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3.4.6.1	Total number of books and chapters in edited volumes / books published, and papers in national/international conference-proceedings year wise during the last five years

Supporting Documents

1	Books and Chapters in Edited Volumes , Books Published, and Papers in National/International Conference Proceedings **(Year : 2020)**

Faculty of Technology & Engineering

10th International Conference of Materials Processing and Characterization

Edited by Swadesh Kumar Singh, Esther Titilayo Akinlabi, Kaushik Kumar, J. Paulo Davim, Kuldeep Kumar Saxena
Volume 26, Part 2,
Pages 173-3326 (2020)

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GMAW cladding on metals to impart anti-corrosiveness: Machine, processes and materials

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Experimental investigation of wettability properties for zirconia based coatings by RF magnetron sputtering

Kamlesh V. Chauhan, Dattatraya G. Subhedar, Riddhi Prajapati, Divyeshkumar Dave

Pages 2447-2451

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Experimental investigation of wettability properties for zirconia based coatings by RF magnetron sputtering

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ABSTRACT

Zirconia (Zirconium oxide) thin films were deposited on silicon and corning glass substrates by physical vapor deposition technique. In this experiment the influence of substrate temperature was investigated. The structural and Wettability properties characterized by X-ray diffraction (XRD), Atomic force microscopy and contact angle measurement system. The zirconia films crystallized in the monoclinic phases with (111) orientation, for different sputtering parameters. Average grain size found to be in range of 10–19 nm for different temperature. Surface roughness increases with change in substrate temperature. The surface energy and contact angle measured by contact angle measuring system, exhibited hydrophobic behaviour of zirconium oxide thin films.

Selection and peer-review under responsibility of the scientific committee of the 10th International Conference of Materials Processing and Characterization.

1. Introduction

Surface engineering consists of mainly two branches, first is coatings and second is surface modification. Surface modification is the phenomena changing the surface of a material by bringing physical, chemical or biological characteristics diverse from the ones originally found on the surface of a material. Thin films are thin coating with thickness ranging from fractions of a nanometer to several micrometers grown on substrate. Thin films play a vital role in virtually every micro- and nanostructure. Thin films made by a variety of means. Over the years various processes have been developed for the deposition of metal oxide thin films. A thin film consists of one homogeneous composition, crystalline phase composition and microstructure, or have an inhomogeneous multilayer or composite structure. e.g. Antiglare coatings for eye glasses. In Many industries there are many occasions when the properties demanded for an engineering application involves different features that are different for the surface than that are for the bulk. Moreover, rare material like Zirconium, Tantalum, Niobium, Vanadium, etc. are too costly to use directly for a specific application. Hence to reduce the cost and to get desired property from this rare material, the technique used is deposition of thin film or coating. In the recent, the coatings techniques are classified into two different ways, physical vapor deposition (PVD) and chemical vapor deposition (CVD). Comparing this two different coatings techniques cannot control stoichiometry of coating using more than one material because different materials have different evaporation rates [1]. Jameel (2015) studied different thin film deposition processes and concluded that PVD is the most efficient method [2]. Mahendra kumar (2015) also concluded that sputtering technique is reliable for development of coating for polycrystalline [3]. Likewise, as per the analyses of numerous research for fabrication of coatings PVD is more promising than CVD coating. Also, PVD is used to increase oxidation resistance, hardness and resistance of wear for the application of automotive, aerospace, surgical/medical, dies and shapes for all types of material processing, cutting tools.

Zirconia coatings has been many industrial application like thermal barrier coatings, optical filters, laser mirrors, alternative gate dielectrics in microelectronics, a buffer layer or a high temperature ceramic superconductor on Si, high temperature oxygen separation, oxygen sensors and fuel cells due to its heat resistance, low thermal conductivity, a relative high dielectric constant, high refractive index, high transparency in the visible and near infrared region, extreme chemical inertness, and a high laser damage threshold [4,5]. Hence certain parameters need to be maintained to achieve desirable properties those are suitable for application.

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A.V. Vyas, V.S. Ayar, M.P. Sutaria

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Optimization of surface roughness in EDM of pure magnesium (Mg) using TLBO

Soni Kumari, Pankaj Sonia, Bharat Singh, Kumar Abhishek, Kuldeep K. Saxena

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ABSTRACT

During investment casting of Magnesium alloys, the melt contacts with ceramic mould after pouring. The surface quality of the casting is directly affected by the wettability between the melt and ceramic mould material as the Mg melt is reactive to oxygen and moulds are mainly made of ceramic oxides. As the melt wets the wall of ceramic mould, the melt can infiltrate into ceramic mould through the capillaries on the mould surface and then metal can penetrate in the mould that may results in poor surface finish on the surface of the casting. When the temperature of casting and alloy composition fulfill the thermodynamic conditions of interfacial reaction, reaction occurs between melted metal and ceramic materials, leading to development of reactive layers on the surface of casting and deteriorating the surface quality of the casting. Therefore, there is great interest in the industry to minimize or elimination of interface reaction. Ceramic oxides with higher thermal stability found to resist the reactions to some extent. Use of protective gas also helps to overcome the reaction. Wettability has significant effect on the resultant interfacial properties of casting at high temperature liquid metal/solid ceramic systems. The present research focused on mould materials and mould development for suppression of mould-metal reaction in investment castings of magnesium alloy AZ91. An attempt was made to evaluate wetting kinetics for two different mould materials which are Zircon Flour and Fused Alumina. XRD analysis was done on the surface of Mg AZ91 and mould material to find the reaction products for the casting with both mould materials. Fused Alumina was found more suitable over conventional zircon flour for suppressing reaction based on the contact angle and surface roughness.

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1. Introduction

An excellent mechanical property at reduced weight of magnesium alloys demands the development of its castings for automobile and aircraft applications. Investment casting process is the most preferable for producing near net shape precision components for this type of applications.

Higher reactivity of magnesium with oxygen at elevated temperature restricts its processing through investment casting as ceramic oxides based mould materials reacts with Mg melt. These reactions at interface of mould and metal deteriorate the surface properties of casting. Modification is needed in conventional investment casting process for successful production of quality magnesium castings.

In US the increased use of Mg casting in automotive pushes the casting shipments to historic heights in 2007–2008. In 2008, 121,000 tons of Mg castings were produced in the US for all market segments with projections showing growth of 166,000 tons by 2019 [1]. According to 7th census of world casting production published by AFS [2], annual Mg casting production was about 226,673 metric tons which contributes only 0.225% in total ferrous & non-ferrous annual casting production and that also represents 21% growth rate from the previous year. Thermal stability of mould is the main factor influencing the interfacial reactions. Hong et al. [3] have evaluated the thermal stability of ceramic oxides by pouring Mg AZ91 melt in different ceramic moulds. Kim and Kim [4] investigated the effects of mould preheating temperature and mould material for interfacial reaction, which shows that casting produced with Al_2O_3 mould found with lesser mould metal reaction at interface. Dube et al. [5] have performed experiments with Calcium Sulphate ($CaSO_4$) in investment casting of Mg AZ91 alloy

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Harish Kumar Sharma, Sujit Kumar Verma, Pradeep Kumar Singh, Satish Kumar, ... Piyush Singhal

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Influence of TiC thin film growth morphology deposited by RF magnetron sputtering on the mechanical and tribology properties of Ti6Al4V

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Experimental evaluation of influence of temperature on nature of fracture in formability test of alpha-beta titanium alloy

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Performance improvement of a conventional single slope single basin passive solar still by integrating with nanofluid-based parabolic trough collector: An experimental study

Dattatraya G. Subhedar, Kamlesh V. Chauhan, Krunal Patel, Bharat M. Ramani

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A review on optimization techniques used in civil engineering material and structure design

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Performance improvement of a conventional single slope single basin passive solar still by integrating with nanofluid-based parabolic trough collector: An experimental study

Dattatraya G. Subhedar [a,*], Kamlesh V. Chauhan [a], Krunal Patel [a], Bharat M. Ramani [b]

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ABSTRACT

Nowadays due to advancement in nanotechnology, it is possible to prepare nanoparticles, which is very much useful to enhance the thermal properties of heat transfer fluids. A Nanofluid is advanced heat transfer fluid with dispersed nanoparticles in base fluid. This paper is about the experimental study carried out to study the effectiveness of conventional single slope solar still plant (CSP) integrated with parabolic trough collector (PTC) using Nanofluid. Experiments were carried for water and Al_2O_3/Water nanofluid with 0.05% and 0.1% volume fraction as a working fluid in the integrated system. The results show that pure water yield is remarkably increase using the integrated still plant. It is observed that maximum yield is found 1741 ml with 0.1% volume fraction Al_2O_3/Water nanofluid as working fluid for 2.5 cm saline water depth in 1 m^2 basin. This shows approximately 66% and 70% rise in the yield and thermal efficiency respectively using Al_2O_3/Water nanofluid integrated solar still system than CSP.

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1. Introduction

Heat transfer is a major area of investigation in Thermal Engineering applications. Heat transfer fluid plays an vital role to enhance the performance of many applications as well as the size of the system. The conventional heat transfer fluids like water, oil, Ethylene Glycol etc. are having very low thermal conductivity. The modern nanoscience makes possible to manufacture nanoparticles which are having good thermal properties make possible to enhance the thermal properties of conventional heat transfer fluid. Nanofluid is a fluid having suspended nanoparticles which enhance the thermal properties as compare to the base fluid [1]. Rapidly Increasing population facing crucial issue of clean potable water to survive their life as availability of sources of fresh water on earth are not matching with the requirement. So, many researchers are focusing their work to find out the alternative ways to get clean water for life on earth using nanofluid.

As on earth ample quantity of salt water sources like sea and ocean are available, people started to design a system which will produce the potable water from salty water using thermal energy or electrical energy. As the Sun energy is easily available on the earth, Desalination is the most economical way of converting saline water into fresh water by using thermal Energy from the Sun. In this process the excess minerals from the salty water can be removed using sun energy. Due to addition of heat into salty water, evaporation of water takes place which after condensation gives fresh water. Solar Still is the system, required to get potable water using solar energy.

Though the process of getting fresh water using solar still is economical and simple, the major disadvantage is the production rate is poor. So, to meet the requirement of fresh water need to use solar still having huge surface area. That requires heavy initial investment on construction of solar still plant and land required to install that. As availability of land for increasing population is another issue. For this reason, many researchers are trying to enhance the productivity of compact solar still. People had studied performance of Single slope, double slope solar still plant using proper insulation, Phase Change Material, Nanofluid in basin, corrugated basin surface, absorbent etc. Tiwari et al. observed increase in the yield from 1.14 Litters to 3.08 Litters after coupling the Flat plate collector (FPC) to CSP [2]. In this system productivity of CSP

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Effect of mixing proportion and mixing time on primary slurry retention and surface roughness of investment casting shells

A V Vyas, M P Pandya and M P Sutaria

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IOP Conf. Series: Materials Science and Engineering **872** (2020) 012094 doi:10.1088/1757-899X/872/1/012094

Effect of mixing proportion and mixing time on primary slurry retention and surface roughness of investment casting shells

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Abstract : Surface quality of investment cast parts are mainly depends upon primary slurry condition which is used to make face coat. Zircon flour ($ZrSiO_4$) is widely used to make primary slurry. In this work different composition (75% - 25%, 70% - 30% and 65% - 35%) of zircon flour and colloidal silica is analyzed at different mixing time (at 24hrs, 48hrs and 72hrs). Viscosity, wettability, slurry retention, and surface roughness are measured and analysed. From the experimental work conclusion derived that composition with 75% zircon and 25% colloidal silica at mixing time of 72 hour gives best result in surface finish.

1. INTRODUCTION

Investment casting process is used to make casting products for many centuries. It is known as near-net shape process due to higher surface finish and good dimensional accuracy even in complex shapes. It is used for making of complex shapes of expansive metals where post processing is not affordable [1].Principle of investment casting has been found to be used for rudimental items like jewellery, arts and idols in 5000 BC. Archaeologists investigated that Mesopotamia was the location of a civilised society who have skills in metallurgy and engineering, and also having knowledge to produce gold, silver and copper artefacts by investment casting. Investment casting process is widely used to make nozzles, turbine blades, vanes, valves and pumps and other items. In recent years, this process is found to be the most suitable to make body implants, due to its higher accuracy and surface finish [2, 3]. Due to poor machinability of Al metal matrix composite, investment casting is a potential option for making composite products [4].

Primary slurries to apply face coat are prepared by mixing flours with binder solution. Among the various primary coats applied with flours like SiO_2, Al_2O_3, and $ZrSiO_4$, shell made with zircon flour ($ZrSiO_4$) exhibits excellent surface morphology [5]. It was observed that with higher viscosity, thicker layer of primary coat was developed[6]. The ceramic retention (plate weight) of slurries increases with the increase in flour loading. The retention of slurry with higher flour to binder ratio provides thicker and smoother primary coat. Higher flour to binder ratio also improves the shell surface leading to better surface finish [7]. Higher viscosity binder with same ceramic flour to binder ratio provides higher viscosity of slurry,leading to higher suspensibility and retention. Optimal flour to binder ratio gives better surface finish [8].

Mixing proportion of flour with binder solution and mixing time while preparing primary slurry governs the slurry retention and surface finish of ceramic shell. In the present work zircon flour is

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Abstract: This paper discusses various TBC materials, its properties and its effect on IC engine performance. Ceramics, in contrast to metals, are often more resistant to oxidation, corrosion and wear, as well as being better thermal insulators. Except for yttria-stabilized zirconia, other materials such as lanthanum zirconate and rare earth oxides are also promising materials for thermal barrier coatings. Thermal barrier coatings enhanced the performance of the IC engine. Applied the TBC on the surface of the piston with the help of various deposition techniques. The coating system has affected the many operating parameters of an engine like fuel consumption, power, and the combustion efficiency, pollution contents and the fatigue lifetime of engine components. The help of coating in the automotive industry has been found to yield a significant effect on the efficiency of engines, higher the operating temperature more will be the efficiency of the system.

Keywords: Thermal barrier coating, ceramic material, IC engine.

1. INTRODUCTION

The first use of Thermal barrier coating (TBC) was for aircraft engine performance. The concept of thermal barrier coating for diesel engines began in the 1980s. The petroleum crisis and the subsequent increase in the cost of fuels, the improvement of fuels and the improvement of fuel economy of the I.C Engines have become a high priority to the researchers [1]. Thermal barrier coatings (TBCs), which protect metallic components from high-temperature environments, have been widely applied to the fields of high-temperature and corrosion-resistant structural parts such as gas turbine engines, diesel engines, and power generation systems. In any engine, the piston is the most useful element among them all. Say that it's the heart of the IC engine. The work for the piston is to compressing the fuel throughout the compression stroke and transmit the power to the connecting rod through the crankshaft. During the expansion stroke in the petrol engine, 1/3 of total energy is wasted from the coolant, 1/3 from the exhaust. Only 1/3 of it is used to produced power, so if it increases the efficiency of the engine so for that to reduce the heat losses. Theoretically if reduced the heat loss from the engine wall then efficiency will be increased. The overall efficiency of the engine is near around 40-42%. For the engineer it's a major problem, solve that problem helps with thermal barrier coatings. The Material used in coating is Yttria Stabilized Zirconia (YSZ), Partially Stabilized Zirconia (PSZ), Garnets, Spinel, Mullite, Alumina, etc. The properties of this material which is desirable for having very low conductivity while remaining stable at nominal operating temperatures typically seen in applications.[1] is shown in figure 1. The Importance of coated piston is to Reduce Friction, enhanced Thermal efficiency, Specific fuel consumption is reduced, Engine power

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Productivity improvement through identifying hazardous conditions in steel foundry

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Abstract: Steel production from past decade shows prominent growth in Indian economy. Rapid strides have also made towards further growth and commissioning of new capacities. One of the prominent Productivity measurement tool in any company is the labor cost and its safety. In this paper, we discuss and identify the core hazardous conditions in steel foundry which may directly effects the productivity of steel industries. We also suggested the measures taken from technologies advancement, and to improve the occupational conditions of foundry.

1. Introduction

Steel plays a very important role in our day to day life. Steel and its alloys can be used in many mechanical and electrical applications. Product of steel plays a very important in sharing market shares as well as increasing development of the country. Steel is the main source of product in many micro and macro industries which cover almost 88% of the total industries of India. Steel will directly improve the social-economic status of the workers and the industries associated with it. Steel is easily available which makes industries to improve their productivity, also makes them flexible to try new products as per the market demands. [1]

Countries GDP shows growth in real time, hence to enhance the GDP of our country, Indian steel industries plays a vital role. More the export of the steel from the country which directly provide fund to the government hence provide better opportunity to become well developed nation. India stood 4th in global map on producing steel and its alloys. Our countries growth mainly depends upon the consumption and utilization of steel also on the growth of export quality of steel.[2]Micro and macro steel production capacity must be enhance in order to increase the profit. Production cannot be increase as provided the safer environment to the workers working in it. Even the lesser the accidents more the workers will feel safe in industry. So to increase the productivity of the industries we must provide a safer work place to the workers.Figure 1 shows main industries that are directly producing steel in larger quantity.[3]

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Design and analysis of multi-angular gearless transmission system

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Abstract: The present work mainly focuses on finding an alternate option of gear drives for various power transmitting applications in different sectors. In this study, the gearless power transmission mechanism created to transmit the power at various angles between the driving shaft and driven shaft, ranging from 0° to 180°. The system is modeled and analyzed in CREO5.0 to check the feasibility of the system. The speed analysis revealed that the speed ratio of the output shaft to the input shaft remained 1:1 during operation. The von mises stress analysis indicated that the design is safe under specific loading criteria. It observed from deformation analysis that the maximum displacement has occurred at the corner of the elbow link. The failure index analysis of the elbow link revealed that the inner curvature of a link is subjected to the maximum possibility of failure.

Keywords: Analysis, Design, Failure index, Gearless mechanism, Speed ratio

1. INTRODUCTION

The gear drives are extensively used for accurate and variable power transmission in various sectors like Automobile, Aerospace, Marine and Defence, Industrial cutting and machine tools, Lifting and hoisting devices, etc. The main drawback of gear drive is less efficient due to errors like backlash, resulting in the vibrations during operations and decrement in product life due to more wear rate of components [1].

Selby,1917 developed an innovative gearless mechanism in which speed was varied by forwarding and backward movement by applied shaft-hub assembly [2]. Johnson,1966 established the apparatus especially for automobile and aerospace industries in which the power was transferred in terms of increasing or decreasing speedthrough rotating frictionless balls [3]. Chakradhar, et al., 2019 showed advantages like less floor space area, simple working, lower friction and smooth operation, interchangeability of components, reduction in production cost, etc. of gearless mechanisms over gear equipped mechanisms [4]. Wu & Dong, 2014 analyzed the gearless reducer mechanism by introducing frictionless balls for unilateral and bilateral transmission. The trial experiments for both types of transmission revealed smooth operations and effective working efficiency [5]. Pramesh, et al., 2017 performed design and analysis of gearless elbow mechanism in Ansys software by a varying number of pins. It was proved from a simulation that the deformation and developed stress values were raised with an increasing number of pins [6]. The greater number of pins will be increasing the friction loss and weight of setup which results in power transmitting efficiency. Pawar, et al., 2018 designed a gearless elbow mechanism with three pins situated at 120° each for right angle (90°) power transmission [7].

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Experimental investigation of performance and emission characteristics of diesel engine with use of rape seed oil as biodiesel

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Effect of mixing proportion and mixing time on primary slurry retention and surface roughness of investment casting shells

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Experimental investigation of performance and emission characteristics of diesel engine with use of rape seed oil as biodiesel

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Abstract : In this paper, emission and performance characteristics of diesel fuel-engine was investigated using blending of diesel with bio diesel under steady state. Rape-seed oil was used as biodiesel and blended in diesel with different proportions of 10%, 20% and 30% by volume. The engine used in experiment was single cylinder 4-stroke diesel fuel-engine having water cooling system. Result shows that BTE decreases with more addition of bio-diesel in % fraction. For 10% blend, BTE of engine is almost same compared to diesel. The emission characteristics were remarkably improved by increasing volume fraction of rape seed oil except NOx emission. NOx emission was found maximum for 30% diesel-bio diesel blend.

KEYWORDS: Rape seed oil, Bio-diesel, Volume fraction, NOx emission

Nomenclatures:

BTE	Brake Thermal Efficiency
BSFC	Brake Specific Fuel Consumption
CRDI	Common Rail Diesel Injection
VCRDE	Variable Compression Ratio Engine
CO	Carbon Monoxide
HC	Hydrocarbon
NO_x	Nitrogen Oxide

1. INTRODUCTION

Fossil fuels are most popular as source of heat energy in automobiles, power generation, industries and agricultural sector. With increase in living standard of mankind, requirement of energy generation also increases day by day. On other side, reserve of petroleum resources is also limited and getting depleted progressively. In continuation with that, environmental pollution is one of the biggest challenge in current scenario. It is a high time to solve the issues related to reserve of fossil fuel and environmental pollution. The most convincing solution of above mentioned problem is use of alternative fuels along with conventional fuels. Bio-diesels are widely preferred among all the alternative fuels. Researchers around the globe proposed different techniques for use of vegetable oils in I.C. Engines includes esterification, direct blending with diesel, emulsification and pyrolysis. [1-2].

Sarvanan et al. have experimented on VCRDE using duel bio-diesel (Rape-seed oil and Mahua) blends. They concluded that BTE of engine decreases with increase in volume fraction of bio-diesel in diesel while emission characteristics got improved with increase in bio-diesel concentration. Raman et

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Flow modeling and simulation study of vacuum assisted resin transfer molding (VARTM) process: A review

M Shah and V Chaudhary

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Flow modeling and simulation study of vacuum assisted resin transfer molding (VARTM) process: A review

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Abstract: In recent times, vacuum-assisted resin transfer molding (VARTM) has become a promising technique for the processing of large composite structures. On the contrary, there are few issues related to VARTM processing as many process parameters are involved and required to optimize them to achieve high fiber volume fraction containing composite material. These issues can be addressed and resolved by an understanding of various flow modeling techniques and simulation methods. In this present study, a review of different approaches in flow modeling and simulation of the VARTM process is presented. The processing technology of VARTM along with the fundamental and constitutive models for mold filling stage as well as curing stage such as permeability, compaction, resin viscosity and cure kinetics are presented. The numerical simulation methods adopted by various researchers used to simulate the filling processes with their specific applications and simulation software are also reported and reviewed. As an outcome, identification of permeability of various fibers and simulation processing time are more predominant factors to perform accurate VARTM simulation.

1. INTRODUCTION

Polymer matrix composites (PMC) are becoming the prime choice in the category of material to replace metals and other materials in numerous sectors such as aeronautics, automotive, sports industry, construction, and marine structures. Composite structure also gives benefits in terms of reproducibility, quality, performances, environment friendliness and cost reduction, which are the indication of increasing the demand in the recent market. Among the various primary manufacturing processes for composites, Liquid Composite Molding (LCM) processes, for instance Resin Transfer Molding (RTM) and Vacuum Assisted Resin Transfer Molding (VARTM) are more suitable for processing complex shaped composite with a good surface finish and quality. Unlike the RTM process, VARTM provides significant reduction in the tooling cost as it requires a mold and a vacuum bag is used to close the mold. Therefore, manufacturing large composite structure such as ship hulls, windmill components and turbine blades, etc., VARTM is considered as the most cost-effective manufacturing method [1,2].

However, VARTM process can be critical, as it is required to complete the mold filling with adequate wetting of the fiber mat to achieve high fiber volume fraction in the composite. Incomplete resin infusion in the mold causes dry spots and resulted in defective parts. To accomplish good quality product, processing parameters, such as the locations and numbers of injections and vents need to be correctly set [3]. This problem can be addressed and understood by using mold filling simulation tool, allows the prediction of mold filling time, air trapped zones, resin flow around the inserts which probably lead to unfilled regions, etc [4]. Based on this, the VARTM process technology is discussed and formulated the VARTM model. In the present work, VARTM model and its implementation in the numerical simulation tool for creating a variety of real part by the contribution of various

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IMMT6091

Experimental Investigations of Bamboo, Cotton and Viscose Rayon Fiber Reinforced Unidirectional Composites

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Composite material occupies major part in the modern era due to it has good stiffness and high specific strength, lightweight, eco-friendly behavior and wide range of applications. Hence, composite material is chosen as a scope of research. In the present study, experimental investigations are carried out to find the tensile and flexural strength of unidirectional composites. For these, fabrication of composites are carried out using hand layup technique by selecting fibers: bamboo fiber, cotton fiber and viscous fiber as a reinforcement and polyesterresin as a matrix. The weight fraction of fiber is varied in the range 20%, 25%, 30%, 35% during fabrication of composite. Tensile testing and flexural testing of composites are carried out using the universal testing machine (UTM) as per the ASTM D3039/3039M-08 and ASTMD790-10 to measure tensile strength and flexural strength respectively. The simulation is also carried out for the prediction of tensile strength using ANSYS 15.0. The comparison of experimental results with simulation results is carried out to check the deviation of simulation results with experimental results. The paper signifies outcomes as: the tensile and flexural strength of the unidirectional composite increases with increase in weight fraction of fiber; the simulation results are good in agreement with experimental results.

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Experimental investigations of bamboo, cotton and viscose rayon fiber reinforced Unidirectional composites

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ABSTRACT

In the present study, the experimental investigations are carried out to find the tensile strength (TS) and flexural strength (FS) of unidirectional composites (UDC). For these, fabrication of composite (FOC) is carried out using hand layup technique by selecting fibers: bamboo fiber, cotton fiber and viscose rayon fiber as a reinforcement and polyester resin as a matrix. The weight fraction of fiber (w_f) is varied in the range of 20%, 25%, 30%, and 35% during FOC. Tensile testing and flexural testing of composites are carried out using the universal testing machine (UTM) to measure TS and FS. Tensile testing and flexural testing of composites are carried out as per the ASTM D3039/3039M-08 as per the ASTM D790-10 respectively. The FEA simulation is also carried out for the prediction of TS using ANSYS 15.0. The comparison of experimental results with simulation results is carried out to check the deviation of simulation results with experimental results. The paper signifies outcomes as the TS of the UDC rises with increase in w_f; the FS of the UDC rises with increase in w_f; the simulation results are good in consistence with experimental results.

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1. Introduction

Composite material becomes vigorous part of today's material due to it has various advantages such as of low weight, high fatigue strength, high specific strength, high specific stiffness, corrosion resistance, faster assembly, etc. [1–4]. Numerous composite products are used in industries across the world [5]. Hence, composite material is chosen as an area of the present study. In composite, the strength and stiffness are provided through the fibers and binding is made through the resin [6]. Hence, selection of fiber and resin is important parameter in composite. Natural fiber gives several benefits over traditional fibers such as low cost, low density, biodegradable, recyclable, no skin irritation, relatively high strength and stiffness and eco-friendly behavior to the environment, easily processed, etc. [7–17]. Hence, natural fiber is selected as a reinforcement. Here, bamboo fiber and cotton fibers are selected as fibers in natural fiber category due to it has good strength and easily availability from the market. One semi-synthetic fiber: viscose rayon fiber is also chosen as reinforcement due to it has advantages such as versatile, comfortable, soft, very smooth, breathable, relatively light, strong, robust, and inexpensive [18].

Fibers and fillers are reinforced in polymeric composite material due to it is a multi-phase material and as a result synergistic mechanical properties can be achieved that cannot be achieved from either component alone [19]. Hence, polyester resin is selected as a matrix from polymeric resin. Mechanical characterization of composite generates tremendous amount of interest in students and researchers in the field of composites. Hence, in present study, experimental investigations are carried out to discover the mechanical properties: tensile property and flexural property of UDC. For these, the FOC is carried out using hand lay-up technique and testing: tensile testing and flexural testing are carried out. The FEA simulation is also carried out to find the TS of UDC.

2. Experimental investigations

2.1. Materials procurement

Natural fiber: bamboo fiber and cotton fiber are procured in the specific grade of 7 yarn counts and 10 yarn counts respectively from the local market of Ahmedabad, Gujarat, India. Semi-

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Kawaljit singh Randhawa and Ashwin D Patel

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Abstract.PA6 micro composites with different weight percentage of diboron trioxide (B_2O_3) were fabricated by a twin-screw extruder and analysed for tribological behaviour. The weight percentage of B_2O_3 were 2, 4, and 8wt% of PA6 matrix. Tribological tests were performed on pin-on-disc apparatus under different loads, sliding distances, and sliding velocities. Results were shown for individual varying parameter as well as with the combination of two and all three varying parameters conditions. Results of the tribological study shows that the PA6 composite with 2wt% diboron trioxide fillers exhibits lowest friction coefficient (COF) and wear rate compare to others and followed by PA6 with 4wt% diboron trioxide filler composite. PA6 with 8wt% diboron trioxide fillers were not found effective in reducing COF and wear rate, infect it increased the COF and wear rate of PA6 and found maximum compare to pure PA6 and PA6 with 2 and 4wt% diboron trioxide fillers.

Keywords:PA6 composite; Diboron Trioxide; Friction; Wear; Solid Lubricant; Tribology

1. Introduction

Polyamides (PA) are having vast application areas like in automobile, electronics, electrical components, and household appliances. PA6 is one of the common subtypes of polyamide family and having pleasant mechanical properties. Lots of research have already done on PA family for further improving their mechanical and tribological properties. According to one research, fibres and particulate reinforcements are advantageous in reducing friction and wear in only dry conditions when rubbing with the smooth surfaces[1]. According to Lalit Guglani and T.C. Gupta's research, wear, and COF of PA66 was reduced when titanium dioxide fillers were used less than 6wt% and they got the best tribological results for 2wt% fillers [2]. According to the research of Abdullah, Unal, and Yetgin, addition of nano clay in PA6/PP blend improved tribological properties of blended material.COF with wear rates of PA6/PP blend reduced by the addition of nano clay fillers [3].Sathees Kumar and Kanagaraj found that the 20wt% graphite enhanced the wear resistance and tribological properties when encompassed in PA6. The addition of 20wt% graphite fillers enhanced the life of pure PA6 by a greater extent according to their research [4]. Yi-Lan You et al. investigated the influence of various fillers on tribological behaviour of PA6. In their results, they found that the glass fibres are more efficient in reducing COF and wear rate compare to talc when used as 15wt%and theCOF and wear rate found increased with increasing the load [5]. To achieve better tribological properties of polyamides, various metal oxides were used by the researchers like copper oxide, calcium oxide, zinc

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IMMT6091

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Preface

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Theoretical and experimental modal analysis of centrifugal pump radial flow impeller

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Abstract. Modal analysis is extensively used to identify the dynamic properties of a structure in terms of the dynamic characteristics: natural frequency, damping factor and mode shape.In this research, modal analysis has been carried out on a radial flow impeller of a centrifugal pump. The 3-D model of the impeller was built in CAD software Creo Parametric 1.0 from a 2-D drawing and that model was imported in FEA software package ANSYS for conducting modal analysis. The model was meshed effectively using SOLID187 elements. The first twenty natural frequency and mode shapes were extracted and nodal diameter was identified for each mode shape. The experimental modal analysis was conducted using impact hammer and the first twenty natural frequencies were identified using FFT analyzer. The natural frequencies of both the methods were compared and it was found that there is a good agreement between these results, thus the FE model is validated. The results are discussed and conclusions drawn.

1. Introduction

A centrifugal pump radial impeller is the rotating part transforming driver energy of the fluid into the kinetic energy. Due to the uncertain pattern of flow generated by the volute inside the radial impeller and whirling of impeller shaft, many dynamic forces are developed, leading to vibrations in the pump. The fatigue failure of the impeller is caused by fluctuating forces in combination with steady forces. The blades of the impeller are very critical components and they are exposed to very turbulent conditions. The blades of an impeller are frequently under very hostile operating conditions and damage the machine [1]. Reliability of impellers is very important parameter affecting the effective operation of the pump as well as environmental safety [2]. To design reliable impellers, the blade and disk modal analyses are of the utmost important. The evaluation of an impeller design is made by combining the dynamic behaviour with the nature of the fluctuating forces. Greater knowledge of the vibration behaviour of radial-flow impellers will be useful for optimizing their fatigue-life and efficiency, possibly resulting in increased performance and applicability. Modal analysis is the method

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Shear Mode Damper Testing Using Flake Shape Based Magnetorheological Fluids

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Artificial Intelligence for Compressive Strength Prediction of Concrete

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Shear Mode Damper Testing Using Flake Shape Based Magnetorheological Fluids

D. M. Patel[1*], D. V. Bhatt[2] and R. V. Upadhyay[3]

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Abstract: Use of anisotropic iron particles in the magnetorheological (MR) fluid having a high yield stress is a challenge as it increases the viscosity of the fluid in off-state. In this clause, a novel flake shaped iron powder based MR fluid with high yield stress is synthesized and used in shear mode MR damper (SMMD). MR damper design is optimized using fluid properties and Bingham model. Damping performance of newly synthesized MR fluid damper is at par with the available friction based damper used in front loaded washing machine. The unique feature of this design is minimal volume of the fluid (1.5 ml) required to achieve damping force of 50N. Effect of different volume percentage of particles in MR fluid is evaluated in terms of damping force. Effect of testing parameters like displacement and frequency of excitation on damping force was evaluated. Effect of settling of particle on damper performance is discussed in this work. It shows that the flakes shaped-based MR fluid show better stability against gravity. The smaller quantity of present flake shaped-based MR fluid will reduce the cost of shear mode damper.

1. Introduction

By using passive damper between structure and delicate equipment, it is possible to take in either shock (high damping) or vibration (low damping) during normal operation. Therefore, research was concentrated on developing active dampers for vibration isolation [1]. Semi-active damper utilizing Magnetorheological (MR) fluids also can be used for this requirement. The MR fluids are combinations of carrier oil, iron particles (micron-Sized). It's rheological properties are tune due to magnetic particles in presence of magnetic field [2,3]. MR effects (rheological properties) in the MR fluid has found numerous applications like MR shock absorbers [4], MR mounts [5], clutches, brakes [5,6], recoil system [7-9] etc.

In all these applications, the maximum effect is limited by the saturation magnetization of the dispersed magnetic particles. The performance of MR fluid in applications is judged by three parameters called figure of merits [10]. These are; (i) $F_1 = \tau_2/\eta$, where τ is yield stress and η is the viscosity of MR fluid at zero magnetic field, maximizing this figure of merit, helps in minimizing the device size and electrical power consumption. (ii) $F_2 = \tau_2/\eta\rho$, here ρ is the density of MR fluid. This is an important term, when one deals with weight-sensitive applications and (iii) $F_3 = \tau/BH$, here B and H are magnetic flux density and intensity of the fluid. Minimization of this figure of merit will help to reduce current requirement, and it is usually required for high bandwidth applications. Then all these virtues are to be optimized for the MR fluid properties. While the suitability of an MR fluid for a particular use depends on factors such as stability, durability and temperature range, therefore, it becomes very significant to design new MR fluids, which can enhance the MR effect.

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Effect of nano TiO_2-epoxy composite in bond strength and corrosion resistance of rebar embedded in micro-silica modified concrete

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Tribological behaviour of PA6/diborontrioxide composites

Kawaljit singh Randhawa and Ashwin D Patel

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Seismic vibrations of complex relief of the surface of the naryn canyon (on the Norin river in Kyrgyzstan) during large-scale underground explosions

I I Safarov, F F Homidov, B S Rakhmonov and Sh N Almuratov

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Tribological behaviour of PA6/diborontrioxide composites

Kawaljit singh Randhawa and Ashwin D Patel

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Abstract.PA6 micro composites with different weight percentage of diboron trioxide (B_2O_3) were fabricated by a twin-screw extruder and analysed for tribological behaviour. The weight percentage of B_2O_3 were 2, 4, and 8wt% of PA6 matrix. Tribological tests were performed on pin-on-disc apparatus under different loads, sliding distances, and sliding velocities. Results were shown for individual varying parameter as well as with the combination of two and all three varying parameters conditions. Results of the tribological study shows that the PA6 composite with 2wt% diboron trioxide fillers exhibits lowest friction coefficient (COF) and wear rate compare to others and followed by PA6 with 4wt% diboron trioxide filler composite. PA6 with 8wt% diboron trioxide fillers were not found effective in reducing COF and wear rate, infect it increased the COF and wear rate of PA6 and found maximum compare to pure PA6 and PA6 with 2 and 4wt% diboron trioxide fillers.

Keywords:PA6 composite; Diboron Trioxide; Friction; Wear; Solid Lubricant; Tribology

1. Introduction

Polyamides (PA) are having vast application areas like in automobile, electronics, electrical components, and household appliances. PA6 is one of the common subtypes of polyamide family and having pleasant mechanical properties. Lots of research have already done on PA family for further improving their mechanical and tribological properties. According to one research, fibres and particulate reinforcements are advantageous in reducing friction and wear in only dry conditions when rubbing with the smooth surfaces[1]. According to Lalit Guglani and T.C. Gupta's research, wear, and COF of PA66 was reduced when titanium dioxide fillers were used less than 6wt% and they got the best tribological results for 2wt% fillers [2]. According to the research of Abdullah, Unal, and Yetgin, addition of nano clay in PA6/PP blend improved tribological properties of blended material.COF with wear rates of PA6/PP blend reduced by the addition of nano clay fillers [3].Sathees Kumar and Kanagaraj found that the 20wt% graphite enhanced the wear resistance and tribological properties when encompassed in PA6. The addition of 20wt% graphite fillers enhanced the life of pure PA6 by a greater extent according to their research [4]. Yi-Lan You et al. investigated the influence of various fillers on tribological behaviour of PA6. In their results, they found that the glass fibres are more efficient in reducing COF and wear rate compare to talc when used as 15wt%and theCOF and wear rate found increased with increasing the load [5]. To achieve better tribological properties of polyamides, various metal oxides were used by the researchers like copper oxide, calcium oxide, zinc

Mrinmoy Majumder
Ganesh D. Kale *Editors*

Water and Energy Management in India

Artificial Neural Networks and Multi-Criteria Decision Making Approaches

Springer

Contents

A Review of Multiple Criteria Decision-Making Methods in Reference to Water Resources and Climate Science Applications

Hiteshri Shastri, Kaustubh Salvi, Shashikanth Kulkarni, and Saptarshi Misra

Abstract This chapter provides a review of the literature on multiple criteria decision-making (MCDM) applications to water resources and climate science problems. Inputs from these fields are extremely important for effective policy formulations, especially for agro-economy of India. However, characterized by uncertainties originating from different sources and complex governing physics, the outcomes of these fields are required to be applied to a constrained based system. Hence, a robust decision making tool is required to augment the policy formations against the systems with conflicting constraints. MCDM techniques are devised mainly to evaluate such problems with conflicting constraints and provide solutions. These methods reveal the credibility to deal with such situations. Seventy references describing eleven different MCDM approaches have been evaluated in this paper. This provides a unified source of references that could be useful for researchers and practitioners. Based on the review, some recent trends and future research directions are also highlighted.

Keywords MCDM · Climate change · Decision-making

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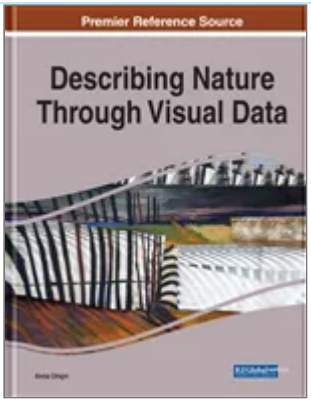

Describing Nature Through Visual Data

Anna Ursyn (/affiliate/anna-ursyn/199797/) (University of Northern Colorado, USA)

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Depicting the Nature of Nature: A Contemporary Approach to Developing Aesthetically-Driven Visual Data Derived From Primary Sources (/chapter/depicting-the-nature-of-nature/259683) (pages 114-138)

John Antoine Labadie

The term “visual data” is often connected with strategies related to developing graphs or other types of quantitative visual data arrays. Visual...
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Author(s)/Editor(s) Biography

Anna Ursyn, PhD, is a professor and Computer Graphics/Digital Media Area Head at the University of Northern Colorado. She combines programming, software and various media. Ursyn had over 40 single juried and invitational art shows, over 200 fine art exhibitions, such as over dozen times at SIGGRAPH Art Galleries, travelling shows Louvre, Paris, NTT Museum in Tokyo (5000 texts and 2000 images representing XX Century), and Virtual Media Network, the largest moving image outdoor display) Dallas Texas. Her work was selected to be sent by NASA to the Moon Museum MoonArk project. Research and pedagogy interests include integrated instruction in art, science, and computer art graphics. She published articles and artwork in books and journals. Since 1987 she serves as a Liaison, Organizing and Program Committee member of International IEEE Conferences on Information Visualization (iV) London, UK, and (CGIV), and as a Chair of the Symposium and Digital Art Gallery D-ART For iV. She serves as a chair of the SpaceTime International Student Competition for the ACM SIGGRAPH Conference. Anna has published six books with IGI-Global and book chapters. Website: Ursyn.com. ursyn@unco.edu

Chapter 6
Vachanamrut Visualization

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ABSTRACT

The authors discuss their interaction with data using various data visualization techniques, which are a quick, easy way to convey concepts universally. Currently, data has become more and more important; it is also important how one can visualize that data in the mind. This chapter is based on extracting important information from one of the holy Swaminarayan scriptures. The authors explore the content of the Vachanamrut, a unique work of prose in the Gujarati language, which contains discourses of Lord Swaminarayan and his conversation with saints and devotees. They convert the data in graphical interface using some libraries of the R tool. So, one can get the main idea of that data quickly, without a need to explain more about that data. Summing it up, this chapter examines the techniques of describing data of any ancient scripture or ancient text in any language by visualizing that data.

INTRODUCTION

If we observe today's generation and previous generations, one can find it obvious that most of the decisions of life depend mainly on the previous historical experience of other people. So, in today's era, every person relates to something called data, that means Data is equal to understanding. Every single information contains data; how to treat data that is different from person to person. "You can have data without information, but you cannot have information without data"– Daniel Keys Moran. (Marr, n.d.)

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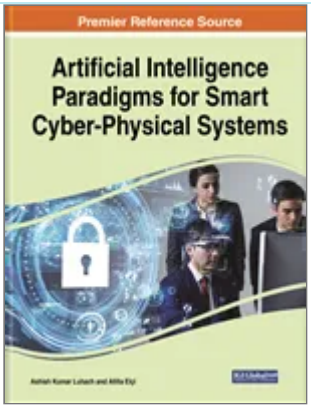

Artificial Intelligence Paradigms for Smart Cyber-Physical Systems

Ashish Kumar Luhach (The PNG University of Technology, Papua New Guinea) and Atilla Elçi (/affiliate/atilla-eli/240624/) (Hasan Kalyoncu University, Turkey)

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Social Perspective of Suspicious Activity Detection in Facial Analysis: An ML-Based Approach for the Indian Perspective (/chapter/social-perspective-of-suspicious-activity-detection-in-facial-analysis/266134) (pages 87-107)

Rohit Rastogi, Priyanshi Garg

The world is witnessing an unprecedented growth of cyber-physical systems (CPS), which are foreseen to revolutionize our world via creating new...
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Smart IDS and IPS for Cyber-Physical Systems (/chapter/smart-ids-and-ips-for-cyber-physical-systems/266136) (pages 109-136)

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One of the most important requirements is security and accessibility efforts which are represented as a critical issue that should be considered in...
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Srikanth Yadav M., Kalpana R.

In the present computing world, network intrusion detection systems are playing a vital part in detecting malicious activities, and enormous...
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Malicious URL Detection Using Machine Learning (/chapter/malicious-url-detection-using-machine-learning/266138) (pages 160-180)

Ferhat Ozgur Catak, Kevser Sahinbas, Volkan Dörtkardeş

Recently, with the increase in Internet usage, cybersecurity has been a significant challenge for computer systems. Different malicious URLs emit...
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Chapter 9 **$37.50**

Video-Based Human Authentication System for Access Control (/chapter/video-based-human-authentication-system-for-access-control/266139) (pages 181-202)

Chintan M. Bhatt, Kevin R. Patel, Yashvi Nileshbhai Raythatha, Poojan S. Dharaiya, Chirag Jethva, Karan Mehul Kathiriya, Vidhya Piyushbhai Kothadia, Deep Kothadiya, Vaishali Mewada, Mayuri Jamanadas Popat

The issue of security is paramount in any organisation. Therefore, the authors intend to aid in the security of such organisations by bringing a...
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Chapter 9
Video-Based Human Authentication System for Access Control

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ABSTRACT

The issue of security is paramount in any organisation. Therefore, the authors intend to aid in the security of such organisations by bringing a video based human authentication system for access control which is a type of cyber physical system (CPS). CPS is an integration of computation and physical processes; here the computation is provided by face detection and recognition algorithm and physical process is the input human face. This system aims to provide a platform that allows any authorized person to enter

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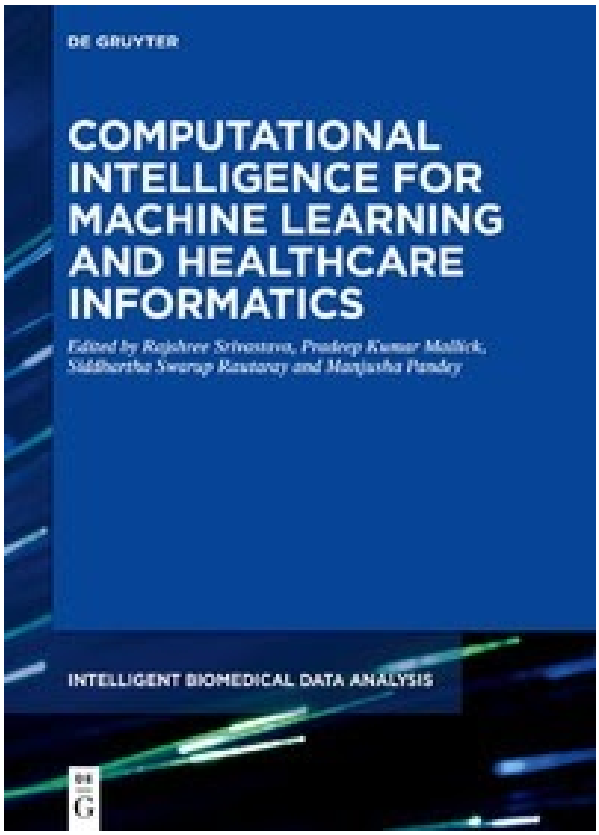
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INTELLIGENT BIOMEDICAL DATA ANALYSIS

Contents

Dhaval Bhoi, Amit Thakkar

12 Impact of sentiment analysis tools to improve patients' life in critical diseases

Abstract: The development, approbation, and acceptance of various social media tools and applications have opened new doors of opportunity for gaining crucial insight from unstructured information. Sentiment analysis and opinion mining have become popular in modern years and can be applied in diversified application areas like healthcare informatics, sports, financial sector, politics, tourism, and consumer activities and behavior. In this regard, this chapter presents how sentiment analysis can help for betterment of people suffering from critical diseases. Healthcare-related unstructured tweets relating to being shared on Twitter is becoming crowd-pleasing source of information for healthcare research. Sentiment analysis is becoming metric measurement to find out feelings or opinion of patient suffering from severe diseases. Various tools and methodologies are used, from which color-coded Word Cloud can be formed based on sentiment. Exploring the methods used for sentiment analysis on healthcare research can allow us to get better insight and understanding of human feelings and their psychology and mindset. The study shows various types of tools used in each case and different media sources and examines its impact and improvement in diseases like obesity, diabetes, cardiovascular disease, hypertension, schizophrenia, Alzheimer's disease, and cancer using sentiment analysis and its impact on one's life. Sentiment analysis helps in designing strategies to improve patients understanding and behavior.

Keywords: Sentiment analysis, Healthcare informatics, Social media, Word Cloud

12.1 Introduction

Huge amount of textual data is collected by the healthcare industry. In year 2013, California-based health network collected medical records in electronic form with various images and annotations in data (W. Raghupathi and V. Raghupathi). Most of the information is stored as text records (Gupta and Lehal, 2010) in e-health records, hand-written observations form by physicians regarding patient's visits, social media, prescriptions, and letters. Further, "The majority of medical doctor

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ICT FOR COMPETITIVE STRATEGIES

PROCEEDINGS OF 4TH INTERNATIONAL CONFERENCE ON INFORMATION AND COMMUNICATION TECHNOLOGY FOR COMPETITIVE STRATEGIES (ICTCS 2019), DECEMBER 13th-14th, 2019, UDAIPUR, INDIA

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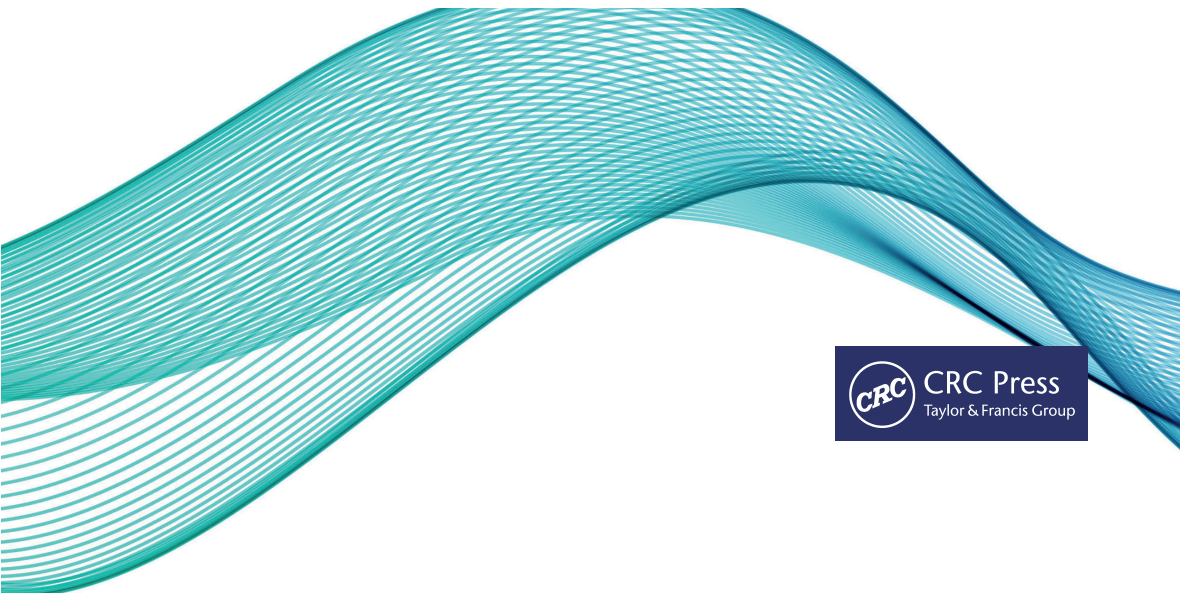

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Table of Contents

Comparison of regression techniques for predicting the academic performance of students in Educational Data Mining

Amit Thakkar, Jalpesh Vasa, Priya Nasit, Dhvani Raval
Smt. K. D. Patel Department of Information Technology, Chandubhai S. Patel Institute of Technology, CHARUSAT, Changa, Gujarat, INDIA

ABSTRACT: In the current educational system, predicting student performance will surely help the teacher to keep track of the progress of a student. These prediction systems support universities and students in improving a student's performance. This paper represents machine learning techniques for predicting student's performance. This paper aims to investigate those machine-learning methods fit to predict student performance from in-house E-Governance system data in the context of Educational Data Mining(EDM). We have used Polynomial Regression, Decision Tree and Random Forest Model for performance forecasting of graduates from various engineering streams. By predicting student's academic result priory can help both teacher and student to improve their teaching techniques and effectiveness of learning process, respectively.

Keywords: Machine Learning, Polynomial Regression, Decision Tree Regression, Random Forest Regression, Student performance, Educational Data Mining(EDM)

1. INTRODUCTION

In recent years, the availability of educational data has increased rapidly and these large amounts of data generated from this educational system need to be analyzed. Many universities have already started using the online Learning Management System (LMS) tools. These tools are capable of accessing and sharing data from all over the world, tracking student progress and providing rich educational content [1,10,12].

Educational institutions have used Educational Data Mining (EDM) to obtain an in-depth and thorough knowledge of their educational programs to strengthen their assessment, evaluation, planning and decision-making. EDM can help academic programs detect and uncover hidden trends in the results, which can be used to accurately forecast student performance.

We predict a student's academic performance using their scores only. Such systems are beneficial for student and faculty both to improve teaching technique and quality of education.

In section 2, related work is explained. Section 3 comprises of detailed methodology. In section 4 describes Experimental Setup and section 5 presents Experimental Result and Analysis. The last section is about the conclusion and future enhancement.

2. RELATED WORK

Recently, Due to the large volume of data in academic databases, forecasting student performance becomes more difficult. In [1] authors have provided an overview of the data mining techniques that have been used to predict students' performance and focus on how the prediction algorithm can be used to identify the most important attributes in a student's data. In [2] authors have used different data mining algorithm like Decision Tree, Naïve Bayes and Support Vector Machine for predicting student's performance. In [3], bilayered structure comprising of multiple base predictors and a cascade of ensemble predictors is developed for making predictions based on students' evolving performance states. In [4] authors have used data of undergraduate colleges in Kolkata. They used different feature selection algorithms to reduce the number of features.[11,12]

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Rajshree Srivastava would like to dedicate this book to her father Dr. R. L. Srivastava, mother Smt. Nandini Srivastava, and brother Sarvesh Lal Srivastava.
Pradeep Kumar Mallick would like to dedicate this book to his parents and students.
Siddharth Swarup Rautray would like to dedicate this book to his parents.
Manjusha Pandey would like to dedicate this book to her parents.

Contents

Dhaval Bhoi, Amit Thakkar

12 Impact of sentiment analysis tools to improve patients' life in critical diseases

Abstract: The development, approbation, and acceptance of various social media tools and applications have opened new doors of opportunity for gaining crucial insight from unstructured information. Sentiment analysis and opinion mining have become popular in modern years and can be applied in diversified application areas like healthcare informatics, sports, financial sector, politics, tourism, and consumer activities and behavior. In this regard, this chapter presents how sentiment analysis can help for betterment of people suffering from critical diseases. Healthcare-related unstructured tweets relating to being shared on Twitter is becoming crowd-pleasing source of information for healthcare research. Sentiment analysis is becoming metric measurement to find out feelings or opinion of patient suffering from severe diseases. Various tools and methodologies are used, from which color-coded Word Cloud can be formed based on sentiment. Exploring the methods used for sentiment analysis on healthcare research can allow us to get better insight and understanding of human feelings and their psychology and mindset. The study shows various types of tools used in each case and different media sources and examines its impact and improvement in diseases like obesity, diabetes, cardiovascular disease, hypertension, schizophrenia, Alzheimer's disease, and cancer using sentiment analysis and its impact on one's life. Sentiment analysis helps in designing strategies to improve patients understanding and behavior.

Keywords: Sentiment analysis, Healthcare informatics, Social media, Word Cloud

12.1 Introduction

Huge amount of textual data is collected by the healthcare industry. In year 2013, California-based health network collected medical records in electronic form with various images and annotations in data (W. Raghupathi and V. Raghupathi). Most of the information is stored as text records (Gupta and Lehal, 2010) in e-health records, hand-written observations form by physicians regarding patient's visits, social media, prescriptions, and letters. Further, "The majority of medical doctor

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Tomonobu Senjyu · Parikshit N. Mahalle ·
Thinagaran Perumal · Amit Joshi
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Contents

Internet of Things (IoT)-Based Advanced Voting Machine System Enhanced Using Low-Cost IoT Embedded Device and Cloud Platform

Miral M. Desai, Jignesh J. Patoliya, and Hiren K. Mewada

Abstract The traditional voting system is basically of two major types. One is voting through ballot paper and another one is voting through electronic voting machine (EVM). Voting system through ballot paper requires so much resources as well as security. There will be maximum possibility of malfunctioning in case of ballot paper-based voting machine. Electronic voting machine-based voting system is better than ballot paper-based system, but it is not authenticated. This paper describes the design of smart and secure electronic voting machine based on the IoT platform. The suggested system is more efficient than both traditional systems, as both traditional systems are time consuming and also not authenticated. The proposed system functions into two specific phases. One is user authentication, and another is user voting. Authentication process can be done using fingerprint authentication. Fingerprint database of all the voters is stored in the system initially as prerequisites. If any person wants to vote to any party, the authentication of respective person is to be done by fingerprint matching process. Once the fingerprint matches successfully, the person can vote to any specific party. Data analysis can be done in form statistics of the percentage voting of individual party and is to be uploaded on the web server as well as Google spreadsheet. Due to the fingerprint authentication method, malfunctioning like fake voting and repeat vote can be avoided. As the system is based on the fingerprint authentication, in future it can be linked with the Aadhaar Card of the respective person.

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Contents

QR Code Scanner Enabled Smart Car Parking System Using Raspberry Pi with Android App Access

Yesha Patel(✉), Preksha Gandhi, Swapnil Shah, Shital Soman, and Arpan Desai

Charotar University of Science and Technology, Changa, India
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Abstract. A smart parking system using Raspberry Pi and android app access is proposed in this article. An automated smart parking system which provides the user to pre-book along with on the spot booking facility of parking spaces available around the area is implemented. The system also helps to store the user's information in database which enables for fast parking access thus reducing the traffic congestion. The hardware is realized using Raspberry Pi and IR sensor. In addition, the system is controlled through an app which is made using Kodular App Development tool, that helps the user to keep track of the updates about available parking spaces. The scalable and precise database can be created on firebase and host it on an application in real-time which is useful to store data in a json format (bucket format). The system is a perfect partner for people to book the parking spaces at their ease from remote locations without wasting time and avoiding traffic congestion.

Keywords: QR code scanning · Real-time database · Slot booking · Admin management

1 Introduction

Internet of things (IoT), a topic most discussed nowadays is a concept that connects billions of devices with the internet at any time and any place. The increasing traffic congestion has also led to increase in pollution. The number of vehicles is skyrocketing in India which causes imbalance in the ratio of vehicle and available parking spaces. In metropolitan areas, the traffic has also caused increase in anxiety level of drivers [1]. One of the most common problems today is less availability of parking spaces. Vehicles continue to outnumber existing parking spaces, thus clogging roads. Incidences of violence due to occupancy, deformed cars due to a space crunch, and overcharging for parking are some of the problems. The families are getting smaller but the total number of motor vehicles is exceeding the total number of heads per family which worsens the current parking scenario in the country. The situation is such that on any given working day approximately 40% of the roads in urban regions are taken up just for parking the cars. The problem has been further exacerbated by the fact that people from low-income groups are also able to own cars. Most cities propose

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Interleave-Division Multiple Access Systems with Invert Tree Based Interleavers with Unequal Power Sharing Algorithm

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Charotar University of Science and Technology, CHARUSAT ,Changa, Gujarat, India

Abstract:
Power allocation is a major fear for practically coded Interleave division multiple access scheme. Various power allocation algorithms have been proposed for IDMA system. In this paper, the performance improvement of IDMA system using unequal power algorithm with comparison of various interleavers with coded and uncoded IDMA is presented. The simulation result shows that IDMA system gives better performance with invert tree based interleaver (ITBI) in comparison with other interleaver in terms of memory and complexity.

Keywords: unequal power, uncoded and coded IDMA, memory and complexity

1. INTRODUCTION:

Code-division multiple access (CDMA) and OFDM are currently an attractive candidate for 4G-LTE mobile communication and for future generation mobile communication. In CDMA, individual user message signal is extended by a spreading sequence at the sender and receiving end, the received signal is passed over de-spreader and matched filter which is matched to a spreading sequence [4]. If the spreading sequences are orthogonal to each other, there is no information loss from the matched filter. But this is the ideal case with all users synchronized and without intersymbol interference (ISI). However strict synchronization is difficult in uplink channel due to varying propagation delay. Also due to lower correlations amongst spreading codes for higher user count [10] it results in an increased MAI. Various multiuser detection has been proposed to suppress these two interferences, but their computational complexities restrict practical implementations [2-4]. Even though, after the advent of turbo codes [16-17], computational load can be much reduced with iterative multiuser detection [18], it is still a heavily burden to receiver in case of higher user count. The 3G standards have all set multiuser detection as option. However, it is still challenging to develop efficient and effective low-cost multiuser detectors.

Although CDMA alleviate the Multiple Access Interference(MAI)with multi user detector (MUD)but its high computational cost restricts the higher user application in practical systems. Also throughput of CDMA system with single user detection and same power allocation is limited to interference. With the advent of multi user detection, this problem has been examined.Also,due to complexity of multi user detection the implementation of practically coded CDMA system is very serious concern. A new multiple access schemes called interleave division multiple access(IDMA) is a variant of CDMA examined newly. In IDMA each user has distinguish interleavers and thus they are integral part of it. An interleaver can be a part of channel coder to improve coding gain or can be used as a channel interleaver to reduce the effect of fading by scrambling burst error into random error. It uses chip by chip MUD for treating MAI with less computational cost.

With equal power allocation IDMA can perform very close to theoretical limit [12]. With Unequal power allocation the system performance can be improved, but to calculate the best power profile is a big matter for practical coded systems [7].

Various unequal power allocation methods have been investigated like linear programming and an interior-point method (IPM) [15][19] for power optimization for IDMA with AWGN channel. In [15] improved power optimization technique for IDMA over AWGN channels with lower complexity is proposed. In this paper IDMA is simulated with improved linear programming method discussed in [15] over various interleavers. Simulation results shows that,IDMA with unequal power distribution using invert tree based interleaver(ITBI)[10] provides similar results as random interleaver and other interleavers with least complexity and bandwidth requirement.

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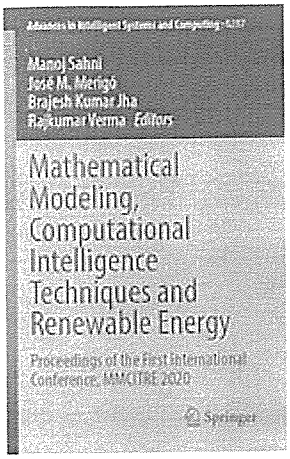

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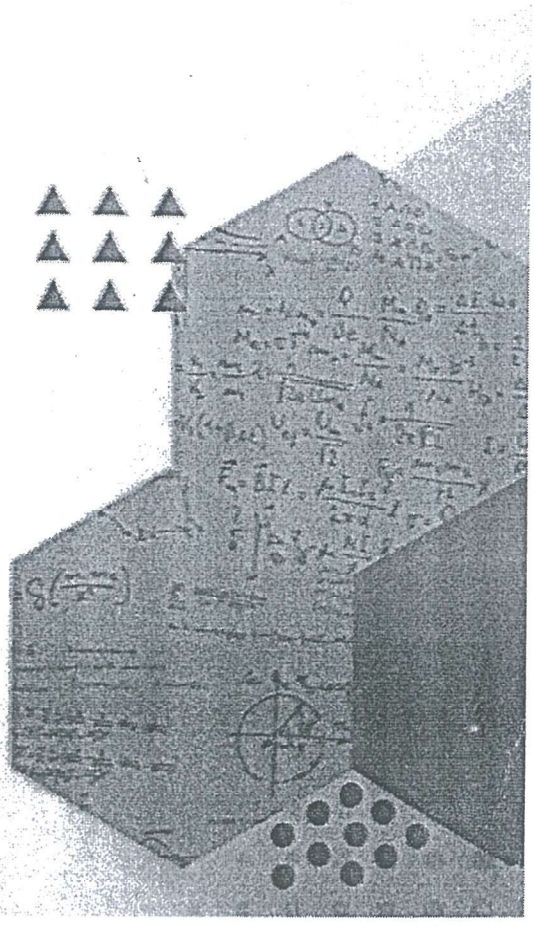

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Factors to consider: A review of smart grid implementation in India

Atmiya Patel[1*][0000-0002-8249-0765], Vipul N. Rajput[1] [0000-0001-6016-534X], Kartik S. Pandya [2][0000-0002-0155-000X], and Dipayan Guha [3][0000-0002-2603-6955]

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Abstract. The power sector of India is almost going to reach to its maturity owing to some significant recent improvements including reduction in power outages, stable frequency operations, improvement in voltage regulation, initiation of advanced metering installation and growing renewable resources. However, due to the centralize generation, the power grid of India is still suffering from high transmission and distribution losses, deficiency in fuel supply, electric theft, unbundling tariff structure, lacking of real-time control of grid and advanced infrastructure of the metering, lacking of concrete energy policies, etc. These challenges need to be addressed on an immediate basis by the effective deployment of the smart grid in India. This paper presents the scenario of these challenges for the Indian grid introduced during the journey of adapting the smart grid. First, the current scenario and key issues associated to the grid of India are explained. Subsequently, various aspects and policies for the implementation of smart grid are discussed. Finally, the enablers and barriers affecting the rapid evolving of smart grid in India are identified and discussed hypothetically. The motive of this paper is to provide a notable indicative assessment on the factors associated to smart gird of India which can be supportive to practitioners, researchers, and engineers involved in the smart grid deployment in India.

Keywords: Indian power grid, Smart grid, Enabler, Barrier

1 Introduction

A smart grid can be considered as modern electricity system which can proficiently assimilate the behavior and activities of all users associated to it – generators, clients and those that do both – so as to confirm economically effective, sustainable power network with small amount of losses and improved quality and security of supply and security [1]. The necessity of improving the consistency and efficacy of the power sector has been the origin of smart grid. Again, the depletion of fossil fuel and environment awareness increase the potential interest in renewable energy which is also one of the pioneers in the growth of the smart grid. As discussed in [2], smart meters which are

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Applied Computational Intelligence in Power Electronic Inverter to Mitigate Harmonics

Margi Shah and Kartik S. Pandya

Abstract This paper implies the application of artificial intelligence technique on cascade five-level H-bridge inverter with equal DC sources for objective of harmonic reduction. The multilevel modulation technique adopted is selective harmonic elimination. The approach is the development of optimal switching angles using particle swarm optimization technique with precise software and hardware validation. Harmonic analysis has been done at both optimized and unoptimized angles to corroborate the significance of AI method. The total harmonic distortion at optimized and unoptimized angles has corroborated that AI algorithms hold requisite dominance in one of the challenging issues of harmonic reduction.

Keywords Cascade multilevel inverter · Particle swarm optimization · Selective harmonic elimination

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Contents

A Review on Approaches Employed for Solving Directional Overcurrent Relays' Coordination Problem

Shanker D. Godwal, Kartik S. Pandya, Vipul N. Rajput and Santosh C. Vora

Abstract The directional overcurrent relay (DOCR) coordination is considered as a highly constrained, nonlinear, and non-convex optimization problem. In order to find the optimum solution of these problems, many extensive efforts have been kept by the researchers. The optimum solution of directional overcurrent relay which coordination can be obtained by choosing proper time–current characteristic of DOCR, appropriate selection of objective function, and right selection of soft computing technique. This paper gives the insight into various approaches employed for DOCRs' coordination which are as optimization method-based approach, objective function-based approach, and standard and non-standard relay characteristic-based approaches presented in the past literature. Also, this paper discusses mathematical formulation for overcurrent relay coordination.

Keywords Relay coordination · Plug setting · Time multiplier setting · Plug setting multiplier · Relay characteristics

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Contents

A New Objective Function for Optimal Coordination of Directional Over-current Relays

Jay Shah, Nirmal Khristi, Vipul N. Rajput and Kartik S. Pandya

Abstract This paper presents a novel objective function to obtain the optimum relay settings of directional over-current relays (DOCRs). The proposed improved objective function (IOF) is developed to solve the problems of previously proposed OFs. The proposed research work modifies the previous OFs by introducing a new weighting factor and adding a new term, for fixing mis-coordination problem and minimizing the operating times of both primary and backup relays. The performance of the proposed IOF is evaluated by using 3- and 8-bus test systems. The simulation results reflect the superiority of IOF, compared to other variety of OFs presented in the literature.

Keywords Genetic algorithm · Objective function · Over-current relay · Power system protection · Relay setting · Relay coordination

1 Introduction

Because of cost-effectiveness, the DOCRs are generally applied for primary protection in distribution systems and as a backup protection of transmission systems [1]. In the coordination procedure of relays, the primary relays should be operating within specified time to signal circuit breaker to remove faulty part. On the other hand, backup relays should come in action only after the certain time interval for

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Review of the Impact of Vehicle-to-Grid Schemes on Electrical Power Systems

Praghnesh Bhatt, Chao Long and Mahammadsoaib Saiyad

Abstract The vehicle-to-grid (V2G) describes plug-in electric vehicles (PEV), such as battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV), communicate with the power grid and sell demand response services by either returning electricity to the grid or by restricting their charging rate. Simultaneous charging of EV fleet can lead to an excessive loading, under-voltages and energy losses in distribution networks. On the other hand, the EVs in their idle mode has the ability to feed power back to grid which is useful for active power balancing, peak shaving, and stability enhancement. This paper reviews the V2G schemes to assess their impacts on the electrical power systems. The framework for coordinated operation of EVs with renewable energy sources in the various electricity markets was reviewed. The EVs' capability in energy loss minimization and provision of ancillary services such as frequency and voltage control was also investigated.

Keywords Ancillary service · Demand-side management · Electric vehicle · Optimal charging scheme · Vehicle-to-grid

1 Introduction

Electric vehicles (EVs) have been introduced into the market globally owing to the fact that EVs could significantly contribute towards the targets of the greenhouse gas emission reduction. The increasing share of EVs may have impact on power system performance, e.g. distribution network losses, peak power demand, voltage profiles, efficiency, reliability, and stability [1]. EVs are capable of delivering active and reactive power support, thus providing ancillary services for frequency regulation,

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Palmprint based Pattern Recognition Using Fast ICA

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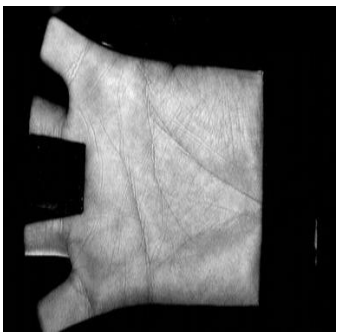
***Abstract*— The pattern of Palmprint has high dissimilarity because of its numerous determination features like ridges, principle lines, datum points, and wrinkles and so on. In this paper, a blend of Haar Wavelet, DCT and Fast ICA have been utilized to recognize the palmprint pattern using fast ICA. The images of Palm were initially decomposed by the Haar Wavelet and frequency band, independent of different image resolutions chosen for dimensionality decrease. Next on LL, band DCT was use. Lastly, Fast ICA use to discover the independent components of the DCT features. To find matching image, Euclidean Distance (ED) has been used. The procedure is validated on Polytechnic-University (Poly U) storage as well as the results show the efficiency and accuracy of the proposed method.**

Keywords*— *Independent Component Analysis (ICA), Palmprint, Discrete Cosine Transform (DCT), Haar Wavelet

I. INTRODUCTION

Palmprint is a biometric-based strategy of pattern recognition. This technique has numerous advantages, like stability, unique, collected, performance, and security, and so on. The palmprint recognition's error rate is the lowest in most biometric identification methods. The palmprint recognition has low cost, fast and high exactness features. Presently numerous research organizations at home and abroad invest a considerable measure of time and energy to do research of palm recognition. The palmprint pictures are taken from the poly U database to preprocess, as in Fig 1.

Fig. 1 Palmprint Image



In this manner, these pictures are taken to identify persons by utilizing Independent Component Analysis (ICA), it improve the accuracy of Palmprint recognition, having high dissimilarity because of its numerous determination features.

The paper is presented as layout of past efforts for palmprint recognition is described in section-II. The projected technique discussed in section-III. Section-IV gives the analysis and result. In the last section, V depicts the conclusion.

II. THE TRADITIONAL PALMPRINT RECOGNITION

Palmprint recognition implemented online in [1], based on the 2D Gabor phase, which is used to excerpt various sorts. Then extricated features use for corresponding by applying Hamming Distance.

"K P Shashikala et al., [2] took the palmprint for recognition based on QPCA, DWT and DCT. DWT and DCT used to preprocess the image. QPCA is applied to take out the features and extracted features are matched by applying Euclidean Distance (ED)".

S. M. Prasad et al., [3] used the palmprint for authentication. This method needs line and texture; both features to be extracted from the image of palmprint with the help of wavelet decomposition. Extracted features matched by product rule and sum rule.

Robust and competent point-based palmprint match based on Hough transform in [4]. Feature extracted from the principle line by applying the Hough transform. Gabor filter used to enhance the ridges.

The method used to recognize the palmprint is described in [5], which is based on minutiae. Minutiae features extracted by applying Gabor filter, which are matched by applying minutiae cylinder code.

The palmprint recognition technique based on the principle line described in [6]. In it PCA used for feature extraction and to match the features Euclidean Distance was applied.

"Hyperspactral palmprint image system is a method of correct feature band selection, implemented by Zhenhua Gout et al., [7]. This system extracted the features and selected best feature band using 2PCA".

In [8], multispectral biometrics system used, in which "Palmprint images are sampled by using DWT and PCA used for features extraction. Features are matched by using Euclidean Distance (ED)".

Use of Machine Learning Services in Cloud

Chandrashekhar S. Pawar, Amit Ganatra, Amit Nayak, Dipak Ramoliya, and Rajesh Patel

Abstract Machine learning services are the comprehensive description of integrated and semiautomated web devices covering most facilities problems such as preprocessing information, design preparation, and design assessment, with the further forecast. REST APIs can bridge the outcomes of predictions with one's inner IT infrastructure. Like the original SaaS, IaaS, and PaaS cloud delivery models, ML and AI fields cover high-level services to provide infrastructure and platform, exposed as APIs. This article identifying the most used Cloud Technologies for Machine Learning as a Service (MLaaS): Google Cloud AI, Amazon, and Microsoft Azure.

Keywords Machine learning (ML) · Machine learning as a service (MLaaS) · Application program interface (API) · Artificial intelligence (AI) · Technology–organization–environment (TOE) framework · Information system (IS)

1 Introduction

The development of ML alternatives involves sophisticated, understanding, and costly assets because of this ML was mostly available to big firms that had such capacities. However, it was difficult to harness ML's authority for larger businesses or personal IT experts. One way to address the above-mentioned issues would be to have an ML as a service (MLaaS) capable of providing on-demand computing funds and an obviously specified API for ML procedure. Such a website would allow consumers to concentrate on the issue, and they are attempting to fix rather than the information of execution.

The algorithms of machine learning which are built on deep neural networks (NN) have been widely used in diverse fields. As the use of cloud services grows, MLaaS is accessible, and the training and deployment of these machine learning models are achieved on cloud providers' infrastructure [1].

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Digital Learning: A New Perception to Learn Beyond the Classroom Boundary

Dweepna Garg, Radhika Patel, Rima Patel, Binal Kaka, Parth Goel, and Bhavika Patel

Abstract In the era of digital learning, when the mobile devices started gaining popularity, the Internet broke through the restriction on space and time and became a ubiquitous learning tool. The critical matters in the current information technology are the design of teaching activity in a way that is flexible which can be made interesting for the students. The challenge faced by most of the institutions is to provide online education to their students. This is because the institutions do not have the required set of digital capabilities. The lack of this digital strategy restricts few organizations to respond quickly to any customer query. It is preferred that in the competitive world, the institution should not only focus on digital learning but also try to bring about the innovative strategies with the help of which they can interact with the students. This would help in building an environment that is active, innovative, and challenging. Digital learning plays an important role in the skills landscape. This paper highlights the use of digital learning along with its impact on the society. The paper also showcases the existing systems that were used to impart the education and the limitations of it, which were then worked upon in the era of digital learning.

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IoT Based Self-Navigation Assistance for Visually Impaired

Nilesh Dubey, Gaurang Patel, Amit Nayak, and Amit Ganatra

Abstract One of the major challenges faced by visually challenged people is self-navigation in unknown environments. They often tend to get hurt by objects that they cannot feel using their hands or a walking cane, as certain objects are hard for a blind person to detect by just using tapping their walking cane. To avoid obstacles and navigate through a new environment, a smart belt for the visually impaired is performed in which he/she can continuously detect the obstacles around the user with its sensors that span the entire 360° of his/her field of view. Whenever an obstacle is in a nearby range, sufficiently enough to cause a hindrance, the device will give sensory cues to the user about the location of the obstacle and family members are also tracked them using GSM and GPRM system.

Keywords GSM · Obstacle detection · Visually impaired · HC-05 sensor system

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A Survey on Collaboration Technologies and Systems of ICT Application in the Field of Education

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Abstract.

Information and Communication Technology (ICT), such as the global use of mobile phones and the Internet, has made an unparalleled contribution to the growing world economy. In education, the significance of information and communications technology (ICT) is recognized around the world. Numerous information and communication technology platforms in education are making the teaching and learning process productive, reliable, easier, pleasant, wider and more comprehensive, Efforts are being made to provide digital information technology resources in academic institutions globally. Institutions of higher education, including government and private-funded (state and central government), have made tremendous investments in enabling ICT institutions. The academic effectiveness of ICTs depends on different factors, like usage, intention, and structure of socioeconomic support. Both modern technology, equipment and facilities require routine repairs and updates that are not carried out due to a lack of skilled and committed staff, resulting in their obsolescence. In order to clarify the above observations and some of their consequences in a larger socioeconomic sense, an institutional framework is used. This paper focuses on various ICT platforms and its application for teaching learning approach.

Keywords: ICT, WWW, RFID, AR, VR, MR, Social Media Networks.

1 Introduction to ICT Application

Information and Communication Technology (ICT) is a wide term for information technology industry and society in global world. ICT enables all communication technologies including computer, information sharing, mobile phones, software, internet, wireless communication technology, video meeting, social media network applications, stores of information and user services like access, store and retrieval of digital information from one place to another place with help of wired or wireless medium. Information and Communication Technology (ICT) is a type of education

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Tomonobu Senjyu
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Information and Communication Technology for Intelligent Systems

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Information and Communication Technology for Intelligent Systems

Proceedings of ICTIS 2020, Volume 1

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Preface

This SIST volume contains the papers presented at the ICTIS 2020: Fourth International Conference on Information and Communication Technology for Intelligent Systems. The conference was held during May 15–16, 2020, organized on a digital platform ZOOM due to Pandemic COVID–19. The supporting partners were InterYIT IFIP and Knowledge Chamber of Commerce and Industry (KCCI).

This conference aimed at targeting state-of-the-art as well as emerging topics pertaining to ICT and effective strategies for its implementation in engineering and intelligent applications. The objective of this international conference is to provide opportunities for the researchers, academicians, industry persons, and students to interact and exchange ideas, experience, and expertise in the current trend and strategies for information and communication technologies. Besides this, participants will also be enlightened about the vast avenues and current and emerging technological developments in the field of ICT in this era and its applications will be thoroughly explored and discussed. The conference is anticipated to attract a large number of high-quality submissions and stimulate the cutting-edge research discussions among many academic pioneering researchers, scientists, industrial engineers, students from all around the world and provide a forum to researchers; propose new technologies, share their experiences, and discuss future solutions for design infrastructure for ICT; provide a common platform for academic pioneering researchers, scientists, engineers, and students to share their views and achievements; enrich technocrats and academicians by presenting their innovative and constructive ideas; and focus on innovative issues at the international level by bringing together the experts from different countries. Research submissions in various advanced technology areas were received, and after a rigorous peer-review process with the help of the program committee members and external reviewers, 76 papers were accepted with an acceptance rate of 0.19 for this volume.

The conference featured many distinguished personalities like Mike Hinchey—PhD University of Limerick, Ireland, President, International Federation of Information Processing; Bharat Patel—Honorary Secretary General, Knowledge Chamber of Commerce and Industry, India; Aninda Bose—Sr. Editor, Springer, India; Mufti Mahmud—PhD, Nottingham Trent University, UK; Suresh Chandra

Satapathy—PhD, Kalinga Institute of Industrial Technology, Bhubaneswar, India; Neeraj Gupta—PhD, School of Engineering and Computer Science, Oakland University, USA; Nilanjan Dey—PhD, Techno India College of Technology, Kolkata, India. We are indebted to all our organizing partners for their immense support to make this virtual conference successfully possible. A total of 23 sessions were organized as a part of ICTIS 2020 including 22 technical and 1 inaugural session. Approximately, 154 papers were presented in 22 technical sessions with high discussion insights. The total number of accepted submissions was 112 with a focal point on ICT and intelligent systems. Our sincere thanks to our Organizing Secretary, ICTIS 2020—Mihir Chauhan, Conference Secretary, ICTIS 2020—Aman Barot, and the entire team of Global Knowledge Research Foundation and Conference committee for their hard work and support for the entire shift of ICTIS 2020 from physical to digital modes in these new normal times.

Nishihara, Japan — Tomonobu Senjyu
Pune, India — Parikshit N. Mahalle
Serdang, Malaysia — Thinagaran Perumal
Ahmedabad, India — Amit Joshi

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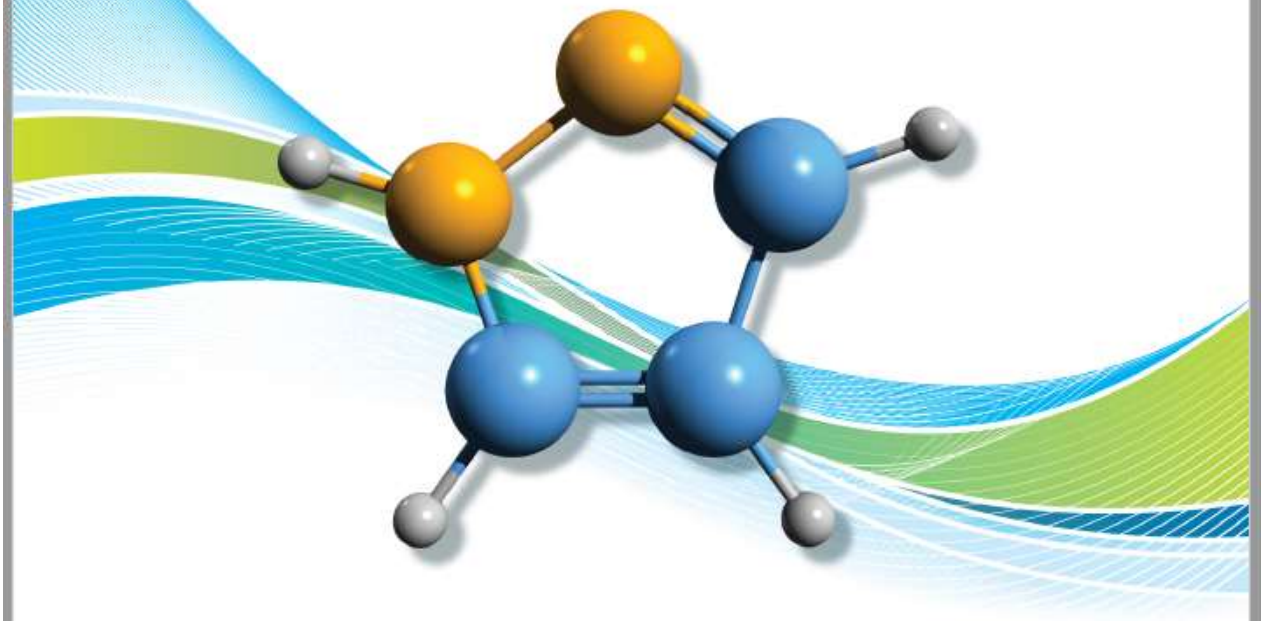
Pyrazole

Preparation and Uses



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Editor

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Chapter 14

DEVELOPMENT IN CHEMISTRY AND SYNTHESIS OF PYRAZOLE DERIVATIVES AS POTENTIAL ANTICANCER AGENTS

Ashish D. Patel[1,*], Vinod Kumar Gurjar[2] and Dilipkumar Pal[3]

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ABSTRACT

Now a days, for management of various health issue, heterocyclic compounds play a vital role in the development of effective drugs. Pyrazole, the five-membered nitrogen-containing heterocycle is an important scaffold possessing amenable to extensive, promising biological activities. Due to potential applications of pyrazoles, many recent novel routes for synthesizing pyrazoles is developed for the treatment of disease. As a consequence, in this chapter covering advances in the synthesis and application of pyrazoles for treatment of cancer in the past decades. This advancements on pyrazole synthesis will draw a clear picture to the researchers' lobby for the development of active pyrazoles scaffold with improvement in current methodologies.

Keywords: pyrazole, heterocyclic compounds, synthesis, cancer

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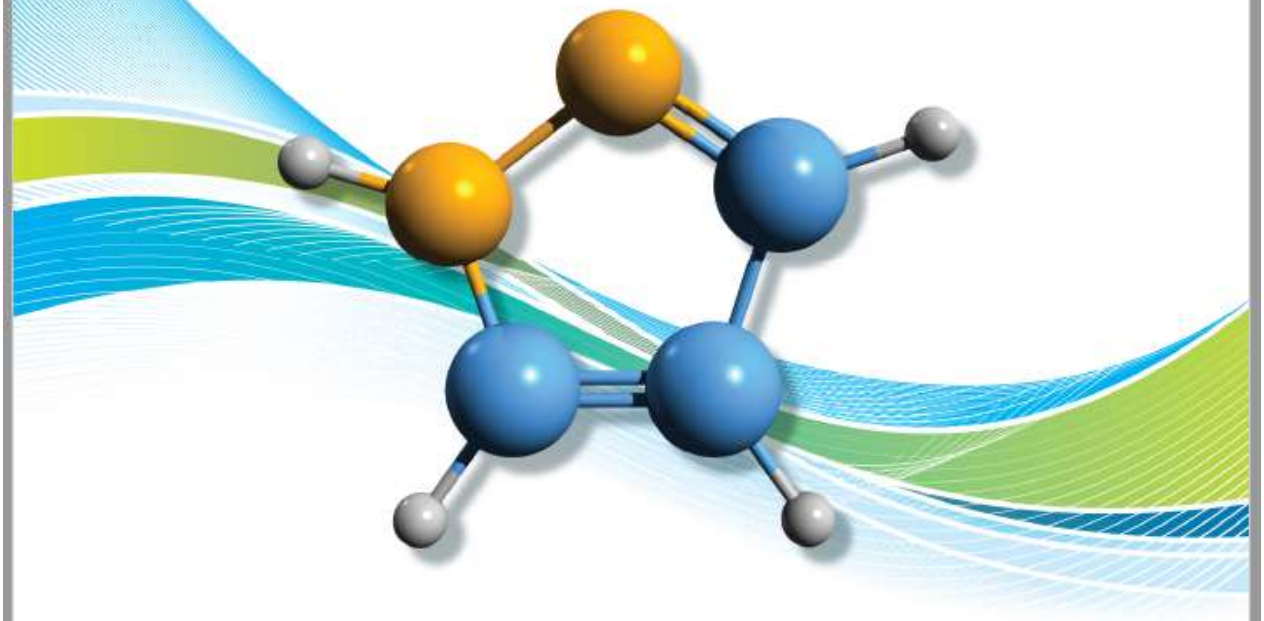
Pyrazole

Preparation and Uses



Dilipkumar Pal
Editor

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Chapter 15

RECENT ADVANCES IN CHEMISTRY AND SYNTHESIS OF PYRAZOLE DERIVATIVES AS POTENTIAL PROMISING ANTIMICROBIAL AGENTS

Vinod Kumar Gurjar[1], *Dilipkumar Pal*[2,*] *and Ashish D. Patel*[3]

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ABSTRACT

Pyrazoles and their variously substituted derivatives are important biological agents and a significant amount of research activity has been directed towards this class. The presence of this nucleus in therapeutic agents of diverse pharmacological categories such as celecoxib, a potent anti-inflammatory, the antipsychotic CDPPB, the anti-obesity drug rimonabant, difenamizole, an analgesic, betazole, an H2-receptor agonist and the antidepressant agent fezolamide have proved the pharmacological potential of the pyrazole moiety.

The treatment of bacterial infections remains a challenging therapeutic disaster because of emerging infectious diseases and the increasing number of multidrug-resistant microbial pathogens. Despite many antibiotics and chemotherapeutics available, the emergence of old and new antibiotic-resistant bacterial strains in the last decades lead to a

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POISONOUS PLANTS AND PHYTOCHEMICALS IN DRUG DISCOVERY

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2

Classification of Phytotoxins and their Mechanisms of Action

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POISONOUS PLANTS AND PHYTOCHEMICALS IN DRUG DISCOVERY

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Secondary Metabolites and Toxins of Microbial Origin for the Treatment of Diseases

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Authors | Authors and affiliations

Mittal Bhatt, Vishal Dahiya

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Chapter 11
Intelligent System to Diagnose LBP Using Genetic Algorithm and Support Vector Machine

Mittal Bhatt and Vishal Dahiya

1 Introduction

The field of medical science always an important application area for the implementation of newly evolves technology related to field of reasoning and learning [1–5]. Diagnosing for diseases is an art as it is differing verities of parameters from person to person. To carry out the procedure of diagnosis of diseases, medical practitioner has to identify relationship between reasons and responses and is hardly one to one. Designing intelligent system in domain of medical science for diagnosis will increase capability of system.

1.1 Medical Background

As shown in Fig. 1, human body spine is comprised of 33 vertebras and its structure is like numbers of bones arranged in stack. As it is depicted in Fig. 1, lower lumbar spine is made up of five vertebras named as L1–L5. The disks between vertebras are fibrocartilage pads of cylindrical shapes that lie between the vertebral bodies, responsible for giving flexibility and stability to spine.

Aging is unavoidable parameter of human life; during this period, structure of spine undergoes several changes which affect its functionality. In recent studies, it has been observed that heredity and effects of genetic influences play key role in degeneration of disk [6, 7].

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Lecture Notes in Networks and Systems 141

Amit Joshi
Mahdi Khosravy
Neeraj Gupta *Editors*

Machine Learning for Predictive Analysis

Proceedings of ICTIS 2020

Springer

Object Detection with Convolutional Neural Networks

Sanskruti Patel and Atul Patel

Abstract During the last years, a noticeable growth is observed in the field of computer vision research. In computer vision, object detection is a task of classifying and localizing the objects in order to detect the same. The widely used object detection applications are human–computer interaction, video surveillance, satellite imagery, transport system, and activity recognition. In the wider family of deep learning architectures, convolutional neural network (CNN) made up with set of neural network layers is used for visual imagery. Deep CNN architectures exhibit impressive results for detection of objects in digital image. This paper represents a comprehensive review of the recent development in object detection using convolutional neural networks. It explains the types of object detection models, benchmark datasets available, and research work carried out of applying object detection models for various applications.

Keywords CNN · Single-stage object detection · Two-stage object detection

1 Introduction

During the last years, a noticeable growth is observed in the field of computer vision research. Employing machine learning methods provides robust solution to solve computer vision tasks. In computer vision, object detection deals with detecting instances of objects from a particular class in a digital image or video [1]. It is a task of classifying and localizing the objects in order to detect the same. It determines the location where the object is presented in the image and scales one or more objects [2].

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Lecture Notes in Networks and Systems 141

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Deep Learning Methods and Applications for Precision Agriculture

Nilay Ganatra and Atul Patel

Abstract Agriculture is the primary source of basic needs like food, raw material and fuel, which are considered as the basic building blocks for the economic growth of any nation. Agriculture products threatened by various factors including decline in pollinators, various diseases in crops, improper irrigation, technology, scarcity of water and many others. Deep learning has emerged as a promising technique that can be used for data intensive applications and computer vision tasks. It has a great potential and like other domains, it can also apply to agriculture domain. In this paper, a comprehensive review of research dedicated to applications of deep learning for precision agriculture is presented along with real time applications, tools and available datasets. The findings exhibit the high potential of applying deep learning techniques for precision agriculture.

Keywords Deep learning · Convolutional neural network · Precision agriculture

1 Introduction

The research shows that approximately 65% living beings are directly or indirectly depends on the agricultural products. This sector faces various changes to accomplish the needs of growing population which has almost doubled in last 50 years. Increased population and climate changes are considered as the detrimental factors for agriculture to fulfill its necessity. Moreover, the agriculture products threatened by various factors including decline in pollinators, various diseases in crops, improper irrigation, technology, scarcity of water and many others. Pre-emptive measures against

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Atul Patel
Pawan Lingras (Eds.)

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Soft Computing and its Engineering Applications

Second International Conference, icSoftComp 2020
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Springer

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Theory and Methods

Quantile Regression Support Vector Machine (QRSVM) Model for Time Series Data Analysis

Dharmendra Patel(✉)

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Abstract. Analysis of time series information is very interesting as it can be used to understand the past and to forecast the future. Mainly, the data models of the time series are based on the normal least square regression (LSR). For handle the outliers, the least square regression is not efficient. Data from the time series contains outliers in a notable quantity that may affect the results of the prediction. The proposed solution will use statistical techniques of quantile regression that robustly gives insights based on different dimensions as well as treats outliers. The advantage of quantile regression is to discover more useful predictive relationships in situations where there is a poor relationship between independent variables. The paper described the statistics of QRSVM model. The paper dealt experiments based on time series data and proved that QRSVM model is superior than LSR model in insights generations and for outlier handling.

Keywords: Least square regression · Quantile regression · Support vector machine · Time series analysis · Quantile regression support vector machine model

1 Introduction

Time series data is very vital for many applications such as economics, medicine, education, social sciences, epidemiology, weather forecasting, physical sciences etc. to derive meaningful insights at different points in time. Conventional statistics methods have several limitations to deal with time series data so specialized methods known as time series analysis requires predominantly in such cases. The simplest and most popular method is linear least square method. Least square method gives the trend line to best fit to a time series data. It exhibits several advantages:

- It is very simple method to understand and derive the prediction
- It is to be applicable for all most all applications
- It gives maximum likelihood solutions if correlate with Markov Conditions.

However, it suffers from several critical limitations:

- Sensitive towards outliers.
- Data needs to be normally distributed for better results.
- It exhibits tendency of outfit data.

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A Smart Card Based Lightweight Multi Server Encryption Scheme

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Abstract. Due to advancements in connectivity and networking, the Internet has become integral part of our lives. Today, the Internet is used in all spheres of life from health and medicine to finances, education and entertainment. In order to get services from various Internet based platforms users need to prove their identity. A single smart card can be used to prove identity of users to avail services offered by various platforms. This benefit is also a vulnerability of the system. We propose a smart token based scheme for mutual authentication between the user and the service provider. We apply modified Diffie-Hellman protocol to keep the proposed solution lightweight for use over variety of devices.

Keywords: Multi server encryption · Smart card · Smart token

1 Introduction

These days the world is increasingly becoming app oriented. The apps are used for different purposes, starting from purchasing groceries and electronics to financial transactions to health and fitness. While using these apps, users share large amount of personal information that is sensitive in nature. The users receive many services over the internet in response of payment. Currently in India one of the preferred modes of payment for online transactions is by debit card. The usage of debit card for payment serves multiple purposes: 1) from the perspective of issuing authority it is also easier as giving a single card to customer reduces cost of production 2) it keeps your actual account number hidden 3) a single card can be used on multiple platforms for payment towards variety of services 4) since it is just a single card, managing its information is much easier for the user.

A debit card is associated with a single pin. This feature of a single pin makes it very suitable to use for multiple services. A user can use the debit card to pay towards a number of services provided by various platforms on the internet. However, if a user wishes to subscribe to new service, he/she must register with the new platform and provide identity details to the new platform. A debit card can effectively be used in instances such as online grocery shopping, reservation or ticket booking and payment for variety of utilities. A malicious user can keep a close watch on the activities of the user and gather information that can be used to reveal debit card details or such similar confidential information. This can result in misuse of cards or even identity theft. This scenario highlights a major drawback of using a single set of information (debit card details) on multiple platforms. This issue can be addressed with remote authentication.

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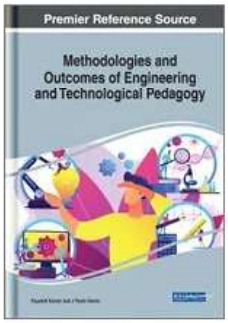

Education in the Era of Industry 4.0: Qualifications, Challenges, and Opportunities

Dharmendra Trikamlal Patel (Charotar University of Science and Technology, India)

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Abstract

Industry 4.0 has changed the thinking of industry owners in terms of technological usage. With the help of modern digital technology, industry can fulfill the requirements of customers easily and compete strongly against their competitors. In order to achieve good quality of products at an affordable price, industry needs skilled people who are aware of autonomous and intelligent components. To prepare skilled people compatible with Industry 4.0, education plays a very important role. The chapter starts with which kind of qualifications are needed to fit in the smart factory era. In next section, the chapter deals with challenges that emerge in education in order to implement skills suitable for Industry 4.0. Lastly, the chapter describes opportunities for the education sector as far as the smart factory is concerned.

Chapter 7
Education in the Era of Industry 4.0: Qualifications, Challenges, and Opportunities

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ABSTRACT

Industry 4.0 has changed the thinking of industry owners in terms of technological usage. With the help of modern digital technology, industry can fulfill the requirements of customers easily and compete strongly against their competitors. In order to achieve good quality of products at an affordable price, industry needs skilled people who are aware of autonomous and intelligent components. To prepare skilled people compatible with Industry 4.0, education plays a very important role. The chapter starts with which kind of qualifications are needed to fit in the smart factory era. In next section, the chapter deals with challenges that emerge in education in order to implement skills suitable for Industry 4.0. Lastly, the chapter describes opportunities for the education sector as far as the smart factory is concerned.

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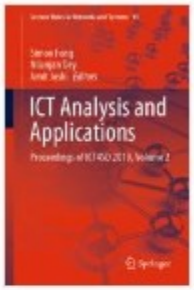

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Learner Performance and Preference Meter for Better Career Guidance and Holistic Growth

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Preface

The Fourth International Conference on ICT for Sustainable Development (ICT4SD 2019) targets theory, development, applications, experiences and evaluation of interaction sciences with fellow students, researchers and practitioners.

The conference may concern any topic within its scope. Workshops may be related to any topics within the scope of the conference. The conference is devoted to increase the understanding role of technology issues and how engineering has day by day evolved to prepare human-friendly technology. The conference will provide a platform for bringing forth significant research and literature across the field of ICT for Sustainable Development and provide an overview of the technologies awaiting unveiling. This interaction will be the focal point for leading experts to share their insights, provide guidance and address participant's questions and concerns.

The conference was held during 5–6 July 2019, at Hotel Vivanta By Taj, Panaji, Goa, India, and organized by Global Knowledge Research Foundation and supported by The Institution of Engineers (India), Supporting Partner InterYIT, International Federation for Information Processing, State Chamber Partner Goa Chamber of Commerce & Industry, and National Chamber Partner Knowledge Chamber of Commerce & Industry.

Research submissions in various advanced technology areas were received, and after a rigorous peer review with the help of program committee members and 56 external reviewers for 519 papers from 8 different countries including Algeria, USA, United Arab Emirates, Serbia, Qatar, Mauritius, Egypt, Saudi Arabia, Ethiopia and Oman, 113 were accepted with an acceptance ratio of 0.11.

Technology is the driving force of progress in this era of globalization. Information and Communication Technology (ICT) has become a functional requirement for the socio-economic growth and sustained development of any country. The influence of Information Communication Technology (ICT) in shaping the process of globalization, particularly in productivity, commercial and financial spheres, is widely recognized. The ICT sector is undergoing a revolution that has momentous implications for the current and future social and economic situation of all the countries in the world. ICT plays a pivotal role in empowering

people for self-efficacy and how it can facilitate this mission to reach out to grassroots level. Finally, it is concluded that ICT is a significant contributor to the success of the ongoing initiative of Startup India.

In order to recognize and reward the extraordinary performance and achievements by ICT and allied sectors & promote universities, researchers and students through their research work adapting new scientific technologies and innovations, the two-day conference had presentations from the researchers, scientists, academia and students on the research works carried out by them in different sectors.

ICT4SD Summit is a flagship event of G R Foundation. This is the fourth edition. The summit was inaugurated by Dr. Pramod Sawant, Chief Minister of Goa, along with other eminent dignitaries including Shri Manguirsh Pai Raikar, Chairperson, Assocham's National Council for MSME; Shri. Prajyot Mainkar, Chairman, IT Committee of Goa Chamber of Commerce and Industry; Mike Hinchey, President, IFIP and Chair, IEEE, UK and Ireland; Milan Tuba, Vice Rector for International Relations, Singidunum University, Serbia; and Shri Amit Joshi, Director, G R Foundation.

Dr. Pramod Sawant shared his views and aim on creating a world-class IT Infrastructure and connectivity for e-governance in the state of Goa. Government is committed to create adequate infrastructure for the industry promotion of e-governance, e-education and streamlining of IT in Goa. He further stated that the infrastructure development and capacity building for promotion of IT is one of the main focus areas.

Shri Manguirsh Pai Raikar, Chairperson, Assocham's National Council for MSME, said that this summit is to provide a common platform and bringing forth significant industries, researches and literatures across the field of ICT for Sustainable Development and provide an overview of the technologies awaiting unveiling along with recognizing and rewarding the extraordinary performance as well achievements by ICT and allied industries, communally.

Shri Prajyot Mainkar, Chairman, IT Committee of Goa Chamber of Commerce and Industry, highlighted and encouraged the entrepreneurship and said that GCCI will continue to support such programmes for larger public benefits with great degree of excellence.

The international dignitaries including Mike Hinchey, President, IFIP and Chair, IEEE, UK and Ireland and Milan Tuba, Vice Rector for International Relations, Singidunum University, Serbia, also highlighted the issues and opportunities in the information processing and education sector.

Macau, China — Simon Fong
Kolkata, India — Nilanjan Dey
Ahmedabad, India — Amit Joshi

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About the Editors

Simon Fong graduated from La Trobe University, Australia, with a 1st Class Honors B.Eng. Computer Systems degree and a Ph.D. Computer Science degree in 1993 and 1998, respectively. Simon is now working as an Associate Professor at the Computer and Information Science Department of the University of Macau, China. He is also one of the founding members of the Data Analytics and Collaborative Computing Research Group at the Faculty of Science and Technology. Prior to his academic career, Simon held various managerial and technical positions, such as systems engineer, IT consultant, and e-commerce director in Australia and Asia. Dr. Fong has published over 300 international conference and peer-reviewed journal papers, mostly in the areas of data mining and optimization algorithms.

Nilanjan Dey was born in Kolkata, India, in 1984. He received his B.Tech. degree in Information Technology from West Bengal University of Technology in 2005, M.Tech. in Information Technology in 2011 from the same University, and Ph.D. in digital image processing in 2015 from Jadavpur University, India. In 2011, he was appointed as an Assistant Professor in the Department of Information Technology at JIS College of Engineering, Kalyani, India, followed by Bengal College of Engineering and Technology, Durgapur, India, in 2014. He is now employed as an Assistant Professor in the Department of Information Technology, Techno India College of Technology, India. He is a visiting fellow of the University of Reading, UK. His research topics are signal processing, machine learning, and information security. Dr. Dey is an Associate Editor of IEEE ACCESS and is currently the Editor-in-Chief of the International Journal of Ambient Computing and Intelligence. He is the Series Co-Editor of Advances in Ubiquitous Sensing Applications for Healthcare (AUSAH), Elsevier, and Springer Tracts in Nature-Inspired Computing (STNIC).

Amit Joshi is a young entrepreneur and researcher who holds an M.Tech. in Computer Science and Engineering and is currently pursuing research in the areas of Cloud Computing and Cryptography. He has six years of academic and industrial

experience at prestigious organizations in Udaipur and Ahmedabad. Currently, he is working as an Assistant Professor in the Department of Information Technology, Sabar Institute in Gujarat. He is an active member of the ACM, CSI, AMIE, IACSIT-Singapore, IDES, ACEEE, NPA, and many other professional societies. He also holds the post of Honorary Secretary of the CSI Udaipur Chapter and Secretary of the ACM Udaipur Chapter. He has presented and published more than 30 papers in national and international journals/conferences of the IEEE and ACM. He has edited three books, on Advances in Open Source Mobile Technologies, ICT for Integrated Rural Development, and ICT for Competitive Strategies. He has also organized more than 15 national and international conferences and workshops, including the International Conference ICTCS 2014 at Udaipur through the ACM-ICPS. In recognition of his contributions, he received the Appreciation Award from the Institution of Engineers (India) in 2014, and an award from the SIG-WNs Computer Society of India in 2012.

Learner Performance and Preference Meter for Better Career Guidance and Holistic Growth

Nilay M. Vaidya and Kanubhai K. Patel

Abstract One of the biggest challenges for higher educational institutes is to increase the placement ratio. Another challenge is to increase the holistic development of the students. Looking at the global requirement, the companies require people not only excellent in the domain knowledge but required excellent in the soft skill too. Finding and predicting the performance factor of the student may help in improving the system and also give an indication to improve pedagogy being offered to students. Many tutoring systems and continuous evaluation patterns adopted by many institutes help in improving the performance of a student. As the trend changes toward holistic development of the students, focus is also upon the soft skills measurement factor. This encouraged us to have a model that helps predicting the holistic performance of a student based on the continuous evaluation as well as performance indicator of a student in other activities too. A gray-based decision-making theory helps assessing the required parameters that find the continuous performance measurement of a learner for each aspect. The multi-attribute situation decision-making theory helps in improving the criticality of the information system by recognizing the sensitivity of the criteria.

Keywords Employability · Grey decision-making · Multi-attribute situation decision-making · Tutoring system

1 Introduction and Related Work

With the revolution in the global market and the rapid development in Information Technology (IT) around, many companies started demanding the candidates with the good technical skill as well as soft skills. Soft skill development becomes one of the important components in good institutes nowadays. Institutes have started applying the different modules to build the soft skill measure among students. But

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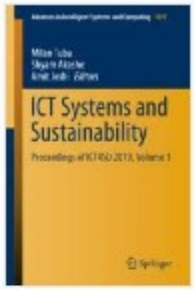

ICT Systems and Sustainability pp 83-89 | Cite as

Enhancing Programming Competence Through Knowledge-Based Intelligent Learning System

Authors | Authors and affiliations

Kanubhai K. Patel, Nilay Vaidya

Conference paper
First Online: 29 February 2020

Advances in Intelligent Systems and Computing

Volume 1077

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Amit Joshi
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ICT Systems and Sustainability

Proceedings of ICT4SD 2019, Volume 1

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Milan Tuba
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people for self-efficacy and how it can facilitate this mission to reach out to grassroots level. Finally, it is concluded that ICT is a significant contributor to the success of the ongoing initiative of Startup India.

In order to recognize and reward the extraordinary performance and achievements by ICT and allied sectors & promote universities, researchers and students through their research work adapting new scientific technologies and innovations, the two-day conference had presentations from the researchers, scientists, academia and students on the research works carried out by them in different sectors.

ICT4SD Summit is a flagship event of GR Foundation. This is the fourth edition. The summit was inaugurated by Dr. Pramod Sawant, Chief Minister of Goa, along with other eminent dignitaries including Shri Manguirsh Pai Raikar, Chairperson, Assocham's National Council for MSME; Shri. Prajyot Mainkar, Chairman, IT Committee of Goa Chamber of Commerce and Industry; Mike Hinchey, President, IFIP and Chair, IEEE, UK and Ireland; Milan Tuba, Vice Rector for International Relations, Singidunum University, Serbia; and Shri Amit Joshi, Director, GR Foundation.

Dr. Pramod Sawant shared his views and aim on creating a world-class IT infrastructure and connectivity for e-governance in the state of Goa. Government is committed to create adequate infrastructure for the industry promotion of e-governance, e-education and streamlining of IT in Goa. He further stated that the infrastructure development and capacity building for promotion of IT is one of the main focus areas.

Shri Manguirsh Pai Raikar, Chairperson, Assocham's National Council for MSME, said that this summit is to provide a common platform and bringing forth significant industries, researches and literatures across the field of ICT for Sustainable Development and provide an overview of the technologies awaiting unveiling along with recognizing and rewarding the extraordinary performance as well achievements by ICT and allied industries, communally.

Shri Prajyot Mainkar, Chairman, IT Committee of Goa Chamber of Commerce and Industry, highlighted and encouraged the entrepreneurship and said that GCCI will continue to support such programmes for larger public benefits with great degree of excellence.

The international dignitaries including Mike Hinchey, President, IFIP and Chair, IEEE, UK and Ireland and Milan Tuba, Vice Rector for International Relations, Singidunum University, Serbia, also highlighted the issues and opportunities in the information processing and education sector.

Belgrade, Serbia — Milan Tuba
Gwalior, India — Shyam Akashe
Ahmedabad, India — Amit Joshi

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Enhancing Programming Competence Through Knowledge-Based Intelligent Learning System

Kanubhai K. Patel and Nilay Vaidya

Abstract Computer programming competence is essential for computer science students. For them, it is challenging to understand computer programming courses easily. It eventually causes a lack of interest in the programming courses. It also impacts on employability of the students. Currently, around 20–30% fresh graduates are only employable and get placed. To overcome the problem, the authors have proposed a framework of Knowledge-based Intelligent Learning System (KILS) which enhance the programming competence of the students and thereby increase their employability. An experiment was conducted on undergraduate and postgraduate computer science students to evaluate the significance of the proposed solution to the problem. The results show that the proposed solution not only enhances their programming competence which ultimately increasing their employability but also improves the students' involvement and attitudes towards programming.

Keywords Knowledge-based learning system · Student learning · Computer programming competence · Student involvement

1 Introduction

A good number of students are taking admission in undergraduate level (such as BCA and B.Sc.(IT)) and postgraduate level (such as MCA and M.Sc.(IT)) computer science programmes. Programming competence is the desired knowledge and skills of students in computer programming-based courses or programmes. For these students, it becomes difficult to understand computer programming courses easily in initial years as it involves the comprehension of theoretical background, practical usage of semantics and syntactic coding and algorithmic skills [1]. It eventually

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Evolving Technologies for Computing, Communication and Smart World pp 69-81 | Cite as

Unsupervised Learning-Based Sentiment Analysis with Reviewer's Emotion

Authors | Authors and affiliations

Harsh Jigneshkumar Patel, Jai Prakash Verma ✉, Atul Patel

Conference paper
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Contents

Unsupervised Learning-Based Sentiment Analysis with Reviewer's Emotion

Harsh Jigneshkumar Patel, Jai Prakash Verma, and Atul Patel

Abstract The sentiment analysis performed using the general methodologies, i.e., lexicon and neural networks based mainly on the content written by the user. They all are mainly content-centric methodologies. The aspect of the user's mindset and sentiment for writing the reviews is never considered and the emotions of the writer. In this paper, we are proposing the consideration of these aspects and their impact. They are accommodated on the basis of the sentiment score of the review written by the user. The intensity of the words used to describe the product or an issue matters significantly in the classification of the product features. Unsupervised learning methods were used to calculate more precise sentence-level sentiments with the help of contextual dependencies. They are more suitable for the aspect-based sentiment analysis as they are found to be more adaptable to different contexts and domains with the change in information rather than changing the entire model structure. The clustering algorithms are used for segregating the different types of groups related to viral sharing of ads. Various factors can be analysed to decide whether the ad is shared by a user or not.

Keywords Sentiment analysis · Text summarisation · Unsupervised learning · Machine learning · Text mining

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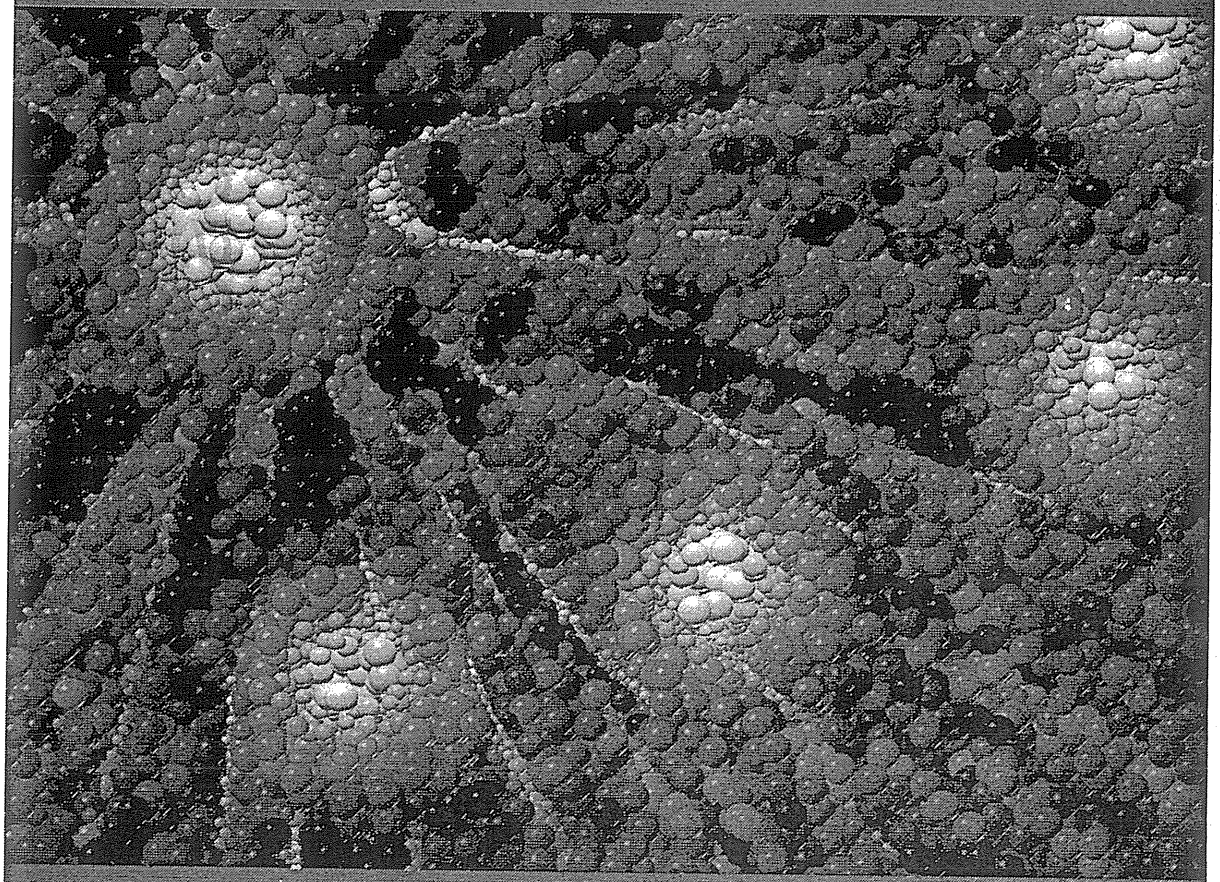
Emerging Technology and Trends

Editor Keka Talukdar



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CHAPTER 3

Application of Magnetic Fluid in the Energy Sector

KINNARI PAREKH[1] and R. V. UPADHYAY[1,2]

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ABSTRACT

In the present chapter, the review of energy applications of magnetic fluid is presented. Few studies mentioning the use of magnetic fluid for voltage generator, energy harvester and energy storage is reviewed; however, the study is yet at the preliminary level and needs focused research with the novel design and synthesis of special magnetic fluid for the purpose. The use of magnetic fluid for energy transfer devices, especially for heat transfer using convection pipe study and automatic cooling devices (ACD) shows potential. A special type of magnetic fluid, known as temperature-sensitive magnetic fluid (TSMF) can be used to achieve enhanced heat transfer. Results published in the literature are reviewed and presented in this article. However, the work is still, to the author's knowledge, is the tip of an iceberg. The motive to write this article is to explore the potential benefits of magnetic fluid in the energy sector as well as to spread awareness in the field of heat transfer.

3.1 INTRODUCTION

The energy sector is highly influenced by the need of magnetic materials as they play a vital role in improving the functioning of devices especially

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Maulin P. Shah *Editor*

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Contents

Dyes: Effect on the Environment and Biosphere and Their Remediation Constraints

3

Kunal Jain, Chirayu Desai, Onkar Tiwari, and Datta Madamwar

Abstract

The early excitement of industrialization during the twentieth century and unprecedented population rise have now compelled us to think about developing environmental remediation strategies on a priority basis to save the basic essential components of life. Understanding the impact of dyes and dye intermediates which have been the major component of industrial pollutants in the environment is the prime need, to reclaim the pristine environment. Physical and chemical environmental cleanup technologies developed for dye and textile effluents are proven to be expensive and energy consuming, often generate toxic by-products, and more importantly are faced with limited success in a narrower scope. Consequently, the need for an alternate approach has led to the development of self-sustainable, greener biological methods (i.e., bioremediation). It offers a great advantage of astonishing catabolic diversity of the innate microbial population inhabiting the polluted environment. Factors like geological aspects, climate, soil and water characteristics, waste and disposal facilities, etc. play a vital role in the success of different technologies (including bioremediation). Besides chemical structure, degree of recalcitrance, toxicity, and bioavailability of dye molecules are considered significant parameters for their treatments. In this review, an attempt has been made to understand the complexities and constraints of existing technologies and few optimistic scenarios to improve and develop new methodologies for treatment of industrial effluents from dye and textile industries.

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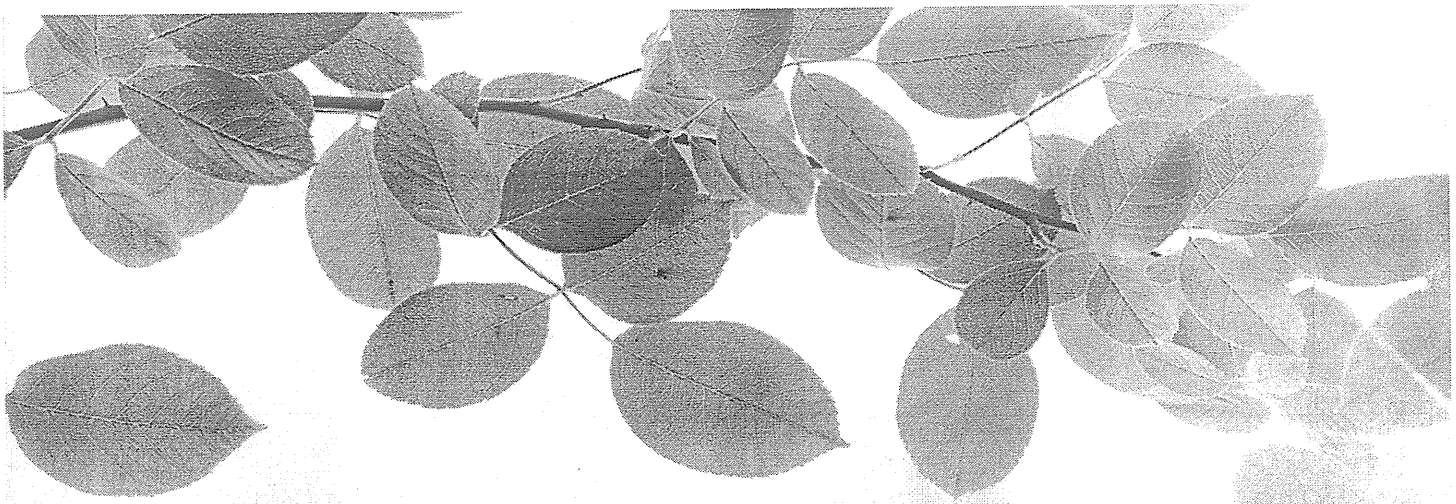

Emerging Technologies in Environmental Bioremediation

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CHAPTER 5

Emerging bioremediation technologies for the treatment of wastewater containing synthetic organic compounds

Kunal Jain[1], Jenny Johnson[1], Neelam Devpura[1], Rohit Rathour[2], Chirayu Desai[2], Onkar Tiwari[3] and Datta Madamwar[1]

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5.1 Introduction

Ever since the evolution of human beings, tools and machinery have coevolved with them. The coevolution of human life and technology development has provided much required technical edge for their survival and sustenance during their early life on the Earth. Initial inventions, which might have been accidental discoveries, paved the way for modern industrial revolutions. With the rise in human populations the need for technologically driven life also increased proportionately and we did not realize when our environment started to lose its pristine nature. The modern industrial revolution marked a significant point in human history, since when the ease of human life on Earth has exponentially increased. The change also brought changes in the biosphere, for which humans were not prepared and had not anticipated where it would rapidly create situations where the basic entity of life is in danger.

Human activities have damaged and polluted the natural terrestrial, aerial, and aquatic ecosystems at the same pace and with same intensity. In recent years environmental pollution has become a priority problem globally. It has changed drastically and been compounded with the daily transformations in the habits, lifestyles, and ever-rising living standards of humans. The major impact on the pristine environment was made by synthetic organic compounds (SOCs). The SOCs are often an intimation of natural organic compounds, that historically were derived from naturally occurring materials (petroleum, natural gas or coal). From the latter part of the 20th century natural organic compounds

Emerging Technologies in Environmental Bioremediation.
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Plant Small RNA

Biogenesis, Regulation and Application

Edited by
Praveen Guleria
Vineet Kumar

Plant Small RNA
Biogenesis, Regulation and Application

Edited by

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CHAPTER

Challenges of small RNA technology

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Ravi K. Singh[a,*], **Annangarachari Krishnamachari**[b], **Murali Sharaff**[c]

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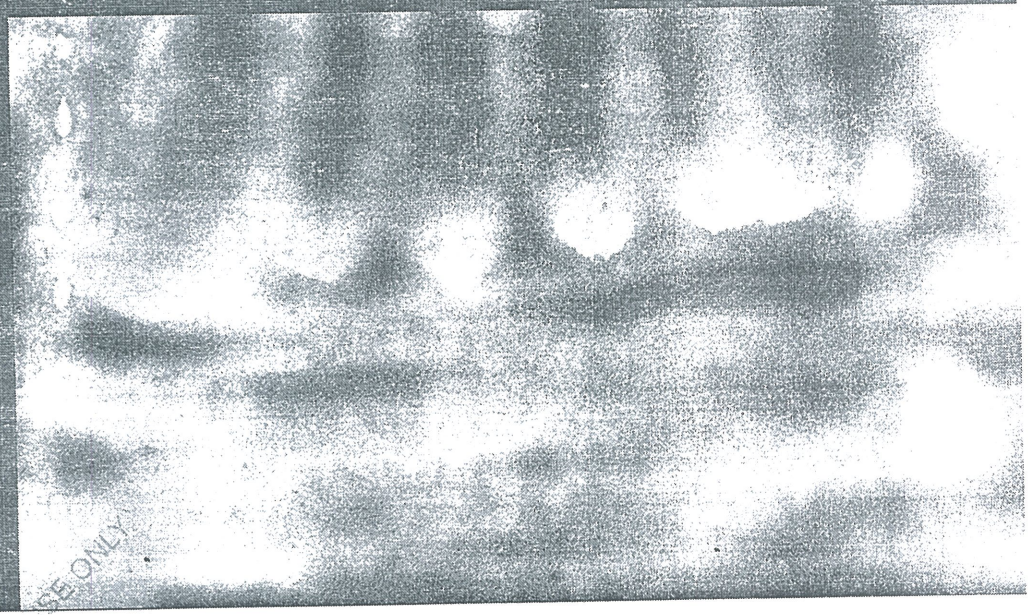
Small RNAs in plants: An expanding world

Small RNAs are the ubiquitous components of cellular transcriptomes. Most of these small RNAs are non-coding, regulatory RNAs that range from ~17 to 33 nucleotides in length in eukaryotes [1, 2]. Non-coding small RNAs play essential roles in complex biological processes across the tree of life. These non-coding small RNAs have emerged as critical regulators of important genomic functions, such as transcription, translation, chromatin structure modifications, etc. [3, 4]. Here, small RNAs act to guide the effector protein, Argonaute (AGO), to target gene sequence, such as mRNA, via base-pairing interactions [5].

Plant genomes encode a plethora of small RNAs. The diversity in small RNAs and its abundance varies among plant species [3, 6]. High-throughput sequencing technologies further enabled the expansion and diversity in small RNAs population, with the discovery of novel small RNA species in various cells and tissues at different stages of development, and in response to various stress conditions [2, 7]. Based on their mode of biogenesis, plant small RNAs are broadly classified into microRNAs (miRNAs) and small interfering RNAs (siRNAs) [1, 8]. miRNAs are synthesized from their respective genes, whereas siRNAs may come from different sources such as aberrant transcripts, trans-acting silencing genes, overlapping genes, or heterochromatin, and are therefore further classified into different types such as trans-acting siRNAs (ta-siRNAs), natural antisense RNAs (nat-siRNAs), and heterochromatic siRNAs (hc-siRNAs), respectively. The miRNAs are transcribed as a primary transcript (pri-miRNA) in an RNA pol-II-dependent manner in the nucleus.

Plant Small RNA. https://doi.org/10.1016/B978-0-12-817112-7.00024-9

This book focus upon AFM working principle, its different modes (i.e., contact, non-contact and tapping modes), analysis of some AFM result and few applications also. this book also underline the features of AFM as high versatile and useful morphological tool to scan a large variety of surfaces, with a planar resolution ranging from nano –meter sclae down to atomic scale. We hope this book may helpful to researcher and student to understand the basic concept of AFM as well as performing with it for different kind of samples.



Dr. Vanarajsinh Solanki
Dr. Abhay Dasadiya
Dr. Pramita Mishra

Atomic Force Microscopy Fundamentals and Applications

Dr. Vanaraj Solanki had earned his master(M.Sc) in physics (2008) from S. P. University, VVNagar, and Ph.D from Institute of Physics, Bhubaneswar, India. He has also worked at Materials Research Centre, Indian Institute of Science, Bangalore, during his postdoc. Presently, Dr. Solanki is working as a Research Scientist at, KRADLE, CHARUSAT, Changa.

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Dr. Vanarajsinh Solanki
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Atomic Force Microscopy Fundamentals and Applications

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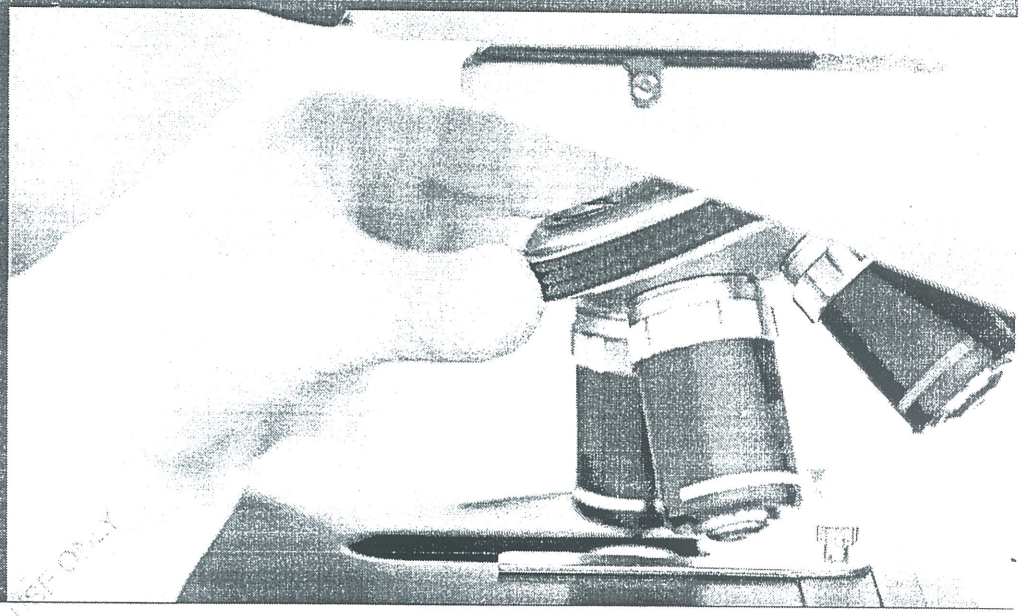
1. INTRODUCTION

In recent years, nanostructured materials have gained immense attention of the researchers as they exhibit a variety of fascinating and useful properties with many technological implications [1-4]. With frontier research in many areas getting guided by nano-dimensional science and technology, their fundamental understanding and application regimes demand the immense attention that this field is receiving. For nano-scale (~1-100 nm) objects the larger active surface area and modified properties, which differ significantly from their bulk, control many aspects of their behaviour [1, 2]. Consequently, their characterization roots gain high significance [1-6], in addition to their. The goal is to provide good control on understanding the nanostructures structurally, morphologically, electronically etc. Amongst different analyzing tools, Atomic Force Microscope (AFM), type of scanning probe microscope (SPM), is a powerful technique to investigate the materials morphologically at nanometer scale [5].

Microscopy is the most important and widely used instrument for morphological characterization in different fields that includes material science, bio-logical research etc. [5-6]. An Optical microscope, based on the transmission of light supported by different glasses and lenses based system, has been greatly used for the investigations of morphological properties at micrometer scale. In the last century, the great effort of various researchers and engineers have promoted to the development of scanning and transmission electron microscopy (SEM and TEM) which are based on interaction mechanisms of electrons with the matter. These systems are capable to resolve the nanostructure, thus provide the further morpho-structural details at sub-micrometric and nanometric scale [7].

This book focus on different material characterization tools focusing on morphology/topology and structural properties of the materials. In the chapter related to morphological characterization tools the book mainly discussed Transmission Electron Microscope (TEM), Scanning Electron Microscope (SEM), and Atomic Force Microscope (AFM) whereas structural characterization chapter includes the details of X-ray Diffractometer (XRD), Neutron diffraction, Raman Microscope, Selected Area Electron Diffraction (SAED). Here, we have tried our best to explain each detail of the experimental techniques which will be very helpful to new learners.



Dr. Vanarajsinh Solanki
Dr. Abhay Dasadia
Dr. Pramita Mishra

Experimental Techniques for Material Characterization-Part-1

Dr. Vanaraj Solanki had earned his masters in physics (2008) from S. P. University, VVNagar, and Ph.D from Institute of Physics, Bhubaneswar, India. He has also worked at Materials Research Centre, Indian Institute of Science, Bangalore, during his postdoc. Presently, Dr. Solanki is working as a research Scientist at, KRADLE, CHARUSAT, Changa.

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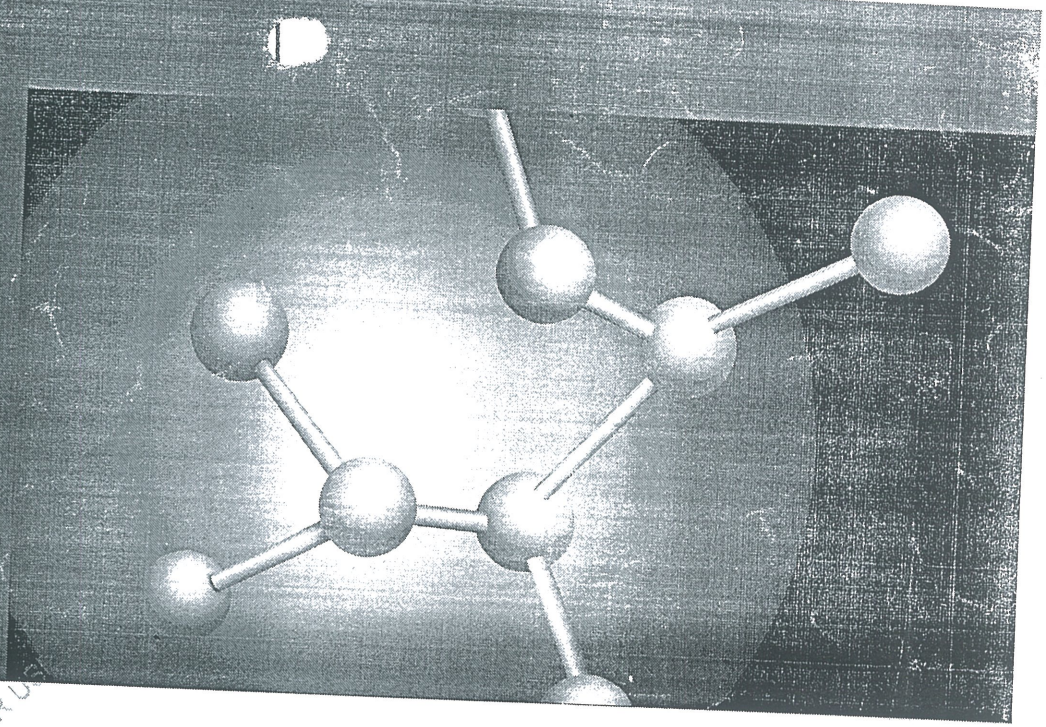
The X-ray diffraction is a useful tool for research work and different types of analysis like powder analysis, texture analysis, stress analysis, single crystal analysis, high-resolution analysis. All of these studies are under nondestructive testing.This book emphasizes on structure determination techniques of transition metal chalcogenides using x-rays diffraction. Work presented in book mainly describes the use of Powder X-ray Diffraction (PXRD) and single crystal diffraction calculations for the determination of crystal structure for transition metal chalcogenides.



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Abhay Dasadia
Vanaraj Solanki
Brinda Nariya

Structure Determination of Transition Metal Chalcogenides

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Abhay Dasadia
Vanaraj Solanki
Brinda Nariya

Structure Determination of Transition Metal Chalcogenides

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CONTENTS

The book gives the in depth understanding of crystal growth of transition metal trichalcogenide crystals by vapor transport method. Book also summarize the analytical techniques for the determination of some structural, optical and electrical properties of crystals. It also gives brief concept of high pressure study on electrical resistivity measurements of the transition metal trichalcogenide crystals.

Crystal growth and Characterizations

Dr. Abhay Dasadia did M.Sc. (Solid State Physics) in 2008, M.Phil in 2009 an Ph.D (Crystal Growth) in 2013 from Department Of Physics, S.P.University, Vallabh Vidyanagar, Gujarat, India. Presently, he is Assistant Professor of Physics at A.D.Patel.Institute of Technology, New Vallabh Vidyanagar, Gujarat, India.

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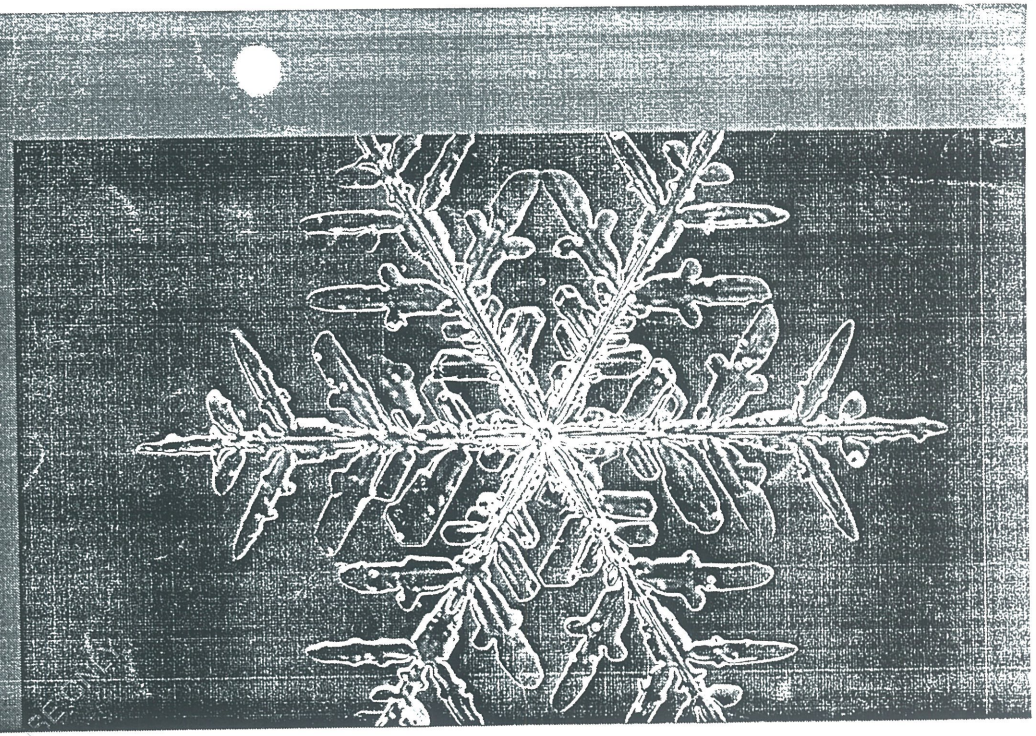

Abhay Dasadia
Vanraj Solanki

Growth and characterizations of transition metal trichalcogenides

Crystal growth by vapor transport and some analytical techniques for transition metal chalcogenides

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Vanraj Solanki

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1.1 INTRODUCTION

Among the many semiconducting material investigated for photovoltaic solar-cell applications, e.g. Si, CdS, CdTe, CuInSe2, [1-2] and GaInP/GaAs/Ge for tandem cells, [3] transition-metal dichalcogenide TMDC materials have attracted a remarkable degree of attention due to their comprehensive potential properties. They are cheap and abundant, available in both n- and p-type forms, have energy-band gaps well suited to solar energy conversion, a high absorption coefficient in the visible range, the tendency to grow a thin films, and they are nontoxic materials. These superior properties qualify them as potential candidates for photovoltaic applications. Zirconium dichalcogenides showed the possibility to be used in solid state solar cell technology and devices; they also exhibit some interesting switching and memory effects [4]. For the reported chalcogenides, almost all main group metals cooperate with the element of group 16 (S, Se, Te) and alkali, alkaline-earth metals or rare-earth elements to form multinary chalcogenides [5].

The compounds of these materials have the common formula MX2 where M is a transition metal of groups IVb, Vb, VIb and X is one of the chalcogens S, Se or Te. The most striking feature of these compounds is that they crystallize in quasi-two-dimensional structure consisting of a sheet of metal atoms sandwiched between two sheets of chalcogens forming X-M-X layers with strong mixed covalent ionic intra-layer bonding while the inter-layer bonding is one of the relatively weak van der Waals type. This two-dimensional bonding behavior is responsible for the marked anisotropy in a number of their physical properties. Several studies on the structure [6] optical [7-8] and electronic properties [9-11] have been performed for these layer-type structure compounds.

Extending this project to the ternary systems, we have grown needles of new ternary transition metal chalcogenides phase of ZrSTe. To the best of our knowledge, no structural report is available on ZrSTe single crystal. Here we are reporting single crystal X-ray diffraction data of ZrSTe. Structure shows twisted two dimensional zigzag chain of Zr-Te parallel to c-axis. Earlier author has already reported growth and electrical properties of ZrSTe [12].

The trichalcogenides of the group IV-B transition metals form an interesting class of isostructural chain compounds, which crystallize with the ZrX_3 type structure [13-14]. The comparatively low symmetry and their large number of crystallographically different atoms contained in the primitive cell, lead to 21 k=0, non degenerate, optical phonons transforming as the irreducible representations of the C_{2h}^2 point group. These long wave length vibrational states of the binary compounds and their ternary derivatives have been extensively investigated by means of Raman and infrared spectroscopic method [15-18]. Different models [19] for representation of the inter atomic forces have been proposed on account of the experimental data and to estimate the degree of inter chain coupling in these compounds. Transition-metal trichalcogenides of the ZrS_3

Chapter-1

Information about Transition Metal Chalcogenide crystals

CHAPTER 6
UV-Vis-NIR SPECTROSCOPY OF TRANSITION METAL TRICHALCOGENIDES

Chapter-1

Information about transition metal trichalcogenide Single crystals

1.1 INTRODUCTION

The most striking feature of these compounds is their structure, that can be classified into three type, depending on the number of different MX_3 chains present in the unit cells. Recently, the transition metal trichalcogenides of group IVB, VB and VIB have received much more attention because of the considerable diversity in their physical properties [1].

The electronic structure of these compounds is of considerable interest both from the experimental and theoretical points of view. They possess a pseudo one-dimensional structure, where there is an infinite chain of trigonal prismatic (MX_6) units, extending parallel to the b-axis and share upper and lower faces. The chains with strong ionic covalent (or metallic) bonding are separated by a relatively large distance and bonding among such chains is weak. Thus a and c planes perpendicular to the chain axis in MX_3 crystals are more compressive than others. In addition, the chain type structure, in MX_3 results in the formation of intercalation compounds. These compounds also exhibit superconductivity and charge density wave phenomena. Transition metal trichalcogenides, MX_3, (M is a transition metal of group IVB, VB and VIB where X is a chalcogen) constitute structurally and chemically well defined family of compounds. These trichalcogenides are thin fibrous ribbons and offer several interesting phenomena originating from their strong anisotropy.

The chemical bonding processes in transition metal trichalcogenides are of interest because, as opposed to the dichalcogenides, they may involve either single chalcogen atoms or paired-chalcogen legends. Layered transition metal dichalcogenides have been studied in past years [1-2] but few data are available for transition metal trichalcogenides. This is due to the difficulty of growing large size and good quality crystals of the MX_3 compounds.

The comparatively low symmetry and their large number of crystallographically different atoms contained in the primitive cell, lead to 21 k=0,

VACUUM TECHNOLOGY FUNDAMENTALS FOR BEGINNERS

This book mainly focusing on basic of vacuum technology. We have discussed preliminary definitions that are useful for students to understand the basic of vacuum. In addition, book describing the detailed working of few selective vacuum pumps and gauges which are commonly used in most of the scientific instruments. First chapter of the book is mainly about definitions used in the subject whereas second chapter is about process to crate vacuum, details of different pumps and their working. Third chapter of the book focus on ways of measuring order of vacuum with the help of different vacuum gauges. Finally, we have summarize the book in last chapter. We believe this basic book will be helpful to those students who are in their initial stage of vacuum learning.

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VACUUM TECHNOLOGY FUNDAMENTALS FOR BEGINNERS

VANARAJ SOLANKI, PRAMITA MISHRA, RUCHITA PATEL

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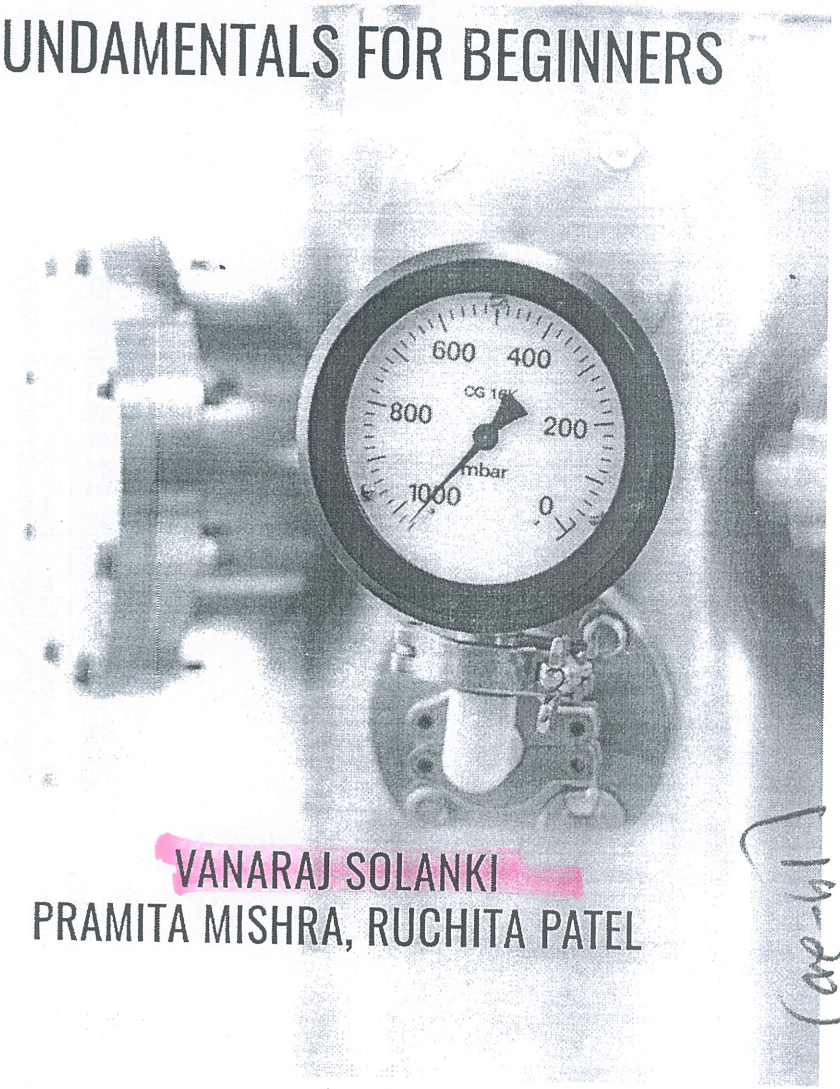

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1. INTRODUCTION

What is Vacuum or Ultra high vacuum?

The vacuum means "absence of matter" or "an empty area or space". In other words, space that is essentially empty of matter, such that its gaseous pressure is much less than atmospheric pressure. The word vacuum comes from the Latin term for empty," but in reality, no volume of space can ever be perfectly empty. A perfect vacuum with a gaseous pressure of absolute zero is a philosophical concept that is never observed in practice. Physicists often discuss ideal test results that would occur in a perfect vacuum, which they simply call "vacuum" or "free space" in this context, and use the term partial vacuum to refer to real vacuum.

The quality of a vacuum refers to how closely it approaches a perfect vacuum. The residual gas pressure is the primary indicator of quality, and is most commonly measured in units called torr.

Ultra high vacuum (UHV) is the vacuum regime characterized by the pressures lower than about 10^{-9} mbar(10^{-9} torr). UHV requires the use of special materials in creating the vacuum system, extreme cleanliness to maintain the vacuum system, and baking of the entire system to remove water and other trace gases that adsorb on the surfaces of the chamber. At these low pressures (LP) the mean free path (MFP) of a gas molecule is approximately 40 km, so gas molecules will collide with the chamber walls many times before colliding with each other. Almost all interactions therefore take place on various surfaces in the chamber.

Remedial Mathematics
in
B. Pharm.

This book gives detail information on some aspects of Remedial Mathematics. The fundamental concepts: Logarithm, Function, Limit, Continuity, Matrices, Determinant, Differentiation, Analytical Geometry, Integration, differential equation, and Laplace transform, that will be beneficial for undergraduate students in Pharmacy. Moreover, this book builds a bridge for Pharmacy students to understand the basics of every mathematical concept. Also, this book will be helpful to researchers in Pharmacy.

Dr. Jimit R. Patel is working as an assistant professor at P. D. Patel Institute of Applied Sciences, Charotar University of Science and Technology since 2017. He has six-year teaching and ten years of research experience. His specialization is in applied mathematics. He published 35 research papers in reputed national and international Journals.

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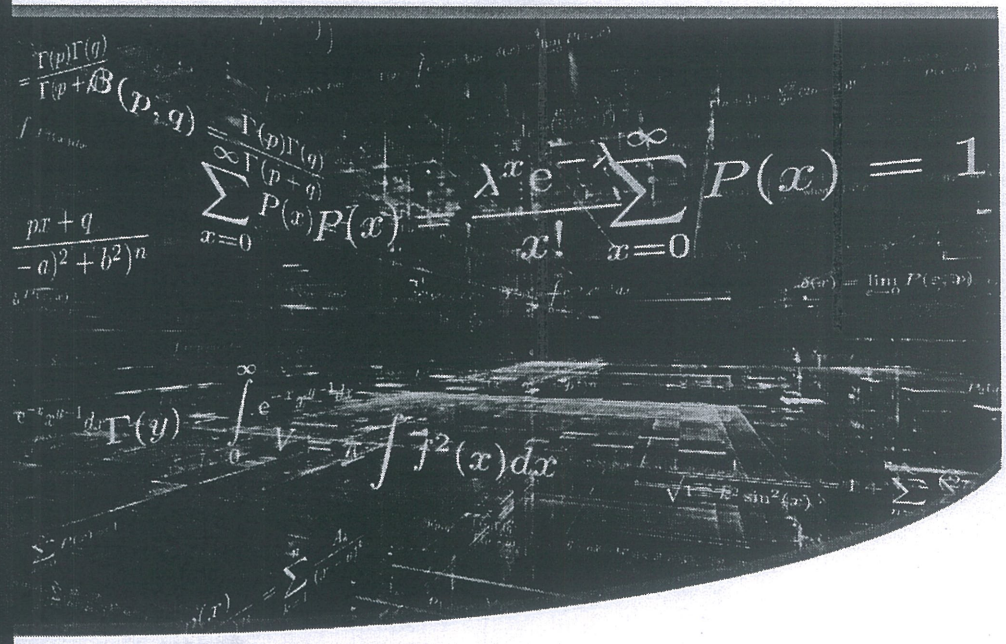

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B. Pharm.

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5	C. K. Sumesh, Sanni Kapatel and Arti Chaudhari		An approach for scalable production of Silver (Ag) decorated WS2	AIP						
6	P. C. Vinodkumar, Tanvi Bhavsar, Manan Shah		Spectroscopy and decay properties of $s\bar{s}$ mesons using Martin -like confinement potential	Proceedings of the DAE-BRNS Symp. on Nucl. Phys.	62nd DAE-BRNS SYMPOSIUM ON NUCLEAR PHYSICS	National	43093	818372081-X	PDPIAS	DAE-BRNS
7	Tanvi Bhavsar, Manan Shah, P. C. Vinodkumar		A relativistic quark model for T2cs	Proceedings of the DAE-BRNS	BRNS SYMPOSIUM ON	National	43093	818372081-X	PDPIAS	DAE-BRNS
8	Manan Shah, Tanvi Bhavsar, P. C. Vinodkumar		S-wave spectroscopy and Hyperfine splitting of Bc meson	Proceedings of the DAE-BRNS Symp. on	BRNS SYMPOSIUM ON NUCLEAR	National	43093	818372081-X	PDPIAS	DAE-BRNS
9	Tanvi Bhavsar, Manan Shah, P. C. Vinodkumar		Pseudoscalar Charmonia Masses And Its Digamma Decay Width With QCD Correction	AIP	INTERNATIONAL CONFERENCE ON CONDENSED MATTER AND	INTERNATIONAL	May-18	978-0-7354-1648-2	PDPIAS	AIP

Remedial Mathematics
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3.4.6.1: Total number of books and chapters in edited volumes / books published, and papers in national/international conference-proceedings year wise during the last five year

Sl. No.	Name of the tea	Title of the book/chapter s published	Title of the paper	the proceedin gs of the	Name of the conference	National / Internatio nal	Year of pu	number of the proceedin	Institute at the time of	Name of the publisher
1	Rekha C. Akhani, Arti T. Patel, Manisha J. Patel, Samir R. Dedania and Darshan H. Patel		Column chromatography free purification of recombinant α-amylase from Bacillus licheniformis by tagging with hydrophobic Elastin Like Polypeptide	Proceding s of National Academy of Science India Section B						
2	Krunal B. Kachhia, Praveen Agarwal and Jyotindra C. Prajapati	~~M., Cho Y., Agarwal P., Area I. (eds)~~ Advances in Real and Complex Analysis with Applications. Trends in	Certain Image Formulae and Fractional Kinetic Equations Involving Extended Hypergeometric Functions			Internatio nal	42992	978-981-10-4336-9	PDPIAS	Birkhäuser, Singapore
3	Jain K, Desai C, Madamwar D	Metal-Microbe Interactions and Bioremediatio n, CRC Press, Taylor & Francis	Bacterial interactions with chromium and strategies for remediation of hexavalent chromium pollution	NA	NA	Internatio nal	4-7-2017	9.78E+12	PDPIAS	Taylor & Francis Group

1 PARTIAL FRACTION, LOGARITHMS, FUNCTIONS, LIMITS AND CONTINUITY

In, this chapter, we will discuss four fundamental concepts of calculus [1,2], namely: Partial Fraction, Logarithms, Functions and Limits, and Continuity.

Partial Fraction

We are familiar with the method of Least common multiple (LCM) of denominators of the Fraction to combine the number of fractions into a single. In this section, we will see the converse process from it i.e., separate fractions. The partial Fraction is a converse process that is splitting up of a given fraction into some simpler fractions.

Polynomial:

An algebraic expression of the form $f(x) = a_0 + a_1x + a_2x^2 + \ldots + a_nx^n$ is called a polynomial in x with $a_n \neq 0, a_1, a_2, \ldots a_n$ are real numbers and x is an unknown variable. The highest power of x in the algebraic expression that exists is called the degree of the polynomial.

Ex: 1. $f(x) = x^4 + 2x^3 + 3x^2 + 4x + 5$ is a polynomial with degree 4 and $a_0 = 5, a_1 = 4, a_2 = 3, a_3 = 2, a_4 = 1$
2. $f(x) = 2x^3 + x + 1$ is a polynomial of degree 3 with $a_0 = 1, a_1 = 1, a_2 = 0$ *and* $a_3 = 2$

Rational Fraction:

The quotient $\frac{P(x)}{Q(x)}$ of two polynomials $P(x)$ and $Q(x) \neq 0$ is called a rational fraction.

e.g., Consider $P(x) = x^2 + 1$ and $Q(x) = x^3 + 2x^2 + 3x + 1$ so $\frac{P(x)}{Q(x)} = \frac{x^2+1}{x^3+2x^2+3x+1}$

Proper and Improper Fractions:

- The rational Fraction $\frac{P(x)}{Q(x)}$ is a proper fraction, if the degree of the numerator $P(x)$ is less than the degree of the denominator $Q(x)$.
- The rational Fraction $\frac{P(x)}{Q(x)}$ is an improper fraction, if the degree of the numerator $P(x)$ is greater than or equal to the degree of the denominator $Q(x)$.

Ex: 1. $\frac{P(x)}{Q(x)} = \frac{x+1}{x^2+1}$ (Proper)

2. $\frac{P(x)}{Q(x)} = \frac{x^2+1}{x^2+1}$ (Improper)

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14	Mitesh Patel, Sanjay Panjabi, Vaibhav Patel	Book: Instrumentation Technique used for Nanomaterial Characterization		PDPIAS	Educreation Publishing	International	2019	ISBN: 978-620-0-21841-4	PDPIAS	Lambert Academic publishing
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16	Kunal Jain, Chirayu Desai, Onkar Tiwari and Datta Madamwar	Chapter in the Book: Microbial Bioremediation & Biodegradation	the Environment and Biosphere and Their Remediation Constraints (doi:https://doi.org/10.1007/97	PDPIAS	Elsevier	International	##########	978-981-15-1812-6	PDPIAS	Springer Nature Singapore Pte Ltd.

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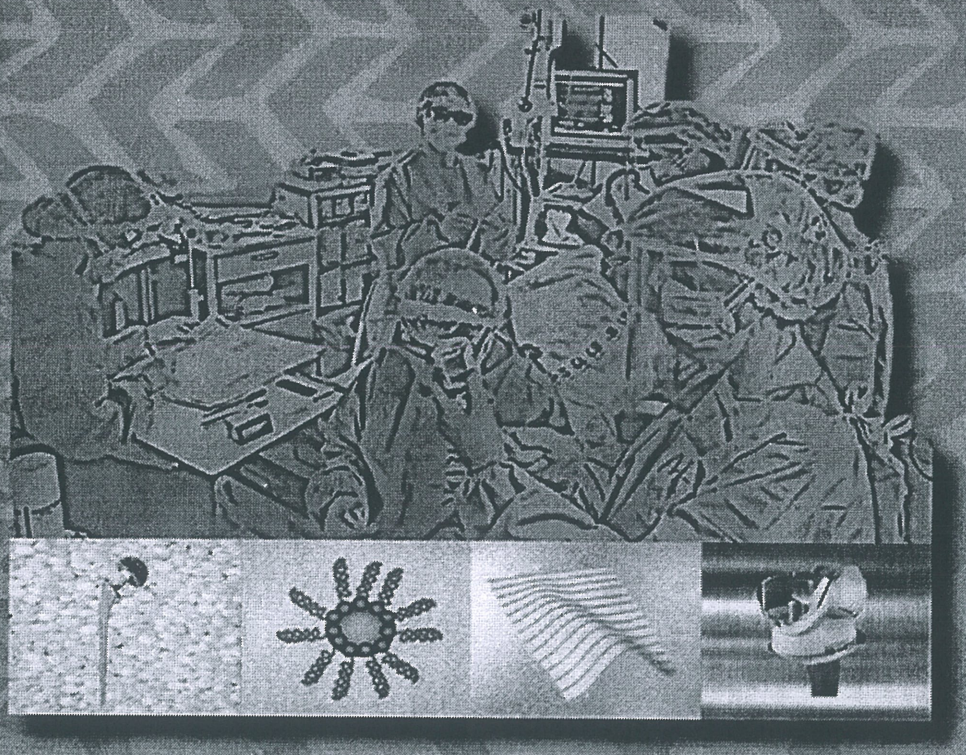
Future Materials for Biomedical Applications



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3.4.6 Number of books and chapters in edited volumes published per teacher during the last five years (15)

3.4.6.1: Total number of books and chapters in edited volumes / books published, and papers in national/international conference-proceedings year wise during the last five year

Sl. No.	Name of the te	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of pub	number of the proceeding	Institute at the time of publication	Name of the publisher
1	Patel K, Goswami D, Dhandhukai P and Thakker JN	Book Chapter in Book : Microbes in action " Industrial Microbiology"	Microbial Carotenoids: Properties, Physicochemical factors for fermentation, Biosynthesis and Applications (Chapter 7)	NA	NA	International	9-1-2016	978-1-63484-520-5	PDPIAS	Nova Science, USA
2	Goswami D, Dhandhukia P and Thakker J N	Book chapter in a Book: Bacilli and Agrobiotechnology	Book chapter entitled Expanding the Horizons for the Use of Paenibacillus Species as PGPR for Sustainable Agriculture	NA	NA	International	#########	978-3-319-44409-3	PDPIAS	Springer
3	Tanvi Bhavsar, Manan Shah, P. C. Vinodkumar	NA	Status of Zc (4050), Y(4140) and Y(4360) states as mixed P wave states of charmonium	Proceedings of the DAE-BRNS Symp. on Nucl. Phys.	61st DAE-BRNS SYMPOSIUM ON NUCLEAR PHYSICS	National	12-9-2016	818372079-X	PDPIAS	DAE-BRNS
4	P. C. Vinodkumar, Manan Shah, Tanvi Bhavsar, Bhavin Patel	NA	Mass spectra of Charmonia using Martin-like potential in a Relativistic Dirac formalism	Proceedings of the DAE-BRNS Symp. on Nucl. Phys.	61st DAE-BRNS SYMPOSIUM ON NUCLEAR PHYSICS	National	42626	818372079-X	PDPIAS	DAE-BRNS

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11	Manan Shah, Tanvi Bhavsar, P. C. Vinodkumar		Doubly heavy baryon in the relativistic quark model		DAE International Symposium on Nuclear Physics	https://www.scopus.com/sourceid/17800			PDPIAS	
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Chapter 7

Application of Biopolymeric Electrospun Nanofibers in Biological Science

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Abstract

Biopolymers are those class of macromolecules which are found in nature or extracted from the living organisms. Various structures and properties of the biopolymers-based materials are well researched till to date. These mainly includes hydrogels, bio glasses, bio inks, biocomposites, fibers and others. These biopolymers-based structures have some limitations. However, Biopolymers have some common advantages (i.e., non-toxicity, easy availability, monodispersity, degradability, and better solubility etc.) and disadvantages (i.e., poor thermal and chemical stabilities, brittleness etc.). To overcome these disadvantages, it is necessary to tailor these polymers by few emerging techniques like "Electrospinning". Electrospinning is one of the easiest techniques to prepare nanofibers from polymeric solutions by applying high voltage. Obtained nano/micro structural polymeric fibers have good properties like high surface area, porosity and low weights etc. The materials having high surface area and porosity can easily interact with cells and tissues, are better mobile vehicles for drugs, as well as possess good filtration and adsorption abilities. Thus, these one-dimensional structures of the biopolymers are very useful in various fields of biomedical especially water sanitation/desalination, tissue engineering, drug delivery and scaffolds. Various biopolymers like chitosan, chitin,


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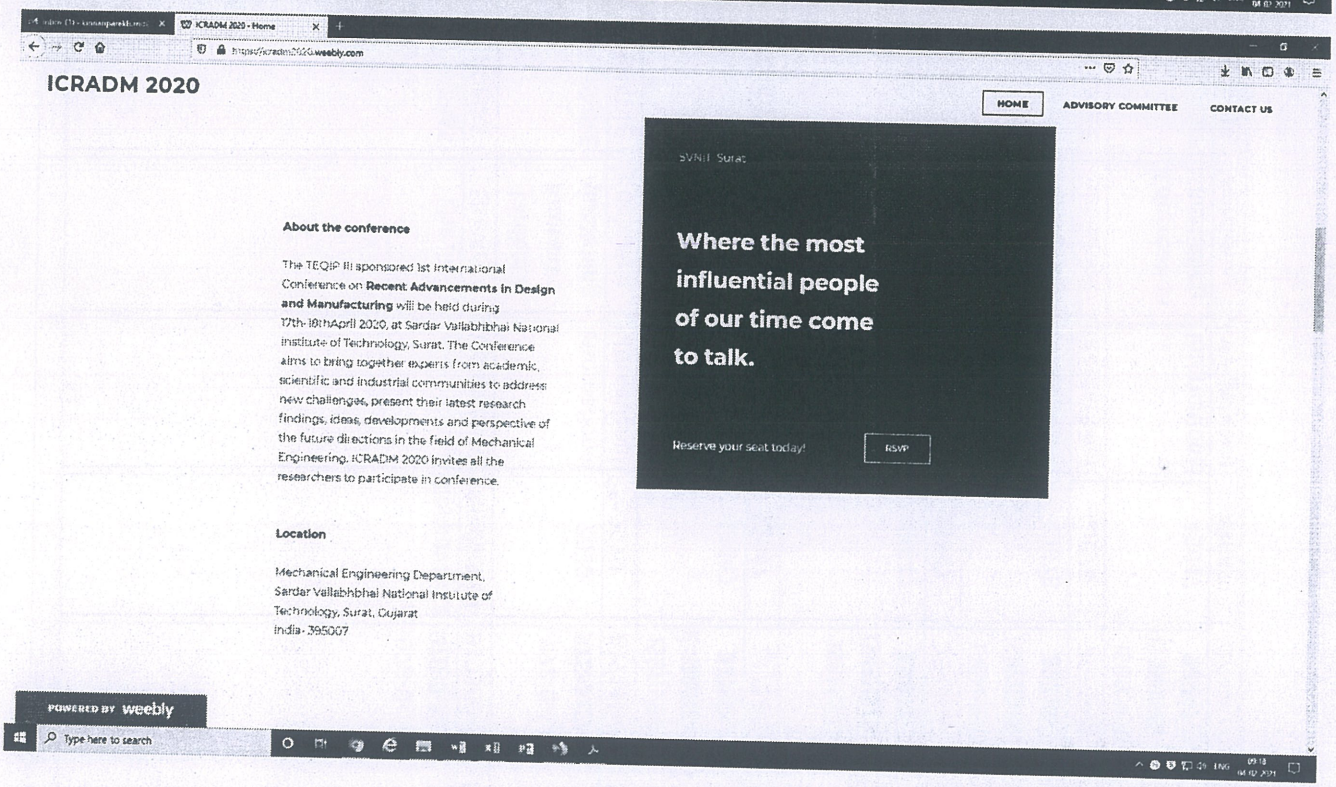
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18	Ravi K Singh, Krishnamachari A, Murali Sharaff	Plant Small RNA:Biogenesis, Regulation and Application	Challenges of small RNA technology	KRADLE	Lambert Academic publishing	International	2020	978-0-12-817112-7	PDPIAS	Elsevier
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Shear Mode Damper Testing Using Flake Shape Based Magnetorheological Fluids

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Abstract: Use of anisotropic iron particles in the synthesis of magnetorheological (MR) fluid having a high yield stress is a challenge as it increases the viscosity of the fluid in off-state. In this clause, a novel flake shaped iron powder based MR fluid with high yield stress is synthesized and used in shear mode MR damper (SMMD). MR damper design is optimized using fluid properties and Bingham model. Damping performance of newly synthesized MR fluid damper is at par with the available friction based damper used in front loaded washing machine. The unique feature of this design is minimal volume of the fluid (1.5 ml) required to achieve damping force of 50N. Performance of the damper is also evaluated with different volume fraction particles based MR fluid. MR damper performance is also evaluated for stroke length and frequency of excitation in this work. Effect of settling of particle on damper performance is discussed in this work. It shows that the flakes shaped-based MR fluid show better stability against gravity. The smaller quantity of present flake shaped-based MR fluid will reduce the cost of shear mode damper.
Keywords: Magnetorheological Fluid; Flake shaped particle;

1. Introduction

By using passive damper between structure and delicate equipment, it is possible to take in either shock (high damping) or vibration (low damping) during normal operation. Therefore, research was concentrated on developing active dampers for vibration isolation [1]. Semi-active damper utilizing Magnetorheological (MR) fluids also can be used for this requirement. The MR fluids are colloidal dispersions of micro-sized multi-domain magnetic particles that go through a striking alteration in their rheological, magnetic and mechanical properties when a magnetic field is used [2,3]. MR effects (rheological properties) in the MR fluid has found numerous applications like MR shock absorbers [4], MR mounts [5], clutches, brakes [5,6], recoil system [7-9] etc.

In all these applications, the maximum effect is limited by the saturation magnetization of the dispersed magnetic particles. The performance of MR fluid in applications is judged by three parameters called figure of merits [10]. These are; (i) $F_1 = \tau^2/\eta$, where τ is yield stress and η is the viscosity of MR fluid at zero magnetic field, maximizing this figure of merit, helps in minimizing the device size and electrical power consumption. (ii) $F_2 = \tau^2/\eta\rho$, here ρ is the density of MR fluid. This is an important term, when one deals with weight-sensitive applications and (iii) $F_3 = \tau/BH$, here B and H are magnetic flux density and intensity of the fluid. Minimization of this figure of merit will help to reduce current requirement, and it is usually required for high bandwidth applications. Then all these virtues are to be optimized for the MR fluid properties. While the suitability of an MR fluid for a particular use depends on factors such as stability, durability and temperature range, therefore, it becomes very significant to design new MR fluids, which can enhance the MR effect.

In earlier research, much attention has been focused on the use of spherical carbonyl iron particles as a dispersion material because of its high saturation magnetization value. More frequently than not, good MR fluids should be stable against settling and should have high magnetic strength. The major focus on MR fluid research has been to enhance the MR effect, to improve stability against sedimentation and re-dispensability of MR fluids [10-19]. In summation, many efforts have been reported by adding nanoparticles and viscoelastic media to improve stability and re-dispersion. According to recent research, MR fluid based on micro- and nano-fibres have shown better

23	Vanaraj Solanki, Pramita Mishra, and Ruchita patel	Vacuum Technology, Fundamentals for beginners		PDPIAS	Nova Science Publisher USA	National	43678	ISBN 978-93-5373-146-5	KRADLE	Educreation Publishing
24	Dweipayan Goswami, Janki N Thakker and Pinakin Dhandhukia	Book Microbial Catalysts	Urease producing microbes to aid Bio-calcification: An Interdiciplinary	PDPIAS	Nova Science Publisher	International	2019	9781-53616-089-5	PDPIAS	Nova Science Publisher USA
25	Dweipayan Goswami, Pinakin Dhandhukia and Janki N Thakker	Book Microbial Catalysts	Microbial Enzymes: The Types and Roles in the Bio-Control of Fungal Phytopathogens	PDPIAS	STM	International	2019	978-1-53616-0888-8	PDPIAS	Nova Science Publisher
26	Sheeba Menon Janki N Thakker	Research and Reviews: A journal of Biotechnology	Allelopathic Effect of Amaranthus Viridis.L Fresh Leaves on Chickpea Seeds Under in Vivo Condition	PDPIAS		National	2019	2231-3826	PDPIAS	STM

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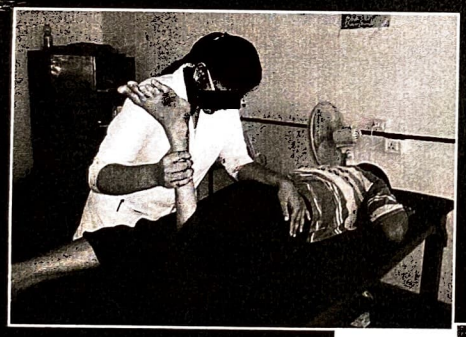

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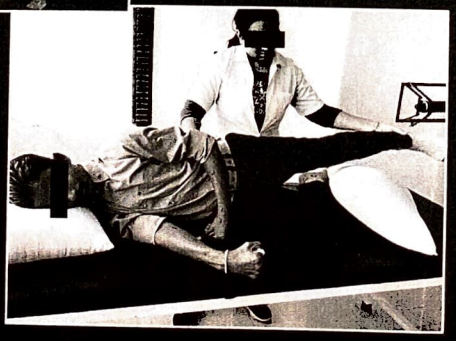

Highlights

- Comprehensive
- Richly illustrated
- Case scenarios
- Easy to remember boxes
- Clinical pearls
- Review questions

JAYPEE

40 CHAPTER

Diabetes Mellitus

Dhruv Dave

LEARNING OBJECTIVES

After reading this chapter, the readers should be able to:

- Explain the pathophysiology, signs, and symptoms of diabetes mellitus
- Understand the diagnosis
- Learn the treatment and complications of diabetes mellitus
- State various guidelines for framing exercise planning and prescription
- Plan and execute various forms of therapeutic modalities for diabetes mellitus.

CHAPTER OUTLINE

INTRODUCTION

Diabetes mellitus is a group of metabolic diseases in which primarily hyperglycemia occurs due to defects in insulin secretion, insulin action, or both. Chronic hyperglycemia in diabetes is associated with long-term damage, dysfunction, and failure of vital organs, especially eyes, kidneys, nerves, heart, and blood vessels. The global burden of this disease is magnifying day by day, and it is one of the four major types of noncommunicable diseases (cardiovascular disease, diabetes, cancer, and chronic respiratory diseases). If not managed, it can lead to some serious complications by damaging the major organs of the body. Early detection and management along with prevention is the key to reduce its impact.

Box 40.1 shows a brief history of origin of diabetes mellitus.

ETIOLOGY OF DIABETES MELLITUS

Type 1 diabetes is caused by autoimmune destruction of the β cells of the pancreas. This process occurs in genetically susceptible people and is (presumably) triggered by an environmental factor. When the majority (approximately

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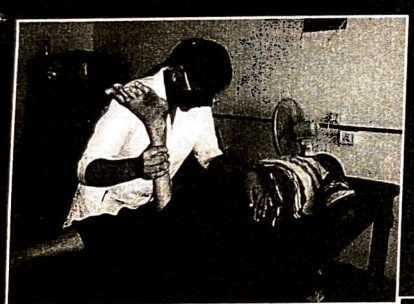

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Srishti S Sharma
Priyasingh B Rangey

Highlights

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JAYPEE

26 CHAPTER

Stroke

Prakash V

LEARNING OBJECTIVES

After reading this chapter, the readers should be able to:

- Define the stroke and describe the risk factors of stroke
- Understand the types of stroke and pathophysiology of stroke and stroke syndromes
- Gain knowledge on how one can prevent stroke and diagnose stroke
- Understand the medical management of stroke
- Understand the mechanisms of recovery, including neuroplasticity, that drive stroke recovery, as well as the impact of physiotherapy interventions on these underlying mechanisms
- Identify key principles of treatment in stroke rehabilitation
- Design and deliver effective physiotherapy treatment strategies for improving patient-preferred outcomes following stroke

CHAPTER OUTLINE

INTRODUCTION

Definition

The World Health Organization defined stroke as: "rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin." This definition excludes transient ischemic attack (TIA), which is defined to last less than 24 hours, and patients with stroke symptoms caused by subdural hemorrhage, tumors, poisoning, or trauma. However, the classic definition has been under criticism due to its primary focus on clinical symptom and its duration.

Recently, the Stroke Council of the American Heart Association (AHA)/American Stroke Association published an updated definition of stroke for the 21st century and recommended that term "stroke" should be broadly used to include all of the following:

- Central nervous system (CNS) infarction
- Ischemic stroke
- Silent CNS infarction
- Stroke caused by intracerebral hemorrhage
- Stroke caused by subarachnoid hemorrhage
- Stroke caused by cerebral venous thrombosis
- Stroke, not otherwise specified.

The updated definition of stroke incorporates clinical and tissue criteria. Definition of each type of stroke is illustrated in **Table 26.1**.