemistry, Faculty of Science, Chulalongkorn University, Bangkok, 10330, Thailand
[c] Innovative Green Product Synthesis and Renewable Environment Development Research Group, Faculty of Environment and Labour Safety, Ton Duc Thang University, Ho Chi Minh City, Viet Nam
[d] Department of Environmental Engineering, Government College of Technology, Coimbatore, Tamil Nadu 641013, India
[e] Department of Biotechnology, Kamaraj College of Engineering & Technology, Virudhunagar, Tamil Nadu 626001, India

Abstract
Biodiesel is one of the renewable forms of energy and waste cooking oil (WCO) serves as an effective source to produce biodiesel through the process of transesterification. Kinetic studies on such chemical reactions help in scaling up the process, simulation studies including designing of reactors. In the present study, waste cooking oil was subjected to conventional transesterification process catalyzed by methanol and 1% (w/v) catalyst sodium hydroxide under different temperatures (40–65 °C). Methanol-oil was taken in the ratio 6:1 and maximum yield of biodiesel obtained was found to be 90% at 60 °C. The activation energy Ea of transesterification reaction of WCO to biodiesel was calculated and found to be 27.24 kJ/mol. A linear Arrhenius plot and high value of R2 confirmed the irreversible pseudo-second order of the reaction. The biodiesel was characterized for various fuel properties such as calorific value, ash content and cetane number. Engine

testing using lab scale internal combustion engine (ICE) revealed an increase in power output with lower fuel consumption with reduction of CO, CO2, NOx, HC emission. Hence this study concluded that the WCO could be a potential feedstock to produce biodiesel. © 2020 Elsevier Ltd

Author Keywords
Activation energy; Biodiesel; Emission reduction; Engine testing; Transesterification; Waste cooking oil

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50) Suguna, T.[a] , Shanmugalakshmi, R.[b]

Secure Image Communication Through Adaptive Deer Hunting Optimization Based Vector Quantization Coding of Perceptually Encrypted Images
(2021) *Wireless Personal Communications*, 116 (3), pp. 2239-2260. Cited 9 times.

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[a] Department of Information Technology, Government College of Technology, Coimbatore, 641013, India
[b] Alagappa Chettiyar Government College of Technology, Karaikudi, 630003, India

Abstract
Communication fields are growing rapidly in the recent era, so transmitting the multimedia contents through an open channel becomes a challenging task. The multimedia contents that are transmitted through this channel are highly prone to vulnerabilities and attacks. Therefore, secure and efficient data communication is considered as a major concern in the multimedia communication systems. So, major efforts are taken by researchers to safeguard the originality of each image. In a conventional system, the secure image communication process was achieved by compressing the content first, and then encryption is performed over the compressed data. Even though it met the required security and compression ratio, but some applications may require the reverse system. In this method, the encryption process is conducted prior to compression to improve the privacy of user data. Moreover, the initial concentration is given for improving content privacy rather than concentrating on size reduction. This paper proposes a reversed system that uses block based perceptual encryption algorithm for encryption and vector quantization (VQ) with hybrid Lloyd–Buzo–Gray (LBG)-Adaptive Deer Hunting Optimization (ADHO) algorithm (VQ-LBG-ADHO) for compression. So, the content secrecy gets improved. The involvement of this adaptive optimization method enhances the performance of VQ in the compression process. This method highly concentrates on secure communication, so the reverse process is followed in this method. It not only improves the image secrecy, however, it further enhances the image quality. The performance of this secure communication process is compared with state-of-the-art algorithms, and the results reveal that the proposed method outperforms the other existing methods. © 2020, Springer Science+Business Media, LLC, part of Springer Nature.

Author Keywords
Adaptive scanning; Compression and vector quantization; Encryption; Perceptual encryption; Permutation

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51) Divyah, N.[a] , Thenmozhi, R.[a] , Neelamegam, M.[b] , Prakash, R.[c]

Characterization and behavior of basalt fiber-reinforced lightweight concrete
(2021) *Structural Concrete*, 22 (1), pp. 422-430. Cited 34 times.

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[a] Department of Civil Engineering, Government College of Technology, Coimbatore, India
[b] Department of Civil Engineering, Easwari Engineering College, Chennai, India
[c] Department of Civil Engineering, Alagappa Chettiar Government College of Engineering and Technology, India

Abstract
The improvised construction techniques and utilization of industrial wastes in manufacturing concrete play a major role in sustainability. The artificially manufactured aggregates are gaining importance in the present era. The use of fibers as secondary reinforcement is greatly pronounced. Sintered fly ash aggregate concrete and normal aggregate concrete with and without basalt fiber with 28 days compressive strength of 30 Mpa were cast and tested. The stress–strain curve of the lightweight concrete has a lower modulus of elasticity when compared with the normal aggregate concrete. A simple linear relationship has been developed between the mechanical properties using regression analysis. The water absorption and void ratio had a direct relationship with the sorptivity and ponding of concrete. The strength and durability aspects of the lightweight aggregate concrete had better agreement with the requirements of the structural lightweight concrete. Strict adherence to codal provisions with respect to strength and durability can be made for improvised behavior. © 2020 fib. International Federation for Structural Concrete

Author Keywords
basalt fiber; compressive strength; flexural strength; ponding; sintered fly ash aggregate; sorptivity; split tensile strength; void ratio

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52) Satheeskumar, V.[a] , Subramani, T.[b] , Lakshumanan, C.[c] , Roy, P.D.[d] , Karunanidhi, D.[e]

Groundwater chemistry and demarcation of seawater intrusion zones in the Thamirabarani delta of south India based on geochemical signatures
(2021) *Environmental Geochemistry and Health*, 43 (2), pp. 757-770. Cited 40 times.

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[a] Department of Civil Engineering, Government College of Technology, Coimbatore, Tamil Nadu, India
[b] Department of Geology, CEG, Anna University, Chennai, Tamil Nadu, India
[c] Department of Remote Sensing, Bharathidasan University, Tiruchirappalli, Tamil Nadu, India
[d] Instituto de Geología, Universidad Nacional Autónoma de México, Ciudad Universitaria, Coyoacan, Mexico City, CP 04510, Mexico
[e] Department of Civil Engineering, Sri Shakthi Institute of Engineering and Technology, Coimbatore, 641062, India

Abstract
Sub-surface water samples from the delta of Thamirabarani River of south India were evaluated for human health risks and seawater intrusion using the geochemical signatures. Electrical conductivity (EC), total dissolved solids (TDS), pH and the concentrations of major cations and anions in 40 samples collected during the winter (January) and summer (July) of 2018 show comparable values. Subsequently, the results were verified with respect to the international drinking water quality standards. The piper trilinear diagram shows mixed Ca–Mg–Cl, Na–Cl, Ca–HCO3 and mixed Ca–Na–HCO3 facies in the samples. Similarly, the plenteous of cations are sequenced as Na+ > Ca2+ > Mg2+ > K+ and the plenteous of anions are sequenced as Cl− > SO42− > HCO3−>Br− > NO3− > PO4−. Gibbs plots illustrate that rock–water interaction and evaporation control the geochemistry of sub-surface water. More than 40% of the samples are unsuitable for drinking, and their higher EC and TDS values reflected the seawater intrusion, in addition to the anthropogenic activities (salt panning). Interrelationship between ions of sub-surface water was used to get a better insight into the saline water intrusion in the study area. To mitigate the river water salinization and seawater incursion in the aquifers, engineering solution such as weir construction across the Thamirabarani River near Mukkani village has been proposed. After construction of the weir, freshwater in the river can be diverted to the salt-affected and seawater-intruded areas to improve the scenario. © 2020, Springer Nature B.V.

Author Keywords
Drinking water quality; Geochemical signature; Seawater intrusion; South India; Thamirabarani delta

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53) Shaari, S.R.[a] , Othman, M.L.[a] , Hizam, H.[a] , Veerasamy, V.[a] , Dahlan, N.Y.[b] , Ramachandran, R.[c] , Chik, M.H.[d] , Anuar, S.Z.[d]

Optimal Ice Thermal Energy Storage Charging Operation of Chiller Plant during Off-peak Hours
(2021) *Journal of Mechanical Engineering*, 10 (Special Issue 1), pp. 159-170.

[a] Faculty of Engineering, Universiti Putra Malaysia, Selangor, Malaysia
[b] Faculty of Electrical Engineering, Universiti Teknologi Mara, Selangor, Malaysia
[c] Department of Electrical and Electronics Engineering, Government College of Technology, Coimbatore, India
[d] Engineering Division, Malaysia Nuclear Agency, Selangor, Malaysia

Abstract
A chiller plant (CHIP) consumes high electrical energy when high cooling thermal is required to be charged into ice thermal energy storage (ITES). This is because the electrical energy consumption of a chiller is proportional to cooling thermal. Therefore, this study aims to reduce energy consumption, E (kWh) of CHIP to charge ITES tank by using Linear Programming (LP). This technique may investigate the optimal operating period (OP) of chillers and other auxiliary equipment for ITES charge during the off-peak hour. Then, energy consumption, E (kWh) of CHIP resulted through this optimization technique support is compared to CHIP loading for ITES charge without using optimization technique. Results showed that energy saving of 11.25% was probably achieved by using optimization technique compared to ITES charging without using optimization technique. © 2021 School of Engineering, Universiti Teknologi MARA (UiTM), Malaysia.

Author Keywords
Chiller plant; Energy consumption; Ice thermal energy storage; Lp; Optimization technique

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54) Sivakumar, S.[a] , Thamaraiselvi, K.[b] , Prabha, D.[c] , Lakshmi Priya, T.[d] , Sung-Chul, H.[a] , Pyoung-In, Y.[a] , Seong-Ho, J.[a] , Jeong-Min, S.[a]

Vermicomposting: An efficient technology for the stabilization and bioremediation of pulp and paper mill sludge
(2021) *Cost Effective Technologies for Solid Waste and Wastewater Treatment*, pp. 209-217. Cited 1 time.

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[a] Department of Bioenvironmental Energy, College of Natural Resources and Life Science, Pusan National University, Gyeongsangnam-do, Miryang, South Korea
[b] Bharathidasan University, Tiruchirappalli, India
[c] Department of Environmental Sciences, Bharathiar University, Tamil Nadu, Coimbatore, India
[d] Department of Civil Engineering, Environmental Engineering Division, Government College of Technology, Coimbatore, India

Abstract
Sludge from various industries is an efficient source of plant nutrients. Disposal of these sludges is a major problem due to their production in large quantities. On the other hand, sludge holds a large amount of organic matter and nutrients, such as nitrogen, potassium, phosphorus, and calcium, and these components are not in forms that are immediately available to crops. Earthworms and microorganisms perform a major role in releasing these minerals from the sludge to the soil. Therefore, it has been suggested that vermicomposting by using earthworms might be an excellent method in the management of industrial sludge. Stabilization of the sludge by vermicomposting prior to soil application can affect the breakdown processes prior to application, providing a humus-rich, concentrated amendment with favorable physical and structural properties. Therefore, this review article discusses the stabilization of pulp and paper mill sludge, including pH, electrical conductivity, total nitrogen, organic carbon, and the removal efficiency of metals by vermitreatment methods. © 2022 Elsevier Inc. All rights reserved.

Author Keywords
C/N ratio; Earthworms; Metal removal; Pulp and paper mill sludge; Vermicompost

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55) Kasimani, R.

Studies on the Diesel Blends Oxidative Stability in Mixture with TBHQ Antioxidant and Soft Computation Approach Using ANN and RSM at Varying Blend Ratio
(2021) *Liquid Biofuels: Fundamentals, Characterization, and Applications*, pp. 543-611.

DOI: 10.1002/9781119793038.ch16

Department of Mechanical Engineering, Government College of Technology, Coimbatore, India

Abstract
Oxidation of biofuel affects the fuel quality heavily by an increase in the production of acids and other degradation products from the biofuels. This can be controlled by adding antioxidants for the biofuel to be oxidative stability by prolonging the storage. In this research, the experiments were conducted for performance and emission parameters in CI engine using ND, CIB5, CIB10, CIB15 and, CIB20 with and without the addition of antioxidant (1000ppm TBHQ) as fuel. The addition of TBHQ seems to perform better with lower BSFC and higher BTE with 12.5% and 2.9%, respectively. Also, CIB+TBHQ fuelled engine emission has increased CO, HC, NOx and decreased CO2 with 5%, 3%, 2.3% and 4%, respectively. NLRM was also developed for the CIB+TBHQ for easy prediction of the performance and emission parameters with a maximum absolute average error of 9.06% and minimum absolute error of 2.43%. An artificial neural network was also developed for CIB+TBHQ for predicting the performance and emission parameters with an RMSE value of 0.0255 and, 0.0133 MRE value of 1.71% and 1.62% as well as R-value of 0.97287 and 0.99858. © 2021 Scrivener Publishing LLC.

Author Keywords
Antioxidant additives; biofuel; neural network; oxidative stability; RSM

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56) Sivaraj, S.[a] , Rathanasamy, R.[a] , Kaliyannan, G.V.[b] , Thanigachalam, M.[c]

Perovskite Solar Cells
(2021) *Materials for Solar Energy Conversion: Materials, Methods and Applications*, pp. 107-131.

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[a] Department of Mechanical Engineering, Kongu Engineering College, Erode, Tamil Nadu, Perundurai, India
[b] Department of Mechatronics Engineering, Kongu Engineering College, Erode, Tamil Nadu, Perundurai, India
[c] Department of Mechanical Engineering, Government College of Technology, Coimbatore, India

Abstract
Renewable energy will compensate the futuristic energy demand, as non-renewable sources goes on decreasing day by day. The major renewable energy is utilized at present through photovoltaic cells. Silicon-based solar cells are readily available in market due to their longer stability and life span. However, other generation solar cells are engineered for obtaining improved performance and stability in the transition of laboratory to large-scale fabrication. Among all other solar cells, perovskite-based solar cells alone reported sudden improvement in efficiency from 14% in 2012 to 26.1% in 2020. In order to reach 25% efficiency, Si solar cells are taken an average of 40 years. In comparison with the Si solar cells, perovskite solar cells are lesser in weight, available at lower cost and non-toxic synthesis. These made the researchers to focus much more on perovskite-based solar cells. Organic lead halide perovskites are mostly used due to their physical and chemical stability and also easier availability. Slight modification in internal structures of perovskite might also have greater impact in overall performance in photoconversion process. Perovskite solar cells were employed in the applications of LEDs, photodetectors, solar cells, photoemitters, integrated circuit systems, photovoltaic cells, etc. © 2022 Scrivener Publishing LLC.

Author Keywords
fabrication techniques; perovskite materials; solar cell losses; Solar cells

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57) Prakash, R.[a] , Raman, S.N.[b] , Subramanian, C.[a] , Divyah, N.[c]

Eco-friendly fiber-reinforced concretes
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[a] Department of Civil Engineering, Alagappa Chettiar Government College of Engineering and Technology, Tamilnadu, Karaikudi, 630 003, India
[b] School of Engineering, Monash University Malaysia, Selangor, Bandar Sunway, Malaysia
[c] Department of Civil Engineering, Government College of Technology, Tamilnadu, Coimbatore, 641013, India

Abstract
Environmental sustainability and ecofriendliness are essential components of the present and future construction industry. Ecofriendly fiber-reinforced concrete is one example of sustainable solutions in the built environment. This chapter discusses on the development of ecofriendly fiber-reinforced concretes, with a special focus to the work undertaken by the authors on the behavior and performance of ecofriendly fiber-reinforced concretes produced with fly ash, a byproduct of thermal power plants, as a partial substitute for cement, and coconut shell, a discarded agricultural solid waste, as coarse aggregates, with the incorporation of manufactured fiber (steel fiber), and plant-based natural fibers (sisal and roselle fibers). The development process as well as the mechanical properties of the resulting ecofriendly fiber-reinforced concretes were studied. The findings showed that the manufactured and natural fibers revealed a promising result on the strength and mechanical characteristics of coconut-shell aggregate-based ecofriendly fiber-reinforced concretes.

Author Keywords
Concrete; Fiber-reinforced concrete; Fibers; Fly ash; Mechanical properties; Sustainability

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58) Sarangapani, E.[a] , Narmadhai, N.[b] , Kokila Vani, C.[a]

Computer-Aided Thermal Control System of 3L-ANPCI Using LabVIEW
(2021) *Springer Proceedings in Materials*, 5, pp. 1025-1034. Cited 1 time.

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[a] Department of Electrical Engineering, Bannari Amman Institute of Technology, Tamilnadu, Sathyamangalam, Erode, 638401, India
[b] Department of Electrical Engineering, Government College of Technology, Tamil Nadu, Coimbatore, 641013, India

Abstract
In this paper, computer-aided (IoT) thermal control system of three-level active neutral point clamped inverter (3L-ANPCI) was proposed using LabVIEW. The Internet of Things (IoT) allows objects to be sensed or remotely controlled through existing network, creating opportunities to incorporate the physical world more deeply into the computer-based system. In addition to reducing human intervention, this results in improved efficiency, reliability and economic benefit. In many applications such as a PV network, active neutral point clamped inverter is the most desirable inverter topology due to the

equal distribution of losses for switches. This topology helps the capacitors to achieve voltage balancing. The goal is to control the temperature of the junction and protect the system's uneven switching losses. LabVIEW is commonly used as an industrial monitoring and control system interface. Multisim can be used to co-simulate the three-level neutral point clamped inverter. The inverter input SPWM pulse can be supplied from LabVIEW to Multisim. The results of the simulation are confirmed by those derived from a mathematical calculation. The analysis of both tests verifies the reliability and validity of the IoT temperature monitoring from the specific IP address.

Author Keywords
ANPC inverter; Internet of Things (IoT); IOT control; Junction temperature; NPC inverter

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59) Nandakumar, N., Allwin Raja, T., Arunkumar, P.

Optimization of Process Parameters in Disc Plate Using Thermo-structural Analysis
(2021) *Springer Proceedings in Materials*, 5, pp. 165-173.

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Department of Mechanical Engineering, Government College of Technology, Tamil Nadu, Coimbatore, 641013, India

Abstract
The objectives of the present paper are to perform coupled field steady-state thermal analysis and static structural analysis by using ANSYS Workbench to evaluate the temperature distribution, total deformation and von Mises stress in the disc plate. Thickness of disc plate, diameter of hole and selection of material are selected as process parameters which affect the thermal and structural behaviour of disc plate. The fuzzy logic modelling is developed to model the output parameters such as temperature distribution, total deformation and von Mises stress in the disc plate. The rule-based fuzzy logic modelling is used in the present investigation. It is resulted that there is an error percentage of 0.2, 0.51 and 0.15 between fuzzy and FEA results such as temperature, total deformation and von Mises stress, respectively. It is ensured that the fuzzy logic modelling can be used for output responses in designing disc plate due to lesser error percentage. The optimization of process parameters such as thickness of disc plate, diameter of hole and selection of material is carried out using Taguchi analysis. It is obtained from the optimization results that thickness of disc plate (3 mm), diameter of hole (5 mm) and selection of material (grey cast iron) are the optimized process parameters which provide the minimum value of output responses such as temperature, total deformation and von Mises stress.

Author Keywords
Disc plate; Fuzzy logic modelling; Structural analysis; Taguchi method; Thermal analysis

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60) Premkumar, B., Nandakumar, N.

Implementing Biomimicric Owl Wing Pattern for Noise Reduction in Turbine Blade
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Department of Mechanical Engineering, Government College of Technology, Tamil Nadu, Coimbatore, 641013, India

Abstract
The objective of this project is to reduce the noise level which is coming out from the turbine blade in jet engine by implementing owl wing pattern. During the take-off and landing, the noises coming out from the jet engines cause noise pollution. It also provides the irritating to nearby houses, colleges, and schools. During testing of jet engines, the noises from the jet engines cause irritation to technical staff, workers, and it may cause damages to their ears. Model the turbine blade

by implementing the owl wing pattern and testing the noise level by modal, harmonic response, and harmonic acoustics analysis. This analysis gives the results in the form of sound pressure level (SPL) in dB. This experiment is modelled by the Catia V5R17. This analysis is done by Ansys 18.2. The comparison was made between the normal turbine blade and owl wing pattern turbine blade and the results are obtained from harmonic acoustics analysis. The SPL values are obtained from the normal turbine blade 143 dB which is greater than the owl wing pattern turbine blade 138 dB. Based on the SPL analysis, the serrated owl wing turbine blade is the best suitable design to reduce the noise which is coming out from the turbine blade.

Author Keywords
Biomimicry; Noise reduction; Owl wing pattern; Sound pressure level; Turbine blade

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61) Somasekaran, B.[a] , Thirunarayanaswamy, A.[a] , Palanivel, I.[b]

Synthesis of Graphene and fabrication of Aluminium-Grp nanocomposites: A review
(2021) *Materials Today: Proceedings*, 50, pp. 2436-2442. Cited 3 times.

DOI: 10.1016/j.matpr.2021.10.262

[a] Department of Mechanical Engineering, Government College of Technology, Coimbatore, 641013, India
[b] Department of Production Engineering, Government College of Technology, Coimbatore, 641013, India

Abstract
Graphene, a two-dimensional crystalline allotrope of carbon, has attracted the interest of a growing number of researchers due to its exceptional mechanical properties. Its higher optical transparency, superior thermal and electrical conductivity, and large specific area are all important characteristics that allow it to be used in a wide range of industries, including aircraft, electronics, newer materials, solar cells, and more. In this article, the various methods of graphene synthesis such as Mechanical Exfoliation, Chemical Vapor Deposition, Chemical Exfoliation, Liquid Phase Exfoliation and Epitaxial growth and the fabrication techniques of aluminium nanocomposites have been discussed. Even though graphene could be synthesized using various techniques, each one has its own set of advantages and disadvantages. This study examines and proposes one such approach to eliminate the problems with the traditional graphene production process. Further, the properties, structures, and Graphene-based aluminium Nanocomposites have been enumerated. Graphene could also be synthesized from agricultural waste to eradicate the problems in the conventional techniques and liquid metallurgy technique shall be used to produce aluminium-graphene nanocomposites.

Author Keywords
Aluminium nanocomposites; Graphene; Liquid metallurgy technique; Properties and characterization of graphene; Synthesis methods of graphene

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62) Arumugam, N.[a] , Shakthi Priya, M.[b] , Subramanian, S.[c]

SAPON approach: A new technique for Low Power VLSI Design
(2021) *IEEE 2nd International Conference on Applied Electromagnetics, Signal Processing, and Communication, AESPC 2021 - Proceedings*, . Cited 2 times.

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[a] Government College of Technology, Department of Computer Science Engineering, Coimbatore, India
[b] Government College of Technology, Department of ECE, Coimbatore, India
[c] Government College of Technology, Department of EIE, Coimbatore, India

Abstract
Nowadays, low power VLSI is an emerging discipline where high power consumption has become a key metric in VLSI design. High power dissipation is not regarded as good when it comes to battery lifespan in the case of battery-operated applications. It alters reliability, cooling costs, and also contributes to the reduction of battery life. Switching and short circuit leakage power play a significant role in the high-frequency dynamic transition of inputs. Several standard reduction techniques exist to reduce the power consumption of circuits. In this paper, we have scrutinized the source of power consumption in static and dynamic leakage power and introduced a new technique called the SAPON (Stackly Arranged low Power ON transistor) technique to mitigate the power reduction of circuits. We have utilized various CMOS logic circuits such as INVERTER, NAND, NOR, and MUX to implement these techniques and compared their total power consumption with the standard reduction techniques. We have examined the proposed SAPON technique along with conventional, LECTOR, LCNT, and STACK ONOFIC techniques to interpret the utility of SAPON in low-power VLSI and obtained results showing that SAPON consumes low power than standard reduction techniques. These circuits are simulated in Tanner EDA Tool with Generic 250 nm transistors. © 2021 IEEE.

Author Keywords
CMOS; Dynamic leakage power; LCNT; LECTOR; Low power consumption; SAPON; short circuit leakage; STACK ONOFIC; VLSI

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63) Karthik, M.[a] , Narmadhai, N.[b] , Thangaraj, R.[c] , Ramya, E.[d] , Rubia Gandhi, R.R.[a] , Abinaya, I.[a]

Evaluating the Crucial Qualities of Hybrid Esters for Transformer Applications
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[a] Sri Ramakrishna Engineering College, Department of Electrical and Electronics Engineering, Tamil Nadu, Coimbatore, 641 022, India
[b] Government College of Technology, Department of Electrical and Electronics Engineering, Tamil Nadu, Coimbatore, 641 013, India
[c] Coimbatore Institute of Engineering Technology, Department of Electrical and Electronics Engineering, Tamil Nadu, Coimbatore, 641 109, India
[d] Bannari Amman Institute of Technology, Department of Electrical and Electronics Engineering, Tamil Nadu, Sathyamangalam, 638 401, India

Abstract
Transformer is a renowned gadget in various applications of power system without which the entire life on earth will be exterminated. The major task of transformer is to offer the endless power to the society. The foremost problem figured out with transformer is the failure of insulation. Overall, two types of insulations like liquid and solid insulations are preferred for designing the transformer in which a good number problem deals with liquid insulation which causes degradation of solid insulation and affects the efficiency of transformers. In this manuscript the transformer based mineral oil along with various natural based esters being rape-seed oil, honge oil and neem oil are tested for various characteristics like break-down voltage, flashing point, firing point and viscosity. By this exertion, the superior compositions of natural esters-based hybrid oil for transformer applications are figured out. © 2021 IEEE.

Author Keywords
breakdown voltage; Insulation; natural esters; regression; transformer

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64) Periyasamy, S.[a] , Temesgen, T.[a] , Karthik, V.[b] , Isabel, J.B.[c] , Kavitha, S.[d] , Banu, J.R.[e] , Sivashanmugam, P.[f]

Wastewater to biogas recovery
(2021) *Clean Energy and Resource Recovery: Wastewater Treatment Plants as Biorefineries, Volume 2*, pp. 301-314. Cited 9 times.

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[a] Department of Chemical Engineering, School of Mechanical, Chemical and Materials Engineering, Adama Science and Technology University, Adama, Ethiopia
[b] Department of Industrial Biotechnology, Government College of Technology, Tamil Nadu, Coimbatore, India
[c] Department of Biotechnology, KIT-Kalaignarkarunanidhi Institute of Technology, Tamil Nadu, Coimbatore, India
[d] Department of Biotechnology, Adhiyamaan College of Engineering, Tamil Nadu, Hosur, India
[e] Department of Life Sciences, Central University of Tamil Nadu, Tamil Nadu, Neelakudy, India
[f] Department of Chemical Engineering, National Institute of Technology, Tamil Nadu, Tiruchirappalli, India

Abstract
The effect on climate change of greenhouse gases from fossil fuel combustion has increased the need for clean and renewable biological energies necessary for the future. A substitution for fossil-based fuels may be renewable biofuel biogas from wastewater (WW), which has the tremendous potential to meet energy demand and minimize greenhouse gas emissions. In green energy production technology, WW is wildly attracted to biogas recovery because it has environmental and economic benefits from domestic to industrial sectors. Owing to the growth of human lifestyles, urbanization, construction of WW treatment plants, and environmental legislation, the discharge of WW with high organic strength has increased enormously in recent decades. The organics present in the WW could be transformed into biogas through biological or biochemical processes and also, the contaminants could be alleviated. The knowledge of WW to biogas conversion is crucial to improve bioenergy production with a reduced operating economy.

Author Keywords
Anaerobic digestion; Biogas; Organic pollutants; Renewable energy; Wastewater

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65) Nithya, R., Thirunavukkarasu, A.

Recent Approaches in the Preparation of Various Biosorbents
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Department of Industrial Biotechnology, Government College of Technology, Tamilnadu, Coimbatore, India

Abstract
Biosorbents are biomass-based materials that are capable of translocating adsorbate molecules from the bulk liquid phase to their surfaces by means of preferential adsorption. These biosorbents are ample, biodegradable, and inexpensive; they generate minimal or no sludge; they have simple pretreatment methods and are easy to operate; and they have highly versatile or manipulable surface functional groups and constructive surface-related properties. Thus they have been identified as promising candidates for removing contaminants from wastewater. The physicochemical properties of these sorbents are usually dependent on the phytochemistry of the biomass and their pretreatment synthesis routes. In addition to these conventional classes, new-generation biosorbents are emerging that have tailor-made functional groups through surface modification approaches and are augmented with natural polymers using cross-linkers. Hence, research focusing on using various pretreatment methods in the development of novel biosorbents is increasing. This chapter is intended to comprehensively review the synthetic routes of such novel biosorbents and critically examine their adsorptive capability for removing heavy metal ions, dyes, and other organic contaminants from wastewater. Challenges in the functional integrity, regeneration potential, multi-contaminant removal capacity, scale-up ability, material toxicity, and disposal practices for spent biosorbents are collectively explored. Also, the feasibility of using recombinant strains technology with the potential constraints of random mutations, creation of superbugs, plasmid stability, and unsteady diffusional behavior at interfaces have been identified as focus areas for future research.

Author Keywords
Biosorbents; polymer crosslinking; surface modification; synthetic route; wastewater

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66) Thirunavukkarasu, A., Nithya, R.

Dynamic Biosorption for Removal of Wastewater Contaminants
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Department of Industrial Biotechnology, Government College of Technology, Tamilnadu, Coimbatore, India

Abstract
Biosorption is a separation process driven by the concentration gradient in which solute molecules are diffused into a biosorbent at the solid-liquid interface until equilibrium is attained. Among the conventional water treatment techniques, biosorption is highly efficient and cost-effective, as most of biosorbents are versatile and derived from recycled biomasses. The presence of specified functional groups and the ease of tailor-made modifications to the surface of the sorbents have attracted scientific researchers to exploit their potential for removing heavy metals and a wide range of organic compounds in batch- and continuous-mode operations. This chapter critically reviews the reported dynamic biosorption studies of the removal of various pollutants from wastewater. Further, it focuses on the influence of various operational parameters that significantly affect the breakthrough curves and thus the efficacy of the fixed-bed column studies. In addition, the findings from comparative investigations of batch and column biosorption studies are reported. Finally, challenges in using biosorbents - such as stability, reactivity, regeneration, fouling, etc. - and operational constraints - including diffusional resistance, channeling effects, temperature homogeneity, and the feasibility of a series of fixed-bed columns - are discussed.

Author Keywords
biosorbents; biosorption; fixed-bed studies; future challenges; wastewater treatment

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67) Thyagarajan, L.P.[a] , Jeyanthi, J.[a] , Kavitha, D.[b]

Vulnerability analysis of the groundwater quality around Vellalore-Kurichi landfill region in Coimbatore
(2021) *Environmental Chemistry and Ecotoxicology*, 3, pp. 125-130. Cited 6 times.

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[a] Government College of Technology, Coimbatore, India
[b] Department of Chemistry, Dr. M.G.R Educational and Research Institute, Chennai, Tamil Nadu, India

Abstract
Groundwater resources are explored and exploited to their maximum for the use in households, industries and other domestic activities. It becomes sensible to recognize its importance in quantity view point and take necessary measures to maintain its purity. The present study assesses the vulnerability of the groundwater resources to pollution due to the plume movement from the nearby landfill region of Vellalore-Kurichi village in Coimbatore. This gives better understanding of the groundwater pollution with the spatial maps outlined from the Arc GIS software. The physico-chemical parameters like pH, EC, resistivity, alkalinity, total hardness, total dissolved solids, turbidity, salinity, DO, BOD, COD, chlorides, sulphates, nitrates were analysed and the WQI values were derived from the above parameters to quantify the pollution potential in this area. The groundwater from Konavaikalpalayam, Aathumedu, Mettu-thottum and Rukmaniammal road are the most affected

by contamination. The plume movement is suspected towards the North and North-western side of the landfill region. This may be due to the presence of slope towards the North-western side of the landfill. The most of the samples come under the category of poor water and so the water is unfit for even domestic purposes. The results stresses the need for the local bodies to take necessary action to prevent contamination of the groundwater in this region by following a holistic approach to prevent further contamination. © 2021 The Authors

Author Keywords
Contamination; GIS; Groundwater; Plume movement; Spatial maps; Water quality index

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68) Gu, H.[a] , Guo, Z.[b] , Naik, N.[c] , Shetty, D.K.[d] , Hameed, B.M.Z.[e] , Chakraborty, U.K.[f] , Paul, R.[g] , Vanahalli, M.K.[h] , Srivastava, D.K.[i] , Gupta, A.[j] , Singla, B.[k] , Kumar, S.[l] , Aaydee, N.[m] , Liu, C.[n] , Hao, Q.[o] , Zhang, H.[p] , Patil, S.[q] , John, B.[r] , Karuppanan, S.[s] , Sun, L.[t] , Le, T.Q.[u] , Gurunathan, B.[v] , Muthukumaran, C.[w] , Sham Aan, M.P.[x] , Lu, N.[y] , Zhou, H.N.[z] , Manoharan, A.N.[aa] , Maddodi, B.[ab]

Frontiers of Advanced Sciences and Technologies: Results, Challenges and Perspectives
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[a] Shanghai Key Lab of Chemical Assessment and Sustainability, School of Chemical Science and Engineering, Tongji University, Shanghai, 200092, China
[b] Integrated Composites Laboratory (ICL), Department of Chemical and Biomolecular Engineering, University of Tennessee, Knoxville, TN 37996, United States
[c] Department of Mechanical and Manufacturing Engineering, Manipal Institute of Technology, Manipal Academy of Higher Education, Karnataka, Manipal, 576014, India
[d] Department of Humanities and Management, Manipal Institute of Technology, Manipal Academy of Higher Education, Karnataka, Manipal, 576104, India
[e] Department of Urology, Father Muller Medical College, Karnataka, Mangalore, 575002, India
[f] Department of Computer Science and Engineering, Sikkim Manipal Institute of Technology, Sikkim Manipal University, Sikkim, 737136, India
[g] Department of Radiation Oncology, Harvard Medical School, Boston, MA, United States
[h] Data Science and Intelligent Systems, Indian Institute of Information Technology, Dharwad, India
[i] Department of Information Technology, Manipal University, Rajasthan, Jaipur, India
[j] Apex Institute of Technology, Chandigarh University, Punjab, Mohali, 752101, India
[k] Chitkara Business School, Chitkara University, Chandigarh Tehsil, Rajpura, Punjab, Patiala, 140401, India
[l] Department of Computer Science and Engineering, Babu Banarasi Das University, Uttar Pradesh, Lucknow, 226028, India
[m] Bharti Vidyapeeth, Institute of Management and Research, New Delhi, 110063, India
[n] Division of Material Science and Engineering, Zhengzhou University Zhengzhou, China
[o] Department of Aerospace and Mechanical Engineering, The University of Arizona, Tucson, AZ, United States
[p] Institute of Engineering Thermophysics, Chinese Academy of Sciences, Beijing, China
[q] Department of Mechanical Engineering, Manipal University Jaipur, Rajasthan, Jaipur, 303007, India
[r] School of Mechanical Engineering, Vellore Institute of Technology, Tamil Nadu, Vellore, 632014, India
[s] Mechanical Engineering Department, Universiti Teknologi PETRONAS, Bandar Seri Iskandar, Perak32610, Malaysia
[t] Department of Chemical and Biomolecular Engineering, Institute of Materials Science, University of Connecticut, United States
[u] Department of Food Technology, School of Health Science, Hoa Sen University, Thành pho, Ho Chí Minh, Viet Nam
[v] Department of Biotechnology, St. Joseph's College of Engineering, Chennai, India
[w] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, India
[x] Department of Chemistry, R V College of Engineering, Karnataka, Bangalore, 560059, India
[y] School of Materials Engineering, Purdue University, West Lafayette, IN, United States
[z] Department of Civil and Environmental Engineering, University of Tennessee, Knoxville, United States

[aa] Department of Post-Graduate Studies and Research in Geology, Government College Kasaragod, Kerala, India
[ab] Department of Civil Engineering, Manipal Institute of Technology, Manipal Academy of Higher Education, Karnataka, Manipal, 576104, India

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69) Suganya, T.[a] , Rajendran, V.[b] , Mangaiyarkarasi, P.[c]

Parameters Extraction of the Double Diode Model for the Polycrystalline Silicon Solar Cells
(2021) *Communications in Computer and Information Science*, 1440 CCIS, pp. 47-55. Cited 3 times.

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[a] Government Polytechnic College for Women, Coimbatore, 441, India
[b] Government Polytechnic College for Women, Coimbatore, 442, India
[c] Government College of Technology, Coimbatore, 13, India

Abstract
In this paper, a dual diode model of solar powered photovoltaic is explored to improve the efficiency of generation transforming structures of solar photovoltaic force. The double diode model is simple and straightforward to produce and offers greater precision which allows a more precise prediction of the presentation of photovoltaic structures. The survey depends on the reading results and it is for this reason that the MATLAB device is used. The reconstructions are completed by the fluctuation of the different limits of the model such as the oriented solar radiation, the temperature, the value of the parasitic screen, the ideality factor of the diode and the quantity of solar cells also associated which serve to accumulate the photovoltaic cluster. An obvious demonstration will be conducted to analyze the impacts of these details on the productivity curve and resistance/voltage performance of the PV cell for explicit models. Characterizing another frontier (α), a practically best solution is suppressed for the I-V curve of the photovoltaic model, which is better than the conventional outlier model due to its high computational efficiency in the constant supply of photovoltaic meadow. © 2021, Springer Nature Switzerland AG.

Author Keywords
Open-circuit voltage; Output power; Parameters extraction; Short-circuit current; Solar cells

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70) Arunkumar, P.[a] , Muthukumaran, N.[a] , Muthu Samy, M.[b] , Prabhu, L.[a] , Rajeshwari, R.[c]

Investigation on effect of process parameters in abrasive Jet Machining process using full factorial design
(2021) *Materials Today: Proceedings*, 47, pp. 5395-5400.

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[a] Department of Mechanical Engineering, KPR Institute of Engineering and Technology, Coimbatore, 641407, India
[b] Department of Mechanical Engineering, Government College of Technology, Coimbatore, 641013, India
[c] Department of Bio Medical Engineering, KPR Institute of Engineering and Technology, Coimbatore, 641407, India

Abstract
Abrasive Jet Machining (AJM) process is one of the unconventional machining process used to cut various materials including soft and hard materials. Alumina and silica are majorly used as abrasive materials due to its chemical and abrasion resistance. In this paper, abandoned Ceramic Sanitary Ware (CSW) wastes are used as abrasive materials in AJM process. Since, CSW wastes contain major amount of alumina and silica compositions. Initially, ball milling machining process is carried out to convert CSW wastes into micro particles. Then, sieving is performed to segregate the particles with its size. Stand of distance, pressure and particle size are considered as most influencing parameters in AJM process.

Hence, Full Factorial design is utilized for three process parameters and three levels. The nozzle with a mixing chamber is designed and fabricated to perform drilling operation in the glass work piece. L27 experiments are carried out to evaluate Material Removal Rate (MRR) and Hole Diameter (HD) during drilling process of glass work piece. Further, the effect of each process parameters on MRR and HD is validated. From the analysis, it is found that pressure is most influencing parameters affecting MRR whereas HD greatly depends on particle size.

Author Keywords
Abrasive jet machining; Ball milling process; Ceramic sanitary ware; Full factorial design; Sieving

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71) Yasotha, S.[a] , Gopalakrishnan, V.[b]

Reliable energy preserving cluster-based routing policy with optimal route selection for wireless sensor networks
(2021) *International Journal of Enterprise Network Management*, 12 (3), pp. 221-238. Cited 3 times.

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[a] Faculty of ICE, Anna University, Chennai, India
[b] Department of Electrical and Electronics Engineering, Government College of Technology, Coimbatore, India

Abstract
Wireless sensor networks (WSNs) is one of the hottest research areas, owing to its wider applicability. Due to its effectiveness and inexpensiveness, most of the domains enjoy the benefits of WSN. However, WSN still combats with the major issue, which is energy efficiency. Though WSN is capable of performing numerous activities, the energy stringency controls the actual functionality of WSN. Energy conservation is the crucial requirement of WSN and this paper attempts to propose an energy preserving cluster-based routing policy for WSN. The underlying roots of the proposed approach are clustering approach and optimal route selection. The sensor nodes are clustered and the cluster leader is selected by means of trust level of the nodes. The optimal route selection is performed by cuckoo search algorithm. The performance of the proposed routing policy is analysed and evaluated in terms of packet delivery rate, latency, energy consumption and network lifetime. The proposed approach shows better network lifetime than the existing approaches.

Author Keywords
Energy conservation; Network lifetime; Routing; Wireless sensor networks; WSNs

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72) Somasekaran, B.[a] , Thirunarayanaswamy, A.[a] , Palanivel, I.[b]

Green synthesis of clean edge graphene nanosheets using natural precursor
(2021) *Materiale Plastice*, 58 (3), pp. 210-216. Cited 1 time.

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[a] Department of Mechanical Engineering, Government College of Technology, Coimbatore, 641013, India
[b] Department of Production Engineering, Government College of Technology, Coimbatore, 641013, India

Abstract
Graphene, a two-dimensional crystalline allotrope of carbon, has received greater attention from numerous researchers due to its excellent properties. Graphene could be produced by various techniques, each method has its advantages and disadvantages. In this research article, a novel method using agricultural waste rice husk as a precursor and chemical activation to produce few-layer graphene nanosheets was developed. Traditional approaches' significant shortcomings and the environmental concern of agricultural waste have been eliminated. The synthesized material was characterized using FESEM, Raman Spectroscopy, X-Ray diffractometer, UV-Vis absorbance and FTIR analysis. FESEM analysis of the surface

morphology revealed smooth edge few-layer graphene. The formation of sp2hybridized atoms can be seen in XRD spectra at 26.3 degrees. The C=C stretching bonds detected at 1612 cm-1wavelength are responsible for the graphitic structure.

Author Keywords
Characterization; Graphene; Green synthesis; Natural precursor

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73) Kalidass, J.[a] , Purusothaman, T.[b] , Suresh, P.[a c]

Enhancement of end-to-end security in advanced metering infrastructure
(2021) *Journal of Ambient Intelligence and Humanized Computing*, . Cited 4 times.

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[a] Department of Information Technology, Government College of Technology, Coimbatore, India
[b] Department of Electronics and Communication Engineering, Government College of Technology, Coimbatore, India
[c] Dept of ECE, Vel Tech Rangarajan Dr. Sagunthala R & D Institute of Science and Engineering, Chennai, 600062, India

Abstract
Advanced Metering Infrastructure (AMI) is enabling technology for smart grid and it act as a bridge between cyber and physical systems of the smart grid. The major parts of AMI are cyber systems; hence it's more vulnerable to attacks. The normal security protection scheme is not suitable for AMI because it consists of computation restricted components such as smart meters. The AMI networks also increase the challenges in the design of common protocol for end-to-end security (E2S) due to interoperability of its components. Data transfer in the AMI system requires E2S protection and security is one of the most challenging in AMI components development and deployment. Motivated by these limitations, the E2S scheme for AMI smart grid is proposed. In the proposed scheme includes the following properties. (i) Protracted publisher key per smart meter that are given by the Head End System (ii) Encryption key for each message sent from smart meter is derived from the publisher key (iii) Authentication of every message sent that consist of identity of smart meter such as Message Authentication Code (MAC). Compare with the existing end-to-end security schemes, the proposed scheme improves the E2S in terms of confidentiality, integrity and authentication with increasing scalability. © 2021, The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.

Author Keywords
Advanced metering infrastructure; Amalgamation; Cyber physical system; Group key management; Message authentication; Smart grid

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74) Devi, R.[a] , Shanmugalakshmi, R.[b]

Design of trust identification system for cloud services
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[a] Government College of Technology, Coimbatore, India
[b] Government College of Engineering and Technology, Karaikudi, India

Abstract
Cloud computing is merging into every aspect of our information exchange including our personal information, business environment and other environments along with numerous security and trust challenges. With rapidly developing cloud utilisation, the range of security issues and trust challenges also increases exponentially. Hence an efficient trust identification system (TIS) is needed to identify the region of trusted cloud service providers (CSPs) for a particular service.

In this paper, a novel trust identification technique is proposed based on linear programming using objective functions which can smartly spot the region of trust from the CSP pool. In this system, the cluster of trusted CSP is defined and the remaining CSPs are not recommended to the cloud customer (CC). The internet architecture is a wide area network with interoperability, scalability and durability. The analysis of the proposed system proves to be efficient in terms of accuracy and time complexity.

Author Keywords
Cloud computing; Cloud service provider; CSP; Linear programming; TIS; Trust identification system

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75) Ramesh, C.[a] , Sekar, M.[b]

Analysis of a black chrome coated copper absorber plate in a flat plate solar collector
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[a] Department of Mechanical Engineering, KIT-Kalaignarkarunanidhi, Institute of Technology, Coimbatore, Tamil Nadu, 641402, India
[b] Department of Mechanical Engineering, Government College of Technology, Coimbatore, Tamil Nadu, 641013, India

Abstract
With the depletion of conventional energy sources, the need for unconventional energy is focused on solar energy as it is avail plentiful. Converting solar energy into thermal energy is an effective way of utilizingsolar energy rather than the conversion of electrical energy. This paper compared the behavior of a solar collector at 30° and 45° angles with a black chrome coated absorber plate without and with glass reflectors. In view of the performance enhancement of the collector, the reflector was adjusted to maximize the incident ray for every hour. It was found that the collector fixed at a 30° inclination to the ground heats the water better, and again the performance can be increased by the reflector. © 2021, Canadian Science Publishing. All rights reserved.

Author Keywords
Black chrome coating; Copper absorber plate; Glass reflector; Sun tracking and tilt angle of collector

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76) Sumathi, S.[a] , Meiaraj, C.[b]

Lipid study from oleaginous yeast using sugarcane bagasse substrate
(2021) *Journal of Environmental Protection and Ecology*, 22 (3), pp. 1064-1071.

[a] Department of Civil Engineering, Government College of Engineering, Thanjavur, Tamil Nadu, India
[b] Department of Civil Engineering, Government College of Technology, Coimbatore, Tamil Nadu, India

Abstract
Global climate changes and alarming scarcity of fossil fuel stores for future use drive humanity’s feverish search for efficient alternatives to conventional fossil fuel sources. In this scenario, production of biodiesel from renewable plant sources is considered an eco-friendly alternative next to electric power. Standard, non-detoxified and detoxified sugar cane bagasse hydrolysate mediums are considered for the study. These media are prepared and made to interact with Rhodosporidium toruloides, an oleaginous yeast strain and their suitability for the production of microbial lipids through fermentation is studied. The results obtained for the three media establish that detoxified sugar cane bagasse hydrolysate can be used as a potential carbon source for the production of lipids using R. toruloides as it produces comparatively higher microbial oil yields than the other standard media. © 2021, Scibulcom Ltd.. All rights reserved.

Author Keywords
Biomass; Detoxification; Fermentation; Pre-treatment; Rhodosporidium toruloides

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77) Satheesh Kumar, P.[a] , Jeevitha[a b] , Manikandan[a b]

Diagnosing COVID-19 Virus in the Cardiovascular System Using ANN
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[a] Coimbatore Institute of Technology, Coimbatore, Tamil Nadu, India
[b] Government College of Technology, Coimbatore, Tamil Nadu, India

Abstract
The novel corona virus disease (COVID-19) is a deadly SARS- COV-2 communicable virus causing the world economy to crash. COVID-19, which causes interstitial pneumonitis and severe acute respiratory distress syndrome (ARDS), primarily affects the lungs multiple organs, especially the cardiovascular system. The ability of this virus to spread through human-to - human and surface-to-human transmission contributes to a devastating process in the world Biological signal analysis based on computer system allows medical officers to manage Covid-19 tasks such as intensive care ECG monitoring, fatal ventricular fibrillation, etc. The most common complications include heart dysfunctions such as tachycardia, bradycardia, ventricular fibrillation, cardiac arrhythmias, heart injury [highly responsive troponin I (hs-cTnI) elevation and creatine kinase, fulminant myocarditis, heart failure, pulmonary embolism, and disseminated intravascular coagulation (DIC). Mechanistically, SARS-CoV-2 binds to transmembrane angiotensin-converting enzyme 2 (ACE2), a homologue of ACE, after proteolytic cleavage of its S protein by a serine protease, to join type 2 pneumocytes, macrophages, perivascular pericytes, and cardiomyocytes. This can result in myocardial dysfunction and injury, endothelial dysfunction, plaque instability, microvascular dysfunction, and myocardial infarction (MI). In this research, for classification purposes, the heart pulse base signal and characteristics such as spectral entropy, largest lyapunov exponent, Poincare plot and detrended fluctuation analysis are extracted and presented. The Poincare plot RR intervals summarise the RR time series obtained in one image from an ECG, and the quantity of a time interval derives the HRV information length. The prediction of heart rate fluctuation due to Covid or other heart problems is made simpler by this study.The better accuracy level in diagnosing heart pulse irregularity using Artificial Neural network(ANN) is an integer value (0 to 4).The processing time for analyzing heart dysfunctionalties is 0.05 s using ANN. © 2021, The Author(s), under exclusive license to Springer Nature Switzerland AG.

Author Keywords
Artificial neural network; COVID-19; ECG; First return maps; Lyapunov exponent; Spectral entropy

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78) Anitha, D.[a] , Ramadevi, A.[b]

Modified mangosteen shell carbon in the removal of pb (Ii) and hg (ii) from aqueous solution – isotherm and kinetic studies
(2021) *Global Nest Journal*, 23 (1), pp. 112-118. Cited 2 times.

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[a] Department of Chemistry, Karpagam Institute of Technology, Coimbatore, 641105, India
[b] Department of Chemistry, Government College of Technology, Coimbatore, 641013, India

Abstract
An adsorbent was prepared from Mangosteen shell using sulphuric acid and sodium bicarbonate as modifiers. Bicarbonate treated mangosteen shell (BTMC) was characterized using FT-IR, SEM, EDAX and XRD data. The Freundlich adsorption

isotherm model gives a good fit. The maximum adsorption capacities of BTMC were found to be 58.48 mg g-1 and 49.75 mg g-1 for Pb (II) and. Hg (II). Adsorption of Pb (II) and Hg (II) followed pseudo-second-order kinetics. The adsorption mechanism was explained using the Weber and Morris's intra-particular diffusion process. Batch mode studies with synthetic wastewater suggest that BTMC can be efficiently used in wastewater treatment. © 2021 Global NEST.

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79) Mathanakeerthi, S.[a] , Sadheesh, S.[b] , Nandha Kumar, M.[b] , Gowtham, S.[b] , Manoj Kumar, V.[b]

Adsorption of endosulfan from aqueous solution using graphene clay matrix (GCM)
(2021) *Materials Today: Proceedings*, 45, pp. 5665-5671. Cited 5 times.

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[a] M.E. Environmental Engineering, Government College of Technology, Tamil Nadu, Coimbatore, 641013, India
[b] Department of Civil Engineering, Sri Krishna College of Engineering and Technology, Tamil Nadu, Coimbatore, 641008, India

Abstract
This study involves the adsorption of endosulfan, an organo-chlorine pesticide from aqueous solution using synthesized graphene clay matrix (GCM). Graphene was synthesized from Sucrose C12H22O11 at high temperature and pressure and embedded on the surface of clay to avoid liquid solid separation and was activated by 30% Conc. sulphuric acid. GCM was characterized by various instrumentations like Raman spectroscopy, Fourier transform infra - red spectroscopy (FTIR), thermo gravimetric analyzer (TGA), differential thermo analyzer (DTA). The peak range obtained in raman spectroscopy was 1000-1500 Cm-1 at G band and 2500 - 3500 at the 2D band. FTIR was analyzed for infrared spectral bonds of adsorbent and the C=N, C=C, C=O spectrum indicated Graphene. TGA showed the change of structural composition with respect to increase in temperature and DTA gave the heat evolution graph of graphene monomer respectively. The aqueous solution of endosulfan after adsorption was analyzed by batch and column adsorption methods by varying its concentration, contact time, quantity of adsorbent used, etc. and the favorable results were obtained for the removal efficiency of endosulfan from aqueous solution. The analyte solution was characterized by high performance liquid chromatography (HPLC) and the maximum removal efficiency obtained was 98% in batch studies and 94% in column adsorption method. This method of endosulfan removal will be one of the best methods for the degradation of organo-chlorine derivatives by harmless natural method in a cost-effective manner.

Author Keywords
Adsorption; Characterization; Degradation; Endosulfan; Pesticide; Sucrose

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80) Vignesh, S., Surendran, R., Sekar, T., Rajeswari, B.

Ballistic impact analysis of graphene nanosheets reinforced kevlar-29
(2021) *Materials Today: Proceedings*, 45, pp. 788-793. Cited 7 times.

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Department of Mechanical Engineering, Government College of Technology, Coimbatore, 641013, India

Abstract
The bulletproof vests used by law enforcement officials can be appropriately termed as "Bullet-resistant" vests instead of bulletproof vests since they are not completely threat proof. The bullets released from handgun calibers such as 0.357 SIG or 9 mm guns travel at a very high velocity which the vests cannot withstand. These vests are mostly made of ceramic or steel plates backed with para-aramids such as kevlar, spectra, and dyneema. Kevlar is an organic fiber from an aromatic polyamide family. Kevlar has a unique molecular structure that distinguishes it from other polyamide families. The para-aramid structure gives kevlar an optimum combination of high tensile strength, high modulus, resilience, thermal stability,

and toughness [1]. Different varieties of Kevlar are produced to be used in different applications. Kevlar-29 has been the most widely used material in bulletproof vests for ballistic protection. Despite its strength and resilience kevlar has its disadvantages such as poor compression strength, which makes it less reliable for ballistic protection. Although kevlar fibers are strong and have high tensile strength its ability to cope with the force of compression is poor [2]. Also, the inclusion of these plates significantly increases the weight of the jackets. Graphene, on the other hand, is a two-dimensional allotrope of carbon atoms arranged in a hexagonal lattice structure [3]. It is found to be the strongest material ever found yet weighs much less than a paper [4]. In this work, graphene nanoparticles are inserted as laminates in-between the kevlar fiber layers and dynamic ballistic impact analysis is done on this reinforced material. The equivalent stresses, total deformation, maximum principal stress and directional velocity of the vests and bullet are investigated and the results show a significant increase in the ballistic performance of vests reinforced with graphene laminates. Selection and peer-review under responsibility of the scientific committee of the International Conference on Advances in Materials Research - 2019.

Author Keywords
Ballistic impact; Bulletproof vests; Graphene; Kevlar-29

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81) Anitha, D.[a] , Ramadevi, A.[b] , Seetharaman, R.[c]

Activated Mangosteen shell in removal of mercury ion from aqueous solution
(2021) *Materials Today: Proceedings*, 45, pp. 658-662. Cited 2 times.

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[a] Department of Chemistry, Karpagam Institute of Technology, Coimbatore, India
[b] Department of Chemistry, Government College of Technology, Coimbatore, India
[c] Department of Electronics and Communication Engineering, CEG Campus, Anna University, Chennai, India

Abstract
The poisonous heavy metal mercury was removed from aqueous solution using bicarbonate treated mangosteen shell a biosorbent available at low cost. Batch experiments were performed to evaluate the parameters like contact time, pH, carbon dose on the removal efficiency of Hg (II) from aqueous solution. Scanning electron microscopy and Energy-dispersive X-ray spectroscopy analysis were carried out to study the surface morphology. Removal of mercury occurs at the optimum experimental condition at pH 5 and carbon dosage of 120 mg. Adsorption isotherm was evaluated using Langmuir, Freundlich and Temkin isotherm adsorption models. The Langmuir adsorption shows Q0 value of 49.75 mg g-1 for BTMC. Selection and peer-review under responsibility of the scientific committee of the International Conference on Advances in Materials Research - 2019.

Author Keywords
Adsorption; Aqueous solution; Isotherm; Mangosteen shell; Mercury

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82) Muthukumaran, N.[a] , Devaraj, P.[a] , Arunkumar, P.[a] , Sekar, T.[b]

Re-use of abandoned sanitary ware waste as abrasive particles for abrasive jet machine
(2021) *Materials Today: Proceedings*, 45, pp. 562-568. Cited 3 times.

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[a] Department of Mechanical Engineering, GCT Coimbatore, India
[b] Faculty of Mechanical Engineering, GCT Coimbatore, India

Abstract

In recent years, the growth in the machinery industries has emerged to produce the ceramic components which are non-bio degradable wastes. In this paper, the abrasive particles are produced through a rehash of ceramic sanitary ware wastes to machine the glass material in the abrasive jet machining process. Beforehand, computational fluid dynamics (CFD) analysis is performed on the nozzle to evaluate the flow velocity at the corresponding pressure distributions. It results that the velocity of 810 m/s is achieved at the outlet of the nozzle. The nozzle is designed based on the consequent results of flow analysis. Further, the sanitary ware wastes from washbasin urinals, sinks, bathtubs, toilets, etc are collected and renewed to the form of abrasive particles using sieving and segregation processes. The mixing chamber is fabricated and abrasive particles, dry air is made to mix in the mixing chamber. Then mixed particles are made to flow out to the working chamber through the outlet opening. The high jet velocity of the air and abrasive particle mixture has impinged through a convergent nozzle for machining the glass workpiece in the abrasive jet machining process. Moreover, the performance characteristics of abrasive particles in the abrasive jet machining process are evaluated. Selection and peer-review under responsibility of the scientific committee of the International Conference on Advances in Materials Research - 2019.

Author Keywords
Abandoned sanitary ware waste; Abrasive jet machining; Abrasive particles; Computational fluid dynamics; Material removal rate

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83) Karthik, M.[a] , Narmadhai, N.[b]

A survey on natural esters based insulating fluid medium for transformer applications
(2021) *Materials Today: Proceedings*, 45, pp. 2022-2028. Cited 4 times.

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[a] Department of Electrical and Electronics Engineering, Sri Ramakrishna Engineering College, Coimbatore, Tamil Nadu, 641 022, India
[b] Department of Electrical and Electronics Engineering, Government College of Technology, Coimbatore, Tamil Nadu, 641 013, India

Abstract
Insulating fluid priorities as an imperative part for the being expectancy of the electrical device such as transformer. A product of gasoline fuel like mineral oil has turned out to be overwhelming insulating fluid of t transformer for over several decades for its sublime cooling as well as dielectric properties. In any case, utilization of gasoline fuel like mineral oil, obtained as of a non-sustainable power basis, has impacted nature of its non-biodegradability characteristics. As a result, many authors guide their preference and priority for renewable and biodegradable choices. The various vegetable based natural fuel like Coconut oil, sunflower oil, rice bran oil, corn oil, soybean oil and so forth are well thought-out as contrasting options toward supplant mineral oil as insulating fluid of the electrical device such as transformer. This paper accords a latitudinous survey of various insulating fluid utilized in a transformer. The various research findings by the author has been inferred towards the superior quality renewable and biodegradable insulating fluid. Finally the qualities of natural esters (vegetable oil) to overcome the drawback of existing fluid is commented. Selection and peer-review under responsibility of the scientific committee of the International Conference on Advances in Materials Research - 2019.

Author Keywords
Biodegradability; Cooling property; Insulating fluids; Mineral oil; Renewable; Transformer

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84) Nivethitha, T.[a] , Palanisamy, S.K.[b] , Prakash, K.M.[c] , Jeevitha, K.[d]

Comparative study of ANN and fuzzy classifier for forecasting electrical activity of heart to diagnose Covid-19
(2021) *Materials Today: Proceedings*, 45, pp. 2293-2305. Cited 17 times.

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[a] Department of ECE, Hindusthan College of Engg. and Technology, Coimbatore, India
[b] Department of ECE, Coimbatore Institute of Technology, Coimbatore, 641014, India
[c] Department of ECE, V.S.B. Engineering College, Karur, India
[d] Department of EEE, Government College of Technology, Coimbatore, 641004, India

Abstract
Covid-19 is a dangerous communicable virus which lets down the world economy. Severe respiratory syndrome SARS-COV-2 leads to Corona Virus Disease (COVID-19) and has the capability of transmission through human-to-human and surface-to-human transmission leads the world to catastrophic phase. Computational system based biological signal analysis helps medical officers in handling COVID-19 tasks like ECG monitoring at Intensive care, fatal ventricular fibrillation, etc., This paper is on diagnosing heart dysfunctions such as tachycardia, bradycardia, ventricular fibrillation, cardiac arrhythmia using fuzzy relations and artificial intelligence algorithm. In this study, the heart pulse base signal and features like spectral entropy, largest lyapunov exponent, Poincare plot and detrended fluctuation analysis are extracted and presented for classification purpose. The RR intervals of Poincare plot summarize RR time series obtained from an ECG in one picture, and a time interval quantities derives information duration of HRV. This analysis eases the prediction of heart rate fluctuation due to Covid or other heart disorders. The better accuracy level in diagnosing heart pulse irregularity using Artificial Neural network(ANN) is an integer value (0 to 4)but for Fuzzy Classifier, it is 0.8 to 0.9.The processing time for analyzing heart dysfunctionalties is 0.05 s using ANN which is far better than Fuzzy classifier. © 2021 Elsevier Ltd.

Author Keywords
Covid-19; First return maps; HRV signal; Lyapunov exponent; Spectral entropy

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85) Srinivasan, V.P.[a] , Palani, P.K.[b] , Dhayananthan, S.[a] , Gopi, S.[a] , Balamurugan, S.[a] , Venkatesh, S.M.[c]

A Multi Criteria Decision Making (MCDM) based on TOPSIS and RSM for process improvement in electrical discharge machining of silicon nitride-titanium nitride ceramic composites
(2021) *Materials Today: Proceedings*, 45, pp. 1319-1327. Cited 5 times.

DOI: 10.1016/j.matpr.2020.05.436

[a] Sri Krishna College of Engineering and Technology, Coimbatore, Tamil Nadu, India
[b] Government College of Technology, Coimbatore, Tamil Nadu, India
[c] Shrinath Plants and Equipments, Coimbatore, Tamil Nadu, India

Abstract
This experiment is an attempt to choose the optimal machining parameters for electrical discharge machining (EDM) of silicon nitride-titanium nitride (Si3N4-TiN) ceramic composites based on MCDM approach. The electrical discharge machining have been conducted according to L21 orthogonal array with preferred input parameters like current (I), spark gap voltage (SV), pulse-on duration (Ton) and pulse-off duration (Toff). The response parameters measured are material eradication rate (MRR), electrode eradication rate (EWR) and surface roughness (Ra). The MCDM techniques namely Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) and Response Surface Methodology (RSM) are used to find the optimal machining parameters which provide better value of all responses. Also, scanning electron microscopy (SEM) is employed for examining the surface defects like micro-cracks, micro-pores, droplets, surface craters, globules, etc. © 2021 Elsevier Ltd. All rights reserved. Selection and peer-review under responsibility of the scientific committee of the International Conference on Advances in Materials Research - 2019.

Author Keywords
ANOVA; Current; Gap voltage; MCDM; RSM; TOPSIS

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86) Anitha, D.[a] , Ramadevi, A.[b] , Seetharaman, R.[c]

Biosorptive removal of Nickel(II) from aqueous solution by Mangosteen shell activated carbon
(2021) *Materials Today: Proceedings*, 45, pp. 718-722. Cited 15 times.

DOI: 10.1016/j.matpr.2020.02.748

[a] Department of Chemistry, Karpagam Institute of Technology, Coimbatore, India
[b] Department of Chemistry, Government College of Technology, Coimbatore, India
[c] Department of Electronics and Communication Engineering, CEG Campus, Anna University, Chennai, India

Abstract
The adsorption of heavy metal Ni (II) from aqueous solution by sulphuric acid modified agricultural byproduct mangosteen shell was studied. The effect of adsorbent dose, contact time, pH, on the removal efficiency of Ni (II) was evaluated by batch mode studies. At optimum experimental condition removal of nickel was observed at pH 5 and a carbon dosage of 60 mg. The surface morphology and functional groups were analyzed using FT-IR data and scanning electron microscope. Freundlich and Langmuir adsorption isotherm studies were performed. The adsorbent was noted to be economical and efficient in the removal of Ni (II) from aqueous solution. Selection and peer-review under responsibility of the scientific committee of the International Conference on Advances in Materials Research - 2019.

Author Keywords
Adsorption; Kinetics; Mangosteen shell; Nickel

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87) Franklin, S.B.[a] , Karthikeyan, I.[a] , Ramesh, K.[b]

Finite element modeling of energy storage materials alumina using heat recovery in packed pebble bed heat exchanger
(2021) *Materials Today: Proceedings*, 45, pp. 1872-1877. Cited 2 times.

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[a] Department of Mechanical Engineering, Sri Ramakrishna Institute of Technology, Coimbatore, Tamil Nadu, 641 010, India
[b] Department of Mechanical Engineering, Government College of Technology, Coimbatore, Tamil Nadu, 641 013, India

Abstract
The studies of thermal energy storage material Alumina (Al2O3) as a function of average bed temperature. Aluminum oxide is engineering properties and uses commercially available. Alumina is one of the most cost-effective and widely used materials in the family of ceramics. The raw materials, from which this high-performance technical grade ceramic is made aluminum oxide, commonly referred to as alumina high strength characteristics of the material. Aluminum oxide is used in the energy storage of heat exchanger. The Al2O3 pebbles are 6 mm to 14 mm and are randomly dumped and packed in a 450 mm long hollow tube of 45 mm inner diameter. The tube was fully covered the asbestos ropes to reduce the heat loss. Hot air from a source was used to flow in the packed bed at various inlet conditions of velocity varying from 2 to 3 m/s. The spheres were heated from an inlet temperature of 32 °C. The experimental work was done in the heat exchanger is given to air in the multistage compressor and diesel engine exhaust. Waste heat energy was stored in the pebbles. The experimental results indicated that the increased porous media temperature increased the outer surface temperature, increased the heat transfer rate with an increase in the average bed temperature of 342 K to 402 K. The entire results obtained by using experimentation were cross verified using Finite Element Analysis modeling. Finally the results of both experimental and Finite Element Analysis Modeling were found to be in good co-relation. Selection and peer-review under responsibility of the scientific committee of the International Conference on Advances in Materials Research - 2019.

Author Keywords
Alumina pebbles; Heat transfer; Pebble bed heat exchanger; Porous media; Sensible heat storage

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88) Veerasamy, V.[a] , Wahab, N.I.A.[a] , Othman, M.L.[a] , Padmanaban, S.[b] , Sekar, K.[c] , Ramachandran, R.[d] , Hizam, H.[a] , Vinayagam, A.[e] , Islam, M.Z.[a]

LSTM Recurrent Neural Network Classifier for High Impedance Fault Detection in Solar PV Integrated Power System
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[a] Advanced Lightning Power and Energy Research (ALPER), Department of Electrical and Electronics Engineering, Universiti Putra Malaysia (UPM), Seri Kembangan, 43400, Malaysia
[b] Department of Energy Technology, Aalborg University Esbjerg, Esbjerg, 6700, Denmark
[c] Department of Electrical and Electronics Engineering, Panimalar Engineering College, Chennai, 600123, India
[d] Department of Electrical and Electronics Engineering, Government College of Technology, Coimbatore, 641013, India
[e] Department of Electrical and Electronics Engineering, New Horizon College of Engineering, Bengaluru, 560103, India

Abstract
This paper presents the detection of High Impedance Fault (HIF) in solar Photovoltaic (PV) integrated power system using recurrent neural network-based Long Short-Term Memory (LSTM) approach. For study this, an IEEE 13-bus system was modeled in MATLAB/Simulink environment to integrate 300 kW solar PV systems for analysis. Initially, the three-phase current signal during non-faulty (regular operation, capacitor switching, load switching, transformer inrush current) and faulty (HIF, symmetrical and unsymmetrical fault) conditions were used for extraction of features. The signal processing technique of Discrete Wavelet Transform with db4 mother wavelet was applied to extract each phase's energy value features for training and testing the classifiers. The proposed LSTM classifier gives the overall classification accuracy of 91.21% with a success rate of 92.42 % in identifying HIF in PV integrated power network. The prediction results obtained from the proffered method are compared with other well-known classifiers of K-Nearest neighbor's network, Support vector machine, J48 based decision tree, and Naïve Bayes approach. Further, the classifier's robustness is validated by evaluating the performance indices (PI) of kappa statistic, precision, recall, and F-measure. The results obtained reveal that the proposed LSTM network significantly outperforms all PI compared to other techniques. © 2013 IEEE.

Author Keywords
discrete wavelet transform; high impedance fault; long-short term memory; recurrent neural network; Solar photovoltaic

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89) Mahendran, M.[a] , Periyasamy, S.[b]

Experimental research to predict optimistic nanoparticle additives graphene oxide (GO) diesel blend and optimistic operating condition by varying fuel injector holes
(2021) *Journal of Environmental Protection and Ecology*, 22 (1), pp. 277-289.

[a] Department of Mechanical Engineering, Sri Ramakrishna Engineering College, Coimbatore, India
[b] Department of Mechanical Engineering, Government College of Technology, Coimbatore, India

Abstract
In this article was investigated performance, combustion and emission by modifying the nozzle, (singles holes (modified), (3 holes (based) and (five holes). The tests were performed in four-stroke Kirloskar single-cylinder diesel engine-fueled by graphene oxide (30 ppm) at 1500 rpm, and the water-cooled direct injection diesel engine with an eddy current dynamometer has been maintained throughout the experiment at a standard injection timing at 240 bar is 23° BTDC (before Top Dead Centre). Three different nozzles from the results were noted. The impressive results in performance, combustion, and emissions (3 holes fuelled with diesel and 30 ppm of graphene oxide) are improved. The only drawback is that the

amount of NOx is increased due to complete combustion, with diesel and graphene oxide at 30 ppm.

Author Keywords
Brake specific fuel consumption; Brake thermal efficiency; Carbon monooxide; Cylinder pressure; Unburnt hydrocarbon

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90) Ranjith, B.B.[a] , Thenmozhi, R.[b]

Experimental and numerical studies on punching shear strength of concrete slabs containing sintered fly ash aggregates
(2021) *Revista de la Construccion*, 20 (1), pp. 15-25. Cited 4 times.

DOI: 10.7764/RDLC.20.1.15

[a] Department of Civil Engineering, PSNA College of Engineering and Technology, Dindigul, Tamil Nadu 624622, India
[b] Department of Civil Engineering, Government College of Technology, Coimbatore, Tamil Nadu 641013, India

Abstract
This paper presents experimental and numerical investigations on M30 grade of concrete containing 40% of sintered fly ash aggregates (SFAs) on the punching behaviour of reinforced concrete (RC) slabs. Two 1000 x 1000 x 100 mm reinforced concrete slabs were cast and subjected to punching tests. The experimental results were compared with creating a nonlinear finite element programme using ABAQUS. These 3D Finite element analyses were performed with the appropriate modelling of element size and the constitutive modelling of concrete. The material parameters of the damaged plasticity model in ABAQUS were calibrated based on the test results of the slab - plate connection. The comparison between experimental and numerical results indicates that the calibrated model correctly predicts the punching shear response of the slabs. A modification of 0.4 is introduced in MC2010 code. © 2021. All Rights Reserved.

Author Keywords
ABAQUS; finite element analysis; reinforced concrete slabs; sintered fly ash aggregates (SFAs)

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2-s2.0-85106655334

91) Padmanabhan, G.[a] , Shanmugam, G.K.[b] , Subramaniam, S.[a]

Shaking Table Tests on Liquefiable Sand Deposits Treated with Sand Compaction Piles
(2021) *Lecture Notes in Civil Engineering*, 138, pp. 523-532. Cited 1 time.

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[a] Geotechnical Engineering Division, Government College of Technology, Coimbatore, Tamil Nadu, India
[b] Geotechnical Engineering Division, CSIR—Central Building Research Institute, Roorkee, Uttarakhand, India

Abstract
Soil liquefaction and its associated ground failures during earthquake is one of the major hazards causing risk to life and infrastructures. Even though several literatures available using sand compaction pile (SCP) technique, investigations under sequential acceleration conditions for SCP-treated soil deposits were limited. Hence in this study, liquefaction resistance of sand treated with sand compaction pile under sequential acceleration conditions was performed and reported. For experimental studies, an acrylic tank having dimensions of 1.4 m × 1 m × 1 m was selected and mounted on uniaxial shaking table. Soil deposits having 600-mm depth were prepared with 40 and 60% relative density using sand pluviation method. For soil reinforcement, SCP having diameter 110 and 600 mm length was installed inside the soil deposit. Then, shaking table experiments were performed with and without improvement technique under sequential accelerations. For sequential acceleration, the selected accelerations are 0.1, 0.2, 0.3 and 0.4 g with 5 Hz frequency. Initially, the sand deposit was subjected to 0.1 g acceleration amplitude and generation of excess pore water pressure with time was continuously

monitored and recorded. After 0.1 g loading, the tank was left undisturbed for 24 h or until complete dissipation of generated pore water pressure whichever earlier. Then, next sequential loading of 0.2 g acceleration amplitude was applied and the same procedure was repeated up to 0.3 and 0.4 g testing conditions. The influence of various parameters affecting the performance of SCP improvement technique under sequential loading was compared and reported.

Author Keywords
Liquefaction; Nepal earthquake; Uniaxial shaking table

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92) Vijay, M.[a] , Sekar, T.[a] , Muthukumaran, N.[b] , Vijayakumar, K.[c]

Investigations on Electrochemical Discharge Machining of Al2O3 Ceramics
(2021) *Smart Innovation, Systems and Technologies*, 213 SIST, pp. 33-43.

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[a] Department of Mechanical Engineering, Government College of Technology, Coimbatore, Tamilnadu, India
[b] Department of Mechanical Engineering, KPR Institute of Engineering and Technology, Coimbatore, Tamilnadu, India
[c] Department of Mechanical Engineering, TPEVR Government Polytechnic College, Vellore, Tamilnadu, India

Abstract
The machining of ceramics materials in the conventional machining process is a tedious one. This research work attempts the investigations on electrochemical discharge machining (ECDM) used to material removal of ceramics such as aluminum oxide (Al2O3) with the working medium of the NaOH electrolyte. This machining method will be a better alternative method for industrial applications. The key effort of this work is to attain better material removal rate (MRR) and to minimize the overcut problem. The process parameters are selected for machining such as applied voltage, electrolyte concentration with three different levels. The results reveal that machining of ceramics can be done by electrochemical discharge machining, and the maximum material removal rate is obtained by using the higher concentration of electrolyte.

Author Keywords
Al2O3 ceramics; ECDM; MRR; NaOH electrolyte; Overcut

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93) Jeba, N.[a] , Rathi, S.[b]

Effective data management and real-time analytics in internet of things
(2021) *International Journal of Cloud Computing*, 10 (1-2), pp. 112-128.

DOI: 10.1504/IJCC.2021.113994

[a] Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore, 641049, India
[b] Department of Computer Science and Engineering, Government College of Technology, Coimbatore, 641013, India

Abstract
Integrating various embedded devices and systems in our socio-economic living environment enables internet of things (IoT) for smart cities. The underlying IoT infrastructure of smart and connected cities would generate enormous amount of heterogeneous data that are either big in nature or fast and real-time data streams that can be leveraged for safety and efficient living of the inhabitants. Real-time analytics on data enable to extract useful information from the voluminous data and provide information to users for decision making and help in feedback mechanism. In this paper, the effective

management of heterogeneous data and real-time analytics on data are studied. Data management deals with collecting and storing useful information to reduce manual tasks. Therefore, data management techniques should be consistent, interoperable and ensure reusability and integrity. We have explained the various architectures that can be used to deploy IoT in neural networks and the various streaming techniques for real-time analytics. Copyright © 2021 Inderscience Enterprises Ltd.

Author Keywords
Data management; Heterogeneous data; Internet of things; IoT; Real-time analytics

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94) Raghappriya, M.[a] , Kanthalakshmi, S.[b]

Fault Diagnosis of Nonlinear System Using Particle Filter
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DOI: 10.1007/978-981-15-8221-9_153

[a] Government College of Technology, Coimbatore, India
[b] PSG College of Technology, Coimbatore, India

Abstract
Fault detection and diagnosis (FDD) for nonlinear systems gains popularity due to its ability to distinguish faults in spite of very high nonlinearity of system dynamics. Increasingly in many application areas, it is important to include parameters of nonlinearity and non-gaussianity to accurately represent the innate dynamics of the physical system. Particle filtering (PF)-based FDD approach is designed to deal with the nonlinearity and non-gaussianity problems of system dynamics. The physical system chosen is a two degrees of freedom helicopter, and PF based approach is developed for various fault cases which includes sensor, actuator, and component faults. Results of various fault cases are presented which shows the identification of fault and time of occurrence of faults in the system. © 2021, Springer Nature Singapore Pte Ltd.

Author Keywords
Fault detection and diagnosis; Nonlinear systems; Sensor and actuator faults

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95) Kanthalakshmi, S.[a] , Wincy Pon Annal, A.S.[b]

Experimental Validation of Fuzzy SMC and Lyapunov Fuzzy SMC Over a Cylindroconical Fermenter
(2021) *Lecture Notes in Electrical Engineering*, 700, pp. 1599-1607.

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[a] PSG College of Technology, Coimbatore, Tamil Nadu, India
[b] Government College of Technology, Coimbatore, Tamil Nadu, India

Abstract
Fermenters are used in industries for the production of foodstuffs, alcoholic beverages, vaccines, and many others. Fermentation results in the formation of foam and release of gases. As the level of foam rises, it may enter the pump used to remove the gases produced and damage the pump. This results in shutdown of the process for cleaning and replacement of pumps, increasing the running cost. The main objective of this work is to reduce the running cost by controlling the level of foam. To achieve this goal, robust sliding mode controller with an equivalent control and a switching control is designed. The switching control is varied in two different ways, and the controller performance is analyzed. Lyapunov fuzzy sliding mode control is found to outperform fuzzy sliding mode control. This controller reduces the overshoot preventing foam from entering the pump, thus avoiding frequent replacement of pumps. © 2021, Springer Nature Singapore Pte Ltd.

Author Keywords
Cylindrocone; Fuzzy SMC; Lyapunov fuzzy SMC; Robust; SMC

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96) Rajasenbagam, T.[a] , Jeyanthi, S.[b] , Pandian, J.A.[c]

Detection of pneumonia infection in lungs from chest X-ray images using deep convolutional neural network and content-based image retrieval techniques
(2021) *Journal of Ambient Intelligence and Humanized Computing*, . Cited 41 times.

DOI: 10.1007/s12652-021-03075-2

[a] Department of CSE, Government College of Technology, Coimbatore, India
[b] Department of CSE, PSNA College of Engineering and Technology, Dindigul, India
[c] Department of CSE, Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology, Avadi, India

Abstract
In this research, A Deep Convolutional Neural Network was proposed to detect Pneumonia infection in the lung using Chest X-ray images. The proposed Deep CNN models were trained with a Pneumonia Chest X-ray Dataset containing 12,000 images of infected and not infected chest X-ray images. The dataset was preprocessed and developed from the Chest X-ray8 dataset. The Content-based image retrieval technique was used to annotate the images in the dataset using Metadata and further contents. The data augmentation techniques were used to increase the number of images in each of class. The basic manipulation techniques and Deep Convolutional Generative Adversarial Network (DCGAN) were used to create the augmented images. The VGG19 network was used to develop the proposed Deep CNN model. The classification accuracy of the proposed Deep CNN model was 99.34 percent in the unseen chest X-ray images. The performance of the proposed deep CNN was compared with state-of-the-art transfer learning techniques such as AlexNet, VGG16Net and InceptionNet. The comparison results show that the classification performance of the proposed Deep CNN model was greater than the other techniques. © 2021, The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.

Author Keywords
Content-based image retrieval; Data augmentation; Deep convolutional generative adversarial network; Deep convolutional neural network; VGG19Net

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97) Vignesh, S., Surendran, R., Sekar, T., Rajeswari, B.

Ballistic Performance Simulation of Graphene–Dyneema Multi-layered Armor
(2021) *Lecture Notes in Mechanical Engineering*, pp. 165-173. Cited 1 time.

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Department of Mechanical Engineering, Government College of Technology, Coimbatore, Tamil Nadu, India

Abstract
Dyneema (unidirectional bullet-resistant fiber) is a crucial ballistic ingredient for the finest life-protecting ballistic applications, protecting law enforcement officials and soldiers. Since dyneema requires material quantity much less than others to achieve a given performance and due to its high durability and long service life, it has been a prime option for ballistic material. Also, dyneema leaves the lowest carbon impression per unit tenacity. Dyneema-made vests have the ability to protect against a large variety of ballistic threats including a direct barrage from AK47 but fail when bullets from armor-piercing Type-V rifles like 0.30–0.06 Springfield or 0.50 caliber had a direct impact on the vests. On the other hand,

graphene is one of the strongest materials ever found having a single-atom-thick layer of 2D carbon atoms arranged in a hexagonal lattice. It exhibits properties like high tensile strength, thermal conductivity, toughness, stiffness, transparency and surface area. This high combination of a variety of properties is due to the covalent trigonal bonding of the carbon atoms arranged in sp2 hybridization. This study is a performance evaluation of graphene-sandwiched dyneema laminates against a 0.50 caliber using ANSYS 18.1. The resulting deformation of the armor laminates and stresses induced in the vest and bullet are studied and analyzed for improving the efficiency of the armors.

Author Keywords
Ballistic performance; Deformation; Dyneema; Equivalent stress; Graphene

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98) Hemalatha, B.[a] , Rajeswari, B.[a] , Sekar, T.[a] , Rajasekar, V.[b]

Experimental Studies on Biomachining of Copper and Its Behavioural Characteristics
(2021) *Lecture Notes in Mechanical Engineering*, pp. 49-56. Cited 1 time.

DOI: 10.1007/978-981-15-9809-8_4

[a] Department of Mechanical Engineering, Government College of Technology, Coimbatore, India
[b] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, India

Abstract
The methods being utilized for micromachining have adverse effect on the environment. They probably cause porosity, heat-affected zone and also damages the metallurgical properties. There have been severe effects due to chemicals on human health and environment. To achieve high efficiency, researches have evolved a new field in micromachining as biomachining. The fungal species of Aspergillus niger has been used for metal removal. The biomachining is done using the fungal culture on the workpiece of copper. The material removal rate was calculated. The microstructural analysis and hardness test were carried out. The colour change was also analysed. In this paper, the results of the samples before and after machining were compared.

Author Keywords
Aspergillus niger; Biomachining; Copper; Hardness; Material removal rate; Microstructural analysis

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99) Palani, P.K., Chithambaram, K., Rajeswari, B.

Optimization of Particle Size of Teak Wood Saw Powder Using Taguchi Method
(2021) *Lecture Notes in Mechanical Engineering*, pp. 409-421.

DOI: 10.1007/978-981-15-9809-8_33

Department of Mechanical Engineering, Government College of Technology, Coimbatore, Tamil Nadu, India

Abstract
Teak is a tropical wood species and placed in the flowering plant family Lamiaceae. It has a high degree of natural durability, moderately hard, excellent decay resistance, and good dimensional stability. The major applications of the teak wood are exterior and interior, indoor and outdoor furniture, ship decks. The major issue in wooden doors is that it absorbs moisture over a period of time and results in condensation where the stability gets decreased. Also during the high temperature season, the wood material undergoes expansion. But the wooden materials made from the micro-particles provide a greater

strength than made from the normal size particles. In this project, teak wood saw particles are collected as a waste material from wooden design door industry and the size of the particles is reduced in ball mill machine. Optimization of these wood particles involving the various factors was carried out by using Taguchi method. Then the micro-wood particles are finally obtained by using sieve. The results indicate that the samples obtained from the factors having speed 150 rpm, 18 numbers of balls, and a period of 2 h provides the optimum size.

Author Keywords
Ball milling; Optimization; Sieve analysis; Taguchi method and parameters; Windows

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100) Manikandan, V.[a] , Sikarwar, S.[b] , Yadav, B.C.[b] , Vigneselvan, S.[c] , Mane, R.S.[d] , Chandrasekaran, J.[e]

Ultra-sensitive behaviour of ruthenium-doped nickel ferrite thin film humidity sensor
(2021) *Journal of Experimental Nanoscience*, 16 (1), pp. 44-51. Cited 8 times.

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[a] Department of Physics, Kongunadu Arts and Science College, Coimbatore, India
[b] Nanomaterials and Sensors Research Laboratory, Department of Physics, Babasaheb Bhimrao Ambedkar University, Lucknow, UP, India
[c] Department of Physics, Government college of Technology, Coimbatore, India
[d] Center for Nanomaterial & Energy Devices, Swami Ramanand Teerth Marathwada University, Nanded, India
[e] Department of Physics, Sri Ramakrishna Mission Vidyalaya College of Arts & Science, Coimbatore, India

Abstract
Chemical sensors of homogenous particles, act as active centres, are envisaged for adsorption/desorption of water molecules. The adsorption/desorption of water molecules are lined up with surface of the sensor device. The sensor material was prepared via efficient chemical co-precipitation method. The ruthenium-doped nickel ferrite sensor endows ultra-sensitivity for humidity i.e. 4.04 and 4.37 4.04 MΩ/% relative humidity at low- and mid-range, respectively with rapid response/recovery time of 35/148 s.

Author Keywords
adsorption; desorption; ferrites; Humidity sensor; nanoparticles

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101) Stella, S.[a] , Mercyshanthi, R.[a] , Subramanian, K.[b]

Numerical behavior of sustainable beam column joints reinforced using hybrid fibers under reversed cyclic loading
(2021) *Journal of Green Engineering*, 11 (2), pp. 1549-1562.

[a] Karunya Institute of Science and Technology, Coimbatore, Tamil Nadu, India
[b] Government College of Technology, Coimbatore, Tamil Nadu, India

Abstract
The behavior of exterior beam column joints reinforced with hybrid fibers subjected to cyclic loading were studied analytically. The beam column joint is one of the most essential structural element and modeling such an element strengthened with hybrid fibers. Five specimens were casted using M60 grade designed using ACI method. The detailing was done according to IS 13920:1993.The specimens were tested under reversal cyclic loading and validated using abaqus

C3D8 elements for the structures and B31elements were used to model the reinforcement. The addition of hybrid fibers enhances the structural performance.

Author Keywords
Abaqus; Beam column joint; Cyclic loading; Hybrid fibers; Sustainable

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102) Kumar, M.[a] , Sujatha, S.[b] , Gokulan, R.[c] , Vijayakumar, A.[c] , Praveen, S.[d] , Elayaraja, S.[e]

Prediction of RSM and ANN in the decolorization of reactive orange 16 using biochar derived from ULVA lactuca
(2021) *Desalination and Water Treatment*, 211, pp. 304-318. Cited 14 times.

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[a] Department of Civil Engineering, Government College of Technology, Coimbatore, Tamil Nadu, 641 013, India
[b] Department of Civil Engineering, K. Ramakrishnan College of Technology, Trichy, Tamil Nadu, 621 112, India
[c] Department of Civil Engineering, GMR Institute of Technology, Rajam, Andhra Pradesh, 532 127, India
[d] Department of Civil Engineering, Anna University, University College of Engineering Ramanathapuram, Ramanathapuram Tamil Nadu, 623 513, India
[e] Department of Civil Engineering, PSG Institute of Technology and Applied Research, Coimbatore, Tamil Nadu, 641 062, India

Abstract
The present research compares the prediction of the response surface methodology (RSM) and artificial neural network (ANN) on the decolorization of Reactive Orange 16 (RO16) using a novel adsorbent produced from Ulva lactuca (seaweed). These mathematical models were designed based on four process conditions biochar dose, pH, temperature, and initial concentration. The experimental trials concluded that the dye removal of 93.10% was achieved at an optimum biochar dosage of 2 g/L, pH of 2, initial concentration of 0.5 mmol/L, and temperature of 40°C. The biochar characterization confirmed the presence of functional groups that are responsible for the adsorption of dye. The mathematical predictive model of RSM and ANN was compared with the experimental trials and a correlation coefficient (R2) of 0.95 is obtained for RSM, whereas a correlation coefficient (R2) of 0.99 was obtained for ANN. ANN prediction model was far better than RSM in the prediction of decolorization of Reactive Orange 16 (RO16) using U. lactuca as a novel adsorbent. The adsorp-tion isotherm studies concluded that four parameter model Fritz–Schlunder – IV and Marczewski– Jaroniec were found to best fit with a correlation coefficient of 0.9999. Pseudo-second-order kinetic model was found to best fit the experimental data. © 2021 Desalination Publications. All rights reserved.

Author Keywords
Artificial neural network; Biochar; Decolorization; Reactive Orange 16 (RO16); Response surface methodology

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103) Jambulingam, K., Ezhil, M.E.P., Karuppusamy, K.

Chromatographic separation of bioactive compounds of Leucas aspera (L) and larvicidal activity of Anopheles stephensi larvae
(2021) *Research Journal of Biotechnology*, 16 (1), pp. 53-60. Cited 2 times.

Department of Industrial Biotechnology, Government College of Technology, Coimbatore, Tamilnadu, 641013, India

Abstract
Malaria is a life-threatening disease caused by plasmodium parasites that are transmitted to people through the bites of infected female mosquito Anopheles stephensi. Medicinal plant Leucas aspera was selected to determine the larvicidal activity due to its potent pharmacological activity. The present study evaluates the bioactive components and larvicidal

potential of leaf extracts of Leucas aspera against Anopheles stephensi larvae. The bioactive components were identified using thin layer chromatography (TLC). Larvicidal efficacy was studied with different concentration of Leucas aspera leaf extracts against Anopheles stephensi. The yield of leaf extract was 45%, 21.25%, 37.2% for ethanol, distilled water and hexane solvents respectively. The presence of phytochemicals was higher in ethanolic leaf extract rather than water and hexane extract. The phytochemical screening showed the presence of tannin, phlobatanins, steroids, saponin, terpenoids, phenol, glycosides, mentione, terpene alcohol, sterol and quercertin. The LC50 and LC90 for the Leucas aspera ethanolic extract against the 4th instar larvae after 24hrs of incubation were 24.08 ppm and 168.96 ppm respectively and after 48hrs of exposure 51.67 ppm and 189.46 ppm respectively. It is clearly evident from the study that the ethanolic leaf extract of Leucas aspera will probably function as an eco-friendly vector controlling agent.

Author Keywords
Anopheles stephensi; Eco-friendly larvicides; Larvicidal activity; Leucas aspera; Phytochemicals

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104) Padmanabhan, G.[a] , Shanmugam, G.K.[b] , Subramaniam, S.[a]

Sustainability Approaches in Ground Improvement Measures
(2021) *Lecture Notes in Civil Engineering*, 79, pp. 249-255. Cited 1 time.

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[a] Government College of Technology, Coimbatore, India
[b] CSIR–Central Building Research Institute, Roorkee, India

Abstract
This paper presents an overview of sustainability approaches followed in ground improvement techniques. A review on research works performed in ground improvement techniques such as solar prefabricated vertical drains and microbial induced partial saturation and the way these techniques promotes the global sustainability. The tools used for evaluating the sustainability applicable to ground improvement are discussed and a comprehensive review is done for the research studies performed in ground improvement which contributes to the sustainable development. Accordingly, multi criteria-based sustainability evaluation framework consisting of Environmental Impact Assessment, Life Cycle Cost and Life Cycle Assessment was reviewed and its contribution towards global sustainability was presented. By estimating sustainability index through detailed sustainable assessment and evaluation, new and innovative ground improvement measures can be developed which enable global sustainability and eco-friendly geotechnical engineering. Also in this paper, the sustainable ground improvement developments in India and abroad are presented through available case studies.

Author Keywords
Case studies; Eco-friendly; Environmental impact assessment; Ground improvement techniques; Sustainability

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105) Bagavathi, C., Saraniya, O.

Classification by learning of wavelet and texture features
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Department of Electronics and Communication Engineering, Government College of Technology, Coimbatore, 641013, India

Abstract

Image classification is one among the significant tasks that can benefit industry through advancement in science and technology. Texture images possess a specific pattern that can be utilized to uniquely identify a texture class. Classification of Texture images can be done through proper selection of parameter that uniquely identifies an image in a group containing images of different classes. Machine learning approaches are currently the choice of implementation to provide accuracy and robustness in various fields like automatic image recognition, registration, and analysis. This work addresses machine learning methods to classify learnt texture samples through feature fusion of parameters obtained through wavelet and texture analysis. © Springer Nature Singapore Pte Ltd 2021.

Author Keywords
Gray level co-occurrence matrix; Haar wavelets; K-Nearest neighbor classifier; Support vector machines; Texture analysis

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106) Sreeja, G., Saraniya, O.

Energy efficient multifocus image fusion in dct domain
(2021) *Advances in Intelligent Systems and Computing*, 1163, pp. 713-718.

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Department of ECE, Government College of Technology, Coimbatore, 641013, India

Abstract
Fusion of multifocus images in discrete cosine transform (DCT) domain has been extensively exploited in recent years due to low complexity. In particular, the fusion by DCT is useful in visual sensor networks (VSN), where the images have to be transferred in coded format. Many research works have been done by combining spatial domain methods in DCT domain. In the proposed work, the energy of correlation coefficient in DCT domain is chosen as fusion criteria. The method works by evaluating the focus measurement between the input images and Laplacian-based sharpened images in DCT domain. The results obtained by the proposed method are compared in terms of objective metrics and the results show that the proposed work avoids inappropriate block selection which exists in available methods. © Springer Nature Singapore Pte Ltd 2021.

Author Keywords
Consistency verification; DCT; Energy of correlation coefficient; Image enhancement; Multifocus image fusion

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107) Selvakumar, P.[a] , Karthik, V.[b] , Kumar, P.S.[c] , Asaithambi, P.[d] , Kavitha, S.[e] , Sivashanmugam, P.[f]

Enhancement of ultrasound assisted aqueous extraction of polyphenols from waste fruit peel using dimethyl sulfoxide as surfactant: Assessment of kinetic models
(2021) *Chemosphere*, 263, art. no. 128071, . Cited 27 times.

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[a] Department of Chemical Engineering, School of Mechanical, Chemical and Materials Engineering, Adama Science and Technology University, Adama, 1888, Ethiopia
[b] Department of Industrial Biotechnology, Government College of Technology, Coimbatore, Tamil Nadu 13, India
[c] Department of Chemical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Chennai, 603 110, India
[d] Department of Water Supply and Environmental Engineering, Faculty of Civil and Environmental Engineering, Jimma Institute of Technology, Jimma University, Jimma, Ethiopia
[e] Department of Biotechnology, Adhiyamaan College of Engineering, Krishnagiri, Tamil Nadu 635130, India
[f] Department of Chemical Engineering, National Institute of Technology, Tiruchirappalli, Tamil Nadu 620015, India

Abstract
Pomegranate peel, a major waste from the food processing industries containing biologically active compounds, could be converted into value-added products having medicinal properties. Present study deals with the ultrasound-assisted surfactant, namely dimethyl sulfoxide (DMSO) aided polyphenolics extraction from pomegranate peel waste using double distilled water (DDW) as a solvent. Maximum total yield of extraction and total polyphenolic content (TPC) were found respectively to be 43.58 ± 1.0 and 49.55 ± 0.8%, at optimized sonication parameters viz. temperature 50 °C, power density 1.2 W/mL and time 40 min followed by surfactant aided extraction under optimum conditions 0.6% DMSO, 50 °C and 150 rpm for 90 min. Kinetic models were developed to determine the polyphenolics concentration and validated. GC-MS analysis of the extract revealed 22 phenolic compounds. Thus, the acquired results have ensured the significance of ultrasound pre-treated surfactant aided extraction of polyphenolic compounds and this process can be developed for commercial production. © 2020 Elsevier Ltd

Author Keywords
GC-MS; Kinetic study; Organic solid waste; Polyphenolic compounds; Surfactant; Ultrasound aided extraction

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108) Prakash, R.[a] , Thenmozhi, R.[b] , Raman, S.N.[c] , Subramanian, C.[a] , Divyah, N.[b]

An investigation of key mechanical and durability properties of coconut shell concrete with partial replacement of fly ash
(2021) *Structural Concrete*, 22 (S1), pp. E985-E996. Cited 38 times.

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[a] Department of Civil Engineering, Alagappa Chettiar Government College of Engineering and Technology, Karaikudi, India
[b] Department of Civil Engineering, Government College of Technology, Coimbatore, India
[c] Department of Architecture and Built Environment, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia, Bangi, Malaysia

Abstract
This study investigated the effect of adding fly ash on the mechanical and durability characteristics of coconut shell (CS) concrete. Two different mixes were developed, one with CS and the other with conventional aggregate and CS as coarse aggregate. Cement was replaced with Class F fly ash in terms of weight at 0, 10, 20, and 30% in both mixes. Test result showed that the CS concrete with 10% fly ash replacement level exhibited the highest compressive and tensile strength. The addition of fly ash decreased the porosity of CS concrete due to its fineness and increased hydration products in the matrix at later ages. Additionally, it also improved the weak aggregate interfacial transition zone of CS lightweight concrete. Thus, the fly ash addition in CS concrete showed lower values of water absorption, permeable voids, sorptivity, and chloride permeability. Furthermore, the increasing content of fly ash addition improved the durability characteristics of CS concrete considerably. © 2020 fib. International Federation for Structural Concrete

Author Keywords
agricultural wastes; concrete; durability; industrial by product; sustainability

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109) Paramasivam, B.[a] , K, R.[a] , R, S.[b]

Investigation and improvement on storage stability of pyrolysis oil obtained from Aegle marmelos de-oiled seed cake
(2021) *Energy Sources, Part A: Recovery, Utilization and Environmental Effects*, 43 (8), pp. 953-967. Cited 14 times.

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[a] Department of Mechanical Engineering, Government College of Technology, Coimbatore, India
[b] Department of Mechanical Engineering, Amrita School of Engineering, Ettimadai, India

Abstract
This study focuses on the effects of commercially available natural and synthetic antioxidants on the fuel stability of Aegle marmelos pyrolysis oil blends. Bio-oil was obtained from Aegle marmelos de-oiled seed cake in a pyrolysis reactor at 600ºC temperature. Characterization of pyrolysis oil blends regarding fuel stability was assessed by FT/IR by analyzing the band regions of C-H bonds. TBHQ dosage with bio-oil/diesel blend (F20D) augments the oxidation stability of 22.33%, and thermal stability of 27.05% when compared with pure pyrolysis oil/diesel blend (F20). The F20D was spectacles the superior fuel stability as compared with other blends. © 2020 Taylor & Francis Group, LLC.

Author Keywords
Aegle marmelos bio-oil; natural antioxidant; oxidation stability; synthetic antioxidants; thermal stability

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110) Choksi, H.[a] , Pandian, S.[a] , Arumugamurthi, S.S.[b] , Sivanandi, P.[c] , Sircar, A.[a] , Booramurthy, V.K.[b]

Production of biodiesel from high free fatty acid feedstock using heterogeneous acid catalyst derived from palm-fruit-bunch
(2021) *Energy Sources, Part A: Recovery, Utilization and Environmental Effects*, 43 (24), pp. 3393-3402. Cited 17 times.

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[a] School of Petroleum Technology, Pandit Deendayal Petroleum University, Gandhinagar, India
[b] Department of Petrochemical Engineering, RVS College of Engineering and Technology, Coimbatore, India
[c] Department of Mechanical Engineering, Government College of Technology, Coimbatore, India

Abstract
A novel solid acid catalyst was prepared from the palm-fruit-bunch by in-situ incomplete sulphonation carbonization method. The prepared catalyst was characterized to determine its physical and chemical properties which are determine its performance in a reaction. The catalyst was then subjected to esterification and transesterification reactions to produce biodiesel from high free fatty acid (FFA) Calophyllum inophyllum (C. inophyllum) oil. An optimum yield of 88.5 wt% methyl ester was achieved at 4 wt% of catalyst, methanol to oil molar ratio of 21:1 and a reaction temperature of 60ºC in 180 min. The fuel properties of the biodiesel were analyzed as per ASTM standard methods, and their properties were found to be in accordance with ASTM D6751. © 2019 Taylor & Francis Group, LLC.

Author Keywords
biodiesel; Calophyllum inophyllum; optimization; palm-fruit-bunch; solid acid catalyst

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111) Jothin, R.[a] , Vasanthanayaki, C.[b]

High Performance Error Tolerant Adders for Image Processing Applications
(2021) *IETE Journal of Research*, 67 (2), pp. 205-216. Cited 15 times.

DOI: 10.1080/03772063.2018.1535920

[a] Department of Electronics and Communication Engineering, KGiSL Institute of Technology, Coimbatore, India
[b] Department of Electronics and Communication Engineering, Government College of Technology, Coimbatore, India

Abstract
In this paper, we proposed High Performance Error Tolerant Adders (HPETA) which have an efficient design and quality

metrics for inexact computing applications. To achieve high performance, Multiplexer Based Approximate Full Adders (MBAFA) are proposed in the inaccurate part of the HPETA design. High speed, energy and area efficiency have been achieved by the critical path delay reduction and the number of gate-level logic reduction. The performances of the proposed MBAFA and HPETA are investigated by comparing its speed, area, power and accuracy parameters with those of other existing error tolerant adder structures. The investigation of these designs is performed in the Cadence Encounter software using the Application Specific Integration Circuits (ASIC) TSMC 90-nm technology library. From the Simulation results, the proposed MBAFA-I based HPETA-I adder exhibits high speed, area efficiency, low power consumption, less Area-Delay Product (ADP) and 56.25%, 47.98%, 37.58%, 34.03%, 39.32% lesser Power-Delay Product (PDP) than the existing conventional CSLA, SAET-CSLA, ETCSLA, HSETA, HSSSA, respectively. © 2021 IETE.

Author Keywords
Approximate; Energy efficiency; FPGA; High speed; HPETA; MBAFA; Multiplexer; PSNR

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