

IoT based Intelligent Bus Transportation System (IoT-ITBS)

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ABSTRACT: The Internet of Things (IoT) is a platform that allows devices to grow smarter, and communication to become more informed on a daily basis. IOT is still growing and reached in every field and connected with our day to day life. Many models and design is used or given by the researchers to make easy or effective models to benefits the society. IoT has many applications, but transportation is one of the most crucial applications. It plays a very important role in all types of transportations like air-transportation, water-transportation, and land-transportation etc. All the components of these transportation fields are made by the smart devices and connected through networks to transmit data from one place to another. In transportation, IoT devices are used for including ticketing, security, surveillance, and telematics systems to provide efficient and socure transportation in urban areas. As the number of vehicles on the road rises, the urban transportation system becomes more complicated every day. That's why we need to integrate IoT in transportation to get more transportation benefits. IoT in transportation is not only to travel from one place to another, but it also makes travelling more convenient for people. The main issue that people are facing now-a-days is in road-transportation that they are unable to get public transport on time due to several unwanted reasons. In early days, we don't have many facilities but now we have everything with us by just one click. We can resolve many day to day travelling problems and also make it safer and secure. IoT based transportation system has many advantages like it can reduce the cost by reducing the fuel consumption and pollution which in turns increase profits to transport companies and also help passengers to make their life easier and faster. IoT enables travellers to maintain constant connectivity with all modes of transportation. To prevent lane departure and to continuously monitor objects on all sides, sensors can be installed inside or outside of a vehicle. Now, the passenger can easily check the availability of seats, timing and the exact location of vehicle. This paper was developed by the survey on the current time issues in public transport and utilization the IOT to make a good model for public transport. The paper is presenting the architecture to resolve the problem in current transport model (Intelligent Bus Transportation System-IBTS) and discussed about the benefits of new model or architecture which is presented by the IOT. This does not include travelling but it also deal with traffic conjunction, cameras and send an alert message to traffic control room as well as other vehicles so that they can divert their route. This architecture will be helpful to solve real-life problems because it focused on passengers and make powerful intelligent buses subsystem to make the easy life for them.

Non-Perturbative Approximate Solution of Fractional Riccati Type Equation

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Abstract. In the present paper a non-perturbative approximate analytic solution is derived for the fractional Riccati type equation by using Adomian Decomposition Method (ADM). The decomposition series solution is very rapidly convergent, and only a few terms of the series solution leads to a very good approximation with the actual solution of the problem. The present method performs extremely well in terms of accuracy, efficiency and simplicity.

Keywords: ADM, Power Series Method, Riccati equation.

INTRODUCTION

Recently a great deal of interest has been focused on Adomian's Decomposition Method (ADM) and its applications to wide class of physical problems containing fractional derivatives [5,6,11,12,13]. The decomposition method employed here is adequately discussed in the published literature [3,4,16], but it still deserves emphasis to point out the very significant advantages over other methods. The said method can also be an effective procedure for the solution of fractional Riccati type equation.

The fractional differential equations have been used to model problems in Physics [2,9], Fluid Mechanics [17,18] and wave propagation phenomena [7,8]. In mathematics, a Riccati equation is any first order ordinary differential equation that is quadratic in the unknown function. In other words, it is an equation of the form

$$\frac{dy(x)}{dx} = q_0(x) + q_1(x)y(x) + q_2(x)y^2(x),$$

where $q_0(x) \neq 0$ and $q_2(x) \neq 0$.

If $q_0(x) = 0$, the equation reduces to a Bernoulli equation, while if $q_2(x) = 0$, the equation becomes a first order linear ordinary differential equation. The equation is named after Count Jacopo Francesco Riccati (1676-1754). More generally, the term "Riccati equation" is used to refer to matrix equations with an analogous quadratic term, which occur in both continuous-time and discrete-time linear quadratic-Gaussian control. The steady-state (non dynamic) version of these is referred to as the algebraic Riccati equation.

The Riccati type equation is one of the basic equations in theoretical physics and has been the focus of many studies. In the present paper we implemented the ADM to the fractional Riccati type equation which is given by

$$\frac{d^{1/2}y(x)}{dx^{1/2}} = -xy(x) + xy^2(x), \quad (1)$$

where $\frac{d^{1/2}}{dx^{1/2}}$ is the fractional differential operator of order $\frac{1}{2}$ [1,19]. In these schemes the solution constructed in power series with easily computable components.

Prabhat
80/0028377

Development of Virtual Assistant Chatbot (Agroxpert) for Agricultural Yield & Crop Prediction using Data Mining & Machine Learning Techniques

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Abstract:

Approx. 50% of the Indian population depends on agriculture as a livelihood. So agriculture is the primary Sector for livelihood still, the share of agriculture in GDP is only 20% in 2020-21. Farmers in undeveloped countries have led to technological backwardness and a low rate of income to carry out modern agricultural activities. Agricultural expert advice is essential for the growth of agricultural businesses. In this Research paper, agriculture knowledge is used in the following two ways: One way is to provide livestock information and farming advice to increase their Agricultural Yield & Crop Production. Second way is to provide education, advice & direct interaction with the government by keeping them updated with the financial schemes available to them and the daily market prices of farm products.

Agriculture occupies an important position in the undeveloped countries economy. Farmers in undeveloped countries today are facing the problem of low income due to the lack of information about government schemes, better quality seeds, fertilizers and farming equipment etc. Some smallholders and marginalized farmers have low awareness as most of them live in remote village areas and don't have any intelligent access to information about soil properties, seeds, recently used tools, fertilizers, etc. The document proposes an intelligent, portable system that uses natural language processing methods to help farmers use different farming methods, and further help them to answer their queries and solve their basic and intermediate level doubts using Virtual Assistant Chatbot (Agro Farmer / Agroxpert) which will save their time. To meet all the requirements of farmers, a Chatbot (Agro Farmer / Agroxpert) is proposed using Natural Language Processing (RNN) technology. The system will act as an interactive virtual assistant for farmers, answering all queries related to agriculture. The system will act as an interactive virtual assistant for farmers, answering all queries related to agriculture. This paper will go through the implementation of the chatbot (Agro Farmer / Agroxpert) using the Chatterbox libraries and Django framework.

As agriculture also seems to be a crucial part in food security as well as economic development of a country, selecting crops for cultivation is a most important aspect in an agricultural planning. It relies on variety of attributes, features which includes weather, Climate conditions, soil property, different animals and government policies. The suggested system helps the farmers to select suitable crop based on seasons, regions, kinds of farming and sowing conditions. It will also in-turn facilitate the farmers by improving the net profit to them. By considering different Agriculture Datasets with respect to many parameters such as rainfall, temperature, slope, humidity and soil moisture, outlook of agriculture as

Analysis of FT-IR and FT-Raman Spectra, Thermodynamic Functions and Non-linear Optical Properties of 2,6-Dimethyl-4-nitrophenol

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ABSTRACT

The FT-IR and FT-Raman spectra of 2,6-Dimethyl-4-nitrophenol has been recorded in the range of 4000-100cm⁻¹. The fundamental mode of vibrational frequencies of compounds 26DM4NP is assigned. All the geometrical parameters have been calculated by using HF method with 6-311++G(d,p) basis set. Optimized geometries of the molecules have been interpreted and compared with the reported experimental values for substituted phenols. The harmonic and anharmonic vibrational wave numbers, IR intensities, Raman activities, reduced mass and force constants are calculated at the same theory level used in geometry optimization by the scaled vibrational frequencies at HF /6-311++G(d,p) seems to coincide with the experimentally observed values with good agreement. The difference between observed and scaled wave number values of most of the fundamentals is very small in HF. The molecular interactions between the substitutions [OH, CH₃ and NO₂] are also analyzed. The thermodynamic parameters have also been calculated at the same theory level.

Keywords FT-IR and FT-Raman spectra, 26DM4NP, Thermodynamic Function, HF, NLO properties.

1. INTRODUCTION

Phenols are organic compounds that contain a hydroxyl group (OH) bound directly to a carbon atom in the benzene ring. Unlike normal alcohols, phenols are acidic because of the influence of the aromatic ring. Phenol derivatives are interesting molecules for theoretical studies due to their relatively small size and similarity to biological species. Phenols are widely used as synthetic organic materials and also as antioxidants in living organisms. Phenoxy radicals represent important intermediates in many biological and industrial applications.

Phenols are made by fusing a sulphonic acid with sodium hydroxide to form the sodium salt of the phenol. The free phenol is liberated by adding sulphuric acid. It is used as anti-bacterial and anti-septic and also for the treatment of surgical instrument and bandaging materials. In recent years, phenol and substituted phenol have been the frequent subjects of experimental and theoretical work because of their significance in industry and environment.

The vibrational spectrum of phenol was extensively studied and analyzed. Various spectroscopic studies of chloro and methyl phenols have been reported in the literature (1-3). Recently, Sing and Rai have studied the infrared and the electronic absorption spectra of 4-chloro-3-methyl and 6-chloro-3-methyl phenols. A complete vibrational assignment of phenol and phenol-OD has been given (4-6). The vibrational spectra of p-cresol and its deuterated derivatives have been studied by Jakobsen(7.), who gave detailed interpretations of the vibrational bands. The assignment of the vibrational frequencies for substituted phenols becomes complicated problem because of the superposition of perhaps several vibrations due to fundamentals and due to substituent's. However, a comparison of the

Comparisons of Machine Learning Algorithms on Basis of Accuracy

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Abstract

Machine learning is an element of data science and a subset of artificial intelligence, which is generally well-defined as an ability to imitate the way that humans acquire, progressively refining its accuracy. In machine learning by the use of statistical analysis, algorithms are designed to do predictions. There are various types of machine learning algorithms. The aim of this work is to compare the performance of ML classifier. These ML classifiers are Logistic Regression, Decision Tree, Naive Bayes, k-Nearest Neighbors, Support Vector Machine and Random Forests classifiers on two datasets on the basis of its accuracy, precision and f measure. The experimental results reveal that it is found that the Random Forests performance is better than the other classifiers. In this paper comparison will be done among algorithms will help researchers to choose the right algorithm.

Key Words: Machine learning, algorithms, Linear Regression, Decision Tree, SVM, KNN, Neural Network, Neural Network, Logistic Regression, Naive Bayes.

Introduction

Machine learning is the science that allows computer to learn and behave like human by feeding those data and information without being explicitly programmed. Machine Learning (ML) plays an important role in extracting accurate information from large amounts of data. Machine Learning is more effective at exploring knowledge, validating data and its behavior. When the data is available, it is divided into training and test dataset and trained to explore where it is in the future[1]. Machine learning can be trained by feeding machines large amounts of data, allowing them to explore the data, build patterns, and automatically predict the desired output. The performance of machine learning algorithms depends on the amount of data, and the use of machine learning can be determined by a cost function, we can save time and money. Machine learning combines computing and statistics to create predictive models. ML steps are shown in Fig 1.

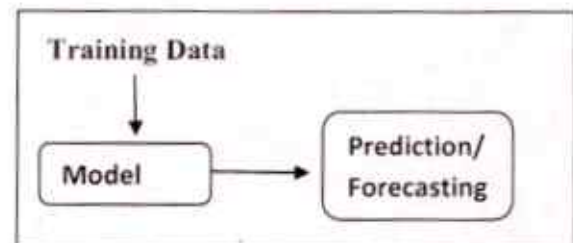


Figure 1

In this article, we discuss the performance comparison of ML algorithms on two different data sets. It then compares the performance of ML classifiers on the two datasets in terms of precision, accuracy, recall, and F-measure, and details techniques that can effectively analyze the data. The results describe valid results for evaluating historical data, carefully deciding which classifier to apply to obtain future predictions and decisions.

II. Machine Learning Classifier

Connect between Artificial Intelligence and Emotional Intelligence at workplace

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Abstract

Employees that are emotionally intelligent have greater emotional self-awareness, greater emotional expression, greater creativity, greater openness and greater connections of trust and loyalty both within and between organizations. This information paves the way of present research. In the present research article authors identify the need of Emotional Intelligence in an organization and suggest how it can raise workers' productivity and the field's performance. In addition, they discover how Artificial intelligence data and automation helps in doing work diligently and for long hours, however the interaction between employees, employers, machines, improve production and interpersonal relations. According to research, it has become clear through experience that a healthy connect between artificial intelligence and emotional intelligence is necessary to progress and be successful in corporate world.

Key words: Emotional Intelligence, Artificial Intelligence, Emotional Quotient, Automation

INTRODUCTION

With the origin of Emotional Intelligence (EQ) in our life it plays vital role in, whether or not its personal life or skilled one should maintain the work –life. Balance between these 2 lives which is now-days one thing that is extremely necessary like meeting both ends. Doubtless it's a difficult state of affairs, whether or not it's our relation with our family, colleagues or bosses all area unit wise essential, one should set of these and move forward with maintaining emotional Balance this can be the necessity of the hour. Analyst believe Emotional Intelligence (EQ) is a inborn characteristics, or others says that you just train yourself to find out Emotional Intelligence and strengthen it in day by day to boost your social relations though range of testing instruments has been developed to check it content and approach varies.

"Emotional Intelligence is that the ability to sense, perceive worth and effectively apply the ability of emotions as a supply of human energy, data, trust, creativeness and influence" [2].

BODY LANGUAGE AND VISUAL COMMUNICATION: KINESICS IN BUSINESS NEGOTIATIONS

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ABSTRACT

Human beings communicate through a different of channels of communication to express their mental and emotional perspectives. Language is not the particular mode by which humans can exchange views, ideas and information. In early period when languages were not invented, humans used to exchange their views via different mediums. Early humans could express thoughts and feelings by means of speech or by signs or gestures. The origin of language and its relationship with human evolution is direct example, that sensory expressions plays wider role over external environment understanding and responses. Our first communication is visual and then we add some evaluated and calculative verbal phrases to deliver our speech to make other person decode the message as we want to deliver and allow him to decode, not what we actually feel. However having understanding of visual expressions before hang on to the verbal thoughts is phenomenon analysis, which makes the person critical thinker. In conversation, we express our ideas and feelings not only with words but also through facial expressions, voice tones, pauses and gestures. These non-verbal expressions are kinesics. It is wordless expression which is just as important as our verbal language, is also a part of our daily life. In business negotiations, body language plays a significant role in the communicating with external environment. It is necessary to master this skill by skimming to scanning to demonstrate absolutely the articulation of gesticulation. This article mainly discusses the art of decoding body language in negotiation. Article states the functions and importance of your Kinesics in business negotiations, then explores how to use and understand body language in negotiations by proactive observation and monitoring. Different people have different behaviors of delivering nonverbal communication. It shows the capability of observer to know the importance of decoding the specific signals that go together with a language, for being master in professional life. It finally emphasizes the necessity and importance of learning body language in non-verbal communication and business negotiations.

Keywords: Body language, Negotiation, observation, decoding, skimming and scanning.



A review on the recent applications of particle swarm optimization & genetic algorithm during antenna design

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Abstract

In recent years, the utilization of optimization techniques in versatile domains such as manufacturing, design and engineering sectors is increased due to their potential and applicability to identify optimal values of process parameters. An effective design of a fully functional antenna is needed for rise in wireless communication sector. Thereby, the design, material selection is also an important feature in antenna design. The design of high-directivity antennas is a challenging task for researchers. Therefore, various researchers employed different optimization techniques for the efficient design of antennas. In the present work, authors reviewed the implementation of different optimization approaches in antenna design for future direction of research work.

Introduction

In recent years, the interest of researchers is increased towards Antenna design optimization. This is due to that conventional antenna design methodologies are exhaustive and their uncertainty towards the expected outcomes especially topology and performance. Moreover, the complexity of contemporary antennas is also a vital issue. However, the application of optimization techniques in antenna design has various key issues



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Shop Floor Productivity Enhancement Using a Modified Lean Manufacturing Approach

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Conference paper | [First Online: 24 July 2021](#)

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Abstract

Constantly improvement in shop floor management has become a necessity in today's worldwide industries. Various approaches are used to fulfill this requirement, mainly including lean manufacturing, kaizen, total quality management, six sigma, and lean six sigma approaches. These approaches are used to improve shop floor management and optimization of resources in the present industrial environment. In the present article, the authors developed a modified lean manufacturing approach to enhance the shop floor productivity through

IoT Alert Observation of Prohibited Deforestation Regions with Drone Surveillance

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Abstract:

In terms of the environment, deforestation causes biodiversity loss as well as climatic change, which harms natural ecosystems. It causes conflicts over land and other resources, which mainly damage communities globally. Due to degradation in forest exploitation, it becomes vulnerable in terms of land diversity, which tends to release excessive carbon dioxide and also cause greenhouse gases. Mainly, forest loss and degradation cause a total of 10% gross damage, which leads to global warming. This technique allows management or an authorized individual to identify the location of the trafficking via GPS as well as the manner in which it is done, including such tree-cutting, fires, or the intense heat in the forest as it is indeed difficult to stop illegal trafficking of trees. Bots in green establishment of effective forest management and surveillance can benefit greatly from IoT. Collecting and using basic forestry data presents various challenges for emerging economies. To respond effectively to areas and make better judgments, person who is in charge of maintaining forests and ecological issues can benefit from data about daily forestry, burned zone evaluation, and forest infraction monitoring. When individuals are unable to provide assistance, the proposed system has a low-tech, IOT-based structure to detect illegal tree trafficking. IoT technology with sensors, which is effective and affordable, monitors human behavior, fires inside the forest, and illicit deforestation.

Keywords: IoT, Drones, Remote Sensing, GPS, Deforestation, Ecological Issues

Improvement in shop floor management using ANN coupled with VSM: A case study

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Abstract

In the present article, the authors have employed the Value Stream Mapping (VSM) technique for the existing shop floor process in an earthmoving equipment manufacturing unit. Thereafter, an Artificial Neural Network (ANN)-based information processing technique has been used for generating a prediction model of shop floor management. For developing the ANN-based prediction model, the production time involved in different processes has been collected for 31 working days. This collected data has been used for training and testing the ANN model. Thereafter, to validate the developed ANN model, more 7 days data has been collected and compared with the predicted values of model for the same input attributes. From the results, it has been found that the performance of the developed model is highly adequate for the prediction purpose with the MSE and MAE values for training data and testing data as 0.0008105545 and 0.0000008979 and 0.01012315 and 0.0001658978, respectively. Based on the acquired results it is evident that the proposed methodology may be significant in predicting the production time of the anticipated shop floor.

Keywords

Shop floor, value stream mapping, artificial neural network, Earthmoving machinery, modeling

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Introduction

In today's global world, manufacturing industries are putting in effort to give strong competition to their competitors due to various factors like rapid market changes, small product life cycles, globalization, and high productivity. These factors possess a vital impact on the production process cycle. Moreover, improved product quality with a short production time is essential due to aggressive industrial willingness. This complex scenario has led to a considerable interest of researchers in the implementation of different process improvement techniques in the design, planning, production, and control of manufacturing systems as new research trends.¹

The construction equipment manufacturing sector is highly influenced by this demand of the global market. This sector can be classified into four different types viz. earthmoving, concrete, and material handling equipment, and road construction equipment.² However, the division of earthmoving equipment attains the major portion in this sector and acquires approximately 60% in the whole construction equipment category.³ The earthmoving equipment segment largely contains excavators, loaders, backhoe loaders, and tractors. Out of all, the skid steer loader is one of the most commonly used to dig foundations and landscape areas. The Indian earthmoving equipment manufacturing industries are assured of tremendous growth shortly due to the growth of India's overall manufacturing and infrastructure sector. Thus, to enhance this chance, the focus of Indian earthmoving equipment manufacturing

industries is turned towards improvement in the production capabilities to compete globally through the timely availability of the finished product. Thereby, in the present research work, the case study is focused on the earthmoving equipment manufacturing industry.^{4,5}

Various techniques like Six-sigma, Kanban, Kaizen, and Value Stream Mapping (VSM) of the lean approach are used by researchers timely to attain improvement in the existing manufacturing system.^{6,7} VSM proved its superiority in comparison of other lean techniques by improving operational performance on the shop floor within limited constraints. VSM is based on the concept to achieve manufacturing excellence by reducing wastes or minimize production time. It is used to analyze the present and future state for the sequence of events using the mapping of material and information flow. VSM considers the series of events from the beginning of the process to final delivery to the customer.⁸ It is a visual tool that indicates all the process

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Optimization of heat affected zone in laser cutting of Kevlar-29 fiber composite using hybrid response surface based grey wolf optimization (RSGWO) algorithm

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Akanksha Prajapati¹ , Gavendra Norkey² and Girish D Gautam³ 

Abstract

The large strength-to-weight rate and superior mechanical qualities, Kevlar fiber reinforced polymers (KFRP) are commonly utilized in the aerospace, vehicle, and energy sectors. The fine machining of KFRPs in these sectors was required for specific applications. Because of low matrix cracking, burr development, negligible tool wear, and fiber delamination, laser beam cutting (LBC) is a promising alternative to traditional cutting processes in KFRP cutting. During pulsed laser cutting of neodymium-doped yttrium aluminum garnet of the K-29 (Kevlar composite laminate) for the 1.25 mm thickness, the heat affected zone (HAZ) was determined experimentally at various settings of the lamp current, pulse frequency, and cutting speed. A second-order regression model for HAZ was demonstrated by using experimentally obtained data. A novel response surface-based grey wolf optimization (RSGWO) algorithm has also been proposed and used to discover optimal levels of process parameter conditions for minimizing HAZ. The RSGWO technique has proposed ideal values for the specified parameters at low pulse frequency (20 Hz) and lamp current (160 A), as well as greater air pressure (10 kg/cm²) with cutting speed (200 mm/min). At optimal cutting parameter values, a 14.92% improvement in HAZ was observed. Furthermore, parametric effects have been studied, and it has been discovered that compressed air pressure is the valuable parameter for HAZ for laser-cut KFRP composite, while lamp current (I) is the least important.

Keywords

neodymium-doped yttrium aluminum garnet laser, Kevlar-29 fiber, HAZ, optimization, response surface methodology, grey wolf optimization

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Introduction

In current years, composites KFRP (Kevlar fiber reinforced polymer) have been the main focus of researchers for their tremendous features of thermo-mechanical and antiballistic properties. Man-made synthetic FRP (fiber reinforced polymer) composites have been replaced by KFRP composites due to their better thermal and chemical resistance properties.¹ The industries like sports, construction, automobile, marine, and defense have a wide range of uses of KFRP composites. The corrosion resistance of these composites is more in comparison to other metals. These composites make their footprint in the aerospace and automobile industries due to possessing properties like restrained anisotropy and preferable specific strength.² The para-phenylenediamine (PPU) and tera-phthaloyl chloride (TCI) are used to drive the Kevlar composite in inclusion also these composite comes under the polyamide group. In comparison to steel, the strength of Kevlar fiber is five times more and with the renovation of steel, the Kevlar composite was used in a racing car for the first time.³ In the present

scenario, various types of Kevlar fiber are feasible in the industries like K-49, K-129, K-29, K-100, etc. Due to huge strength (520,000 psi/3600 Mpa) and small density of K-29 fibers, these fibers have extensive industrial utilization.

The boost utilization of KFRP composites is going on in various industries like electronics, automobile and aerospace. The anisotropy and essential heterogeneity of FRP composites have been noted, and traditional machining procedures are not suitable for machining these composites. Various machining defects like thermal degradation, delamination, matrix

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Adaptive grey model (AGM) approach for judgemental forecasting in short-term manufacturing demand


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

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Abstract

The covid-19 pandemic has created problems in every manufacturing sector and has posed considerable challenges to pharmaceutical, healthcare, and sanitation companies. The challenges faced are particularly daunting for pharmaceutical companies producing vaccines with ever-growing demand and shorter and shorter deadlines to fulfill them. Further, due to the vaccine's novelty and unprecedented demand, there is a lack of any available data on which traditional forecasting methods can be used. In this paper, we attempt to propose a solution by utilizing the Grey Systems Theory, particularly the AGM (1, 1) model, which has been used to significant effect for problems involving uncertain / lack of data to forecast the demand for vaccines. The experimental results obtained showed that our proposed model successfully generated accurate forecasts with a small dataset and minimal error. Additionally, judgmental forecasting has been used to qualitatively assess the future scope of vaccine manufacturing as well as the use cases of the model. We can thus effectively say proposed AGM (1,1) model is a lucid method to forecast the demand for vaccines.



Future Traffic Management Based On AI and IoT To Enhance Traffic Control and Monitoring

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Abstract

In the recent digital era, various new technologies just like AI, IoT, AR and VR, Data science and Blockchain will have a great impact on the human's life. Not only these technologies affecting the human's life independently but also the fusions of these technologies have a great impact on the daily life of humans. AI and IoT, AI and Blockchain and Blockchain with IoT have a great impact on various domains. Recently the fusion of AI and IoT called as AIoT comes into existence. This technology is basically used for finding the crowded area or the congested area. With the help of recently developed and upcoming technologies, a new and better transport system comes into existence. Lots of challenges and huddles for the better traffic management in future transport system. This will help in betterment of future transport system to avoid the accident, congestion and unwanted traffic jams.

This paper proposed a model of transport system using the fusion of IoT and AI for better traffic management to avoid the accident and congestion in the transport system. This system uses the data analysis using machine learning to find the accident prone area, crowded area and monitoring and controlling the traffic using IoT sensors in the proposed transport system for smart cities.

IndexTerms – Traffic management, Controlling, Monitoring, AI, IoT, AIoT, Smart Cities.

I. INTRODUCTION

In the past, technologies have helped organizations' tackle problems in a variety of industries, including retail, finance, insurance, healthcare, and even sports. Some of these ideas have altered how companies are conducted by lowering operating costs, increasing efficiency, and enhancing efficiency. One of the newest industries where cutting-edge technology has been successfully used is transportation, which is beset by problems with traffic congestion, unanticipated delays, and routing challenges that cause firms to lose money.

The transportation sector has significantly aided in the transportation of people and goods between different geographical areas. In a supply chain management system where commodities are moved from one location to another, it is crucial. The logistics chain depends on the movement of commodities to the convenient location at a convenient time. For organizations and governments to be able to fully profit from commercial investments, they have invested heavily in technology such as artificial intelligence, machine learning, and the internet of things.

Artificial Intelligence

The study of artificial intelligence (AI) examines how our brains function and how they attempt to solve problems. The study's eventual product is intelligent software systems. AI seeks to enhance computer abilities that are connected to human understanding, such as problem-solving, learning, and reasoning.

Nowadays, AI is employed in practically every industry, offering businesses that adopt it widely a technological advantage. In comparison to previous analytics methods, AI has the ability to add 50% more incremental value to the banking industry and 600 billion dollars of value to the retail sector. The potential income increase in logistics and transportation is 89 percent higher.

AI is a technology that imbues machines with human intellect, to put it simply. Machines with artificial intelligence can mimic humans, automate laborious tasks, and learn on the fly just as humans do. As a result of automation, AI takes on repetitive and time-consuming tasks. A major advantage of AI-based systems is that they mimic human intelligence, and in the end, these computers may be able to think critically and independently make decisions based on their own input. Businesses in the transportation sector are investing heavily in order to increase revenue production and stay ahead of their rivals as a result of realizing the unique potential of AI. Studies predict that by 2023, the global market for AI in transportation would be worth 3.5 billion dollars. Some of the application of AI in transport industries is self-driving cars, traffic management, delay prediction and drone taxis.

Cyber Security: A New Technological Challenge

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Abstract:

At present, many profitable, marketable, artistic, social, and governmental relations, as well as international relations, in all cases, including individuals, non-governmental organizations, and public and private institutions, have been created online. Recently, many private companies and government agencies around the world are facing the threat of cyber-attacks and the dangers of wireless communication technology. The temporary world relies heavily on electronic technology, and monitoring this data from cyber attacks is a major problem. The purpose of the cyber-attack is to damage companies financially. In some cases, cyber-attacks may have military or political objectives. These damages include PC infections, datacuts, data distribution services(DDS), and other attack vectors. To date, colorful organizations use color effects to help the damage caused by cyber-attacks. Cyber security follows real-time data on back-end IT data. The conclusion of this study is to fully evaluate and review the most common advances made in the field of online safety and to investigate the challenges, sins, and strengths of the proposed styles. Different types of new customer attacks are considered in detail. Common safety clothes are embedded in the history and styles of the first generation of cyber security. Additionally, emerging trends and the latest developments in online safety, with security pitfalls and challenges being introduced. It is expected that a comprehensive review of research presented by IT and online security testers will help.

Key-words: Cyber attacks, Cybercrime, Cyber security, Wireless Communication, Data Distribution Services (DDS), PC infections, and Internet attack

Introduction:

We live in the age of Information Technology where information sharing is becoming increasingly important. As we all know, emerging technologies require very fast communication and secure data sharing. It is very important to protect information about users, employees, customers, and records when shared in bulk form. SO, here the word CYBER-SECURITY is introduced. Today the internet is a rapidly growing infrastructure in everyday life. In today's technological world many of the latest technologies are changing the face of humanity. But thanks to these emerging technologies, we are unable to protect our

Fwd to R&D mchgmt. / committee

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**2, 6-Bis (Benzimidazol-2-Yl) Pyrazine, Its N-Methylated Derivative
Reactions with Some Acids and Cobalt (II) Salts**

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Abstract: The NMR, IR and Electronic spectra studies on biologically active complexes of Co (II) have been reported. The bands observed and discussed assuming the molecule under CS point group symmetry. The electronic study in nujol phase has been calculated. The IR spectral studies of this compound have been discussed

Keywords: NMR, IR and Electronic Spectra studies

INTRODUCTION:

Benzimidazole derivatives are receiving considerable attention as ligands since various substituents could significantly modify the physical and chemical properties of their metal complexes relative to those of the complexes with the parent ligand. Steric and electronic factors would cause large variations in the σ -donor as well as π -donor acceptor abilities of the N-atoms in such systems. It is suggested that the five and six membered N-heterocycles both being π -electron deficient differ in their π -acceptor capacity. While the latter are excellent π -acceptors the former are much poorer π -acceptors but better π -donors. This perhaps is responsible for the interesting ligating behaviour of the planar multidentate N-heterocycles with coupled five and six-membered rings.

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Dr. Ishwar Singh
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Approximation Knowledge-Based Recurrent Neural Network for Estimating N-Terminal Reliability

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Abstract— The main problem dispersed with in this paper is to find a novel method for the improvement in the reliability analysis of Computer Network. Reliability prediction are estimated during the life cycle of a computer network with the aim of estimating failure. In designing a variable size network, the serviceability, availability and reliability of the any network is a primary consideration. The reliability calculation in varying size network is a problem of NP-hard; it requires more calculation and effort with the amplifying no of nodes and links. Many different approaches have been taken for reliability and probability calculation for triumphant communication between any pair of computers. The paper presents a method for identifying n-terminal network reliability based on RNN technique. The method derived in this paper preceding inputs which increases the speed of computation. The approach works efficiently and overcome the difficulties of the previous approaches defined with neural network model and other reliability estimation techniques. It is proposed that the RNN model be used to replace the most time-consuming component of the system reliability evaluation approach. A variable-length sequence input can be handled by RNN. The main goal of this paper is to predict asperity of reliability which is highly correlated with performance of network in any unfavorable conditions.

Keywords- NP-Hard, All-terminal network reliability, estimation, neural network, RNN, spatio-temporal.

I. INTRODUCTION

The reliability of any communication path between any specified pair of the node in a computer communication network is the primary design consideration. Generally, it is fully dependent on the topology of a network and other communication facilities [1]. The tailed treatment of successful communication is fully dependent on various factors. Reliability is the communication between the nodes of the network [2]. Practically it is difficult to exact reliability calculation in growing variable sized, highly increasing networks from very small to large network size.

The reliability optimization problem concerned with the ability to identify a design that meets less cost and more reliability. The maximizing reliability problem in system networks has taken huge rise due to the designing of complex systems. The component of a network is n object of a network. The problem of finding and maximizing reliability in a network of is declared as the communication of each node of a network. Mostly, the network reliability calculation is of two types: all-terminal and source-sink reliability [11]. There are many methods and techniques used for network reliability

calculation. Most of these methods are simulation or analytical based, which requires significant computational effort. These methods are simple and very effective for the network of smaller size. For highly increasing and variable sized growing networks, these techniques are not suitable, because, most of these techniques require simulations to be repeated numerous times which costs significant computational effort [3].

Approaches designed earlier have few major drawbacks exact estimation of reliability, probability of successful communication and long vector length and it cannot work efficiently if the network is of varying size. Failure predictions must be sound in nature that they represent all the uncertainties involved. The novelty in this paper is the usage of RNN with LSTM version for estimation of network reliability. The paper provides an approach using Long Short-Term Memory Networks. The LSTM solves the problem by merging the network parameters with the hidden node. RNN outperforms LSTM because it activates states in response to network events.

The successful communication probability between any two specified pair of vertices is defined as.

Particle Swarm based Optimization of Hole Characteristics during Laser Drilling of BFRP

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Abstract

There are various types of materials used in modern industries having excellent mechanical characteristics. Basalt composite having excellent mechanical properties and are widely used in defence and Automobile sector. The precision machining is the important factor has been considered of this basalt composite. In the present work, Reducing Hole taper along with Heat affected zone for better hole circularity has been considered during Laser Beam Drilling (LBD) of Basalt fiber reinforced polymer (BFRP). The prediction of result has been done by mathematical modelling designed by RSM based on Box-Behnken design and Particle Swarm Optimization Technique (PSO) has been employed successfully to identify the optimal input drilling parameter. The obtained result has been validated by performing more experiments.

Keywords: Hole Circularity; PSO; Hole taper (HT); Heat affected zone (HAZ)

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1. Introduction

Nowadays, generally composites are applicable due to light weight, cheap and better mechanical properties. The reinforcement material made by fabrication of composite with polymer-based matrix is usually not so much costly than the other material [1]. Basalt is found from natural volcanic rock. It is too much environmentally friendly and non-hazardous, non-toxic, non-combustible [2-7]. There are lots of application found in last few years [8-11]. Sim et al. [3] have found that the basalt

fiber is best alternative to use in Structures with concrete. It is also used in making of circuit boards, cables and ducts. Fire protection instruments can be made with the help of these materials due to its thermal insulating properties [12]. Fiore et al. [13] suggested that the mechanical properties have been improved by hybrid laminates of GFRP and basalt laminates. Basalt fibers can be considered in marine applications for manufacturing the boat in spite of glass fiber. Hence, they can be used hybrid of basalt and glass for better composite. This



ARTICLE ACCEPTANCE LETTER

Date: 10/Dec/2022

Dear Author,

Thank you very much for your submission to our journal.

We are pleased to inform you that your paper has been reviewed, and **accepted** for publication in the **Current Issue** of the journal **NeuroQuantology: An Interdisciplinary Journal of Neuroscience and Quantum Physics, ISSN; 1303 5150** based on the Recommendation of the Editorial Board without any major corrections in the content submitted by the researcher. This letter is the official confirmation of acceptance of your research paper.

Title: "Recent Implementations of Optimization Techniques in Machine Learning"

Author's: Anil Kumar, Subham Agrawal, Ashish Kumar, Shweta Chaudhary, Mala Yadav and Dr. Girish Dutt Gautam

Kindly acknowledge the Paper acceptance.

Best wishes,

Editor In-Chief:
Sultan Tarlaci
Prof., M.D., PhD.
Dept of Neurology and Psychology

ARTICLE ACCEPTANCE LETTER

Date: 01/Oct/2022

Dear Author,

Thank you very much for your submission to our journal.

We are pleased to inform you that your paper has been reviewed, and **accepted** for publication in the **Current Issue** of the journal **NeuroQuantology: An Interdisciplinary Journal of Neuroscience and Quantum Physics, ISSN; 1303 5150** based on the Recommendation of the Editorial Board without any major corrections in the content submitted by the researcher. This letter is the official confirmation of acceptance of your research paper.

Title: "Recent Implementations of Machine Learning in Blockchain: A Review"

Author's: Priyanka Chandani, Shweta Mishra, Yaduveer Singh, Sonia Arora and Girish Dutt Gautam

Kindly acknowledge the Paper acceptance.

Best wishes,



Editor In-Chief:
Sultan Tariaci
Prof., M.D., PhD.
Dept of Neurology and Psychology



Fuzzy Logic-Based Multi-Hop Directional Location Routing in Vehicular Ad-hoc Network

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Abstract

A vehicular ad-hoc network (*VANET*) is an autonomous system of mobile vehicles created on-demand where vehicles can send or receive data packets over wireless links. In *VANET*, vehicles have limited communication range R and can communicate directly with neighbor vehicles. Vehicles are equipped with the short communication range dedicated communicative device, global positioning system and other computing devices. Links among vehicles break frequently due to the highly movable nature and limited communication range which turns into data delivery failure. To overcome data delivery failure in multi-hop routing, a novel routing model namely fuzzy logic-based multi-hop directional location routing (*FLMDLR*) in the vehicular ad-hoc networks has been developed. Using the concept of fuzzy logic, *FLMDLR* selects remarkable next-hops which help to establish a stable route from the source S to destination node D . Research work done in this paper has shown fuzzy logic applications are more useful to deliver data packets from node S to D . *FLMDLR* has simulated through network simulator-2 to evaluate performance in term of the link duration, next-hop distance, average number of next-hops, and one hop delay. Through simulated result has shown the proposed model *FLMDLR* perform better as compared to existing directional-location aided routing (*D-LAR*) and location aided routing (*LAR*) protocols.

Keywords *VANET* · *FLMDLR* · Next-hop node · Fuzzy logic · *D-LAR* · *LAR*

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Facile surface modification of Nickel ferrite nanomaterial by different routes: Photoluminescence and photocatalytic activities

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Abstract

Nanocrystalline spinel NiFe_2O_4 was synthesized by a simple combustion method using Oxalyl Dihydrazide (ODH) as fuel. For the comparative study, it was also prepared by sol gel method. Powder X-ray diffraction results indicate that the synthesized samples have single-phase cubic spinel structure with high crystallinity for sol gel synthesized sample. The combustion synthesized NiFe_2O_4 samples contain several pores and voids, whereas the sol gel method consists of irregular shaped thin flakes like structure as revealed by SEM. The photoluminescence spectrum reveals the occupancy of Ni^{2+} ions in both octahedral and tetrahedral sites resulting in mixed spinel structure. Both the samples were successfully tested as catalysts for the degradation of Direct Green (DG) under UV and Sunlight irradiation. The sample prepared by sol gel method shows a very good degradation of 73% (UV light) and 90% (Sunlight) compared to combustion method with high recyclability. This emphasize the importance of preparation methodology for NiFe_2O_4 proving the best performance for sol gel method with high degradation for DG dye under sunlight irradiation.

Next

Keywords

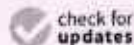
Solution combustion synthesis; Sol gel; Spinel; Degradation

Article

An Agile System to Enhance Productivity through a Modified Value Stream Mapping Approach in Industry 4.0: A Novel Approach

Varun Tripathi ¹, Somnath Chattopadhyaya ², Alok Bhadauria ³, Shubham Sharma ^{4,*}, Changhe Li ⁵, Danil Yurievich Pimenov ⁶, Khaled Giasin ^{7,*}, Sunpreet Singh ^{8,9} and Girish Dutt Gautam ¹⁰

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Abstract: Worldwide, industries are emphasizing the development of an agile system to sustain higher productivity, which can be applied to ensure improvements in all production conditions in industry 4.0. In the present scenario, several methods are used for improvements in production, such as value stream mapping, kaizen, just in time, Kanban, and total productive maintenance, etc.,. The objective of the present research article is to produce an agile system to sustain improvements in productivity through a methodology coupled with value stream mapping in industry 4.0. Value stream mapping is a lean-based method and is used for the maximization of productivity by the elimination of non-value-added activities. The proposed methodology has been validated by productivity enhancements achieved in a case study of the earthmoving machinery manufacturing sector. The study establishes that the proposed methodology would encourage industry personnel during decision-making processes, which would lead to improvements in production in industry 4.0.

Keywords: industry 4.0; value stream mapping; agile manufacturing; kaizen; lean manufacturing

1. Introduction

Industry 4.0 production is highly affected by problems and challenges encountered on the shop floor. The problems may present themselves in several forms, including lack of resources, inefficient manpower, a poor working environment, outsourcing, machinery malfunction, and lack of production planning [1,2]. To dispense with these problems, various process optimization approaches have been implemented on the shop floors of many worldwide industries [3,4]. In recent years, lean manufacturing, kaizen, six sigma, total quality management, and lean six sigma have all been implemented as process optimization approaches for improving operational performance on the shop floor [4,5]. The



ELECTRONIC, IR AND THERMAL STUDIES ON BIOLOGICALLY ACTIVE COMPLEX OF Ni (II) WITH BENZIMIDAZOLE OXIMES

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ABSTRACT: The Electronic, IR and Thermal studies on biologically active complexes of Ni (II) has been reported. The bands observed and discussed assuming the molecule under C_s point group symmetry. The IR spectral studies of this compound have been discussed. The thermal study of complex compound has been calculated. The electronic study in nujol phase has been calculated.

Keywords: Electronic Spectra, IR, Thermal studies, EPR and Benzimidazole oxime.

INTRODUCTION:

Extensive studies of various carbonic anhydrases ⁽¹⁾ and alkaline phosphatases ⁽²⁾ indicate the presence of a catalytic Zn^{2+} bound to three imidazole residues of enzyme histidines. In the carboxy peptidases ⁽³⁾ and in thermolysin ⁽⁴⁾, the critical Zn^{2+} is bound to two imidazoles and a carboxylate group of the enzyme. In spite of the obvious interest such systems would have few chelating ligands using imidazole rings have been made so far, and none which combine three simple imidazole rings as models for the metal binding sites of carbonic anhydrase.

Holmes et.al ⁽⁵⁾ have investigated metal binding by 2, 2'-bis (imidazole) (1) while Gruenwedel ⁽⁶⁾ has studied Zn^{2+} and Co^{2+} binding by the tetradentate ligands (2). An important study by Fruton ⁽⁷⁾ led to the synthesis and metal binding constants for bis [4(5) -imidazolyl] methane (3). Fruton's synthesis from histidine is not adaptable for the preparation of related tris (imidazoles). Thompson et.al ⁽⁸⁾ has described some metal binding properties of a tris (benzimidazole) ligand system (4). Finally the tris (pyrazolyl) borohydride ligand (5) first reported by Trofimenko ⁽⁹⁾ but studied by Marks and Ibers ⁽¹⁰⁾. The X-ray studies ⁽¹¹⁾ on carbonic anhydrase show that the three imidazole ligands have distorted tetrahedral coordination to the Zn^{2+} . Molecular models suggested that a similar geometry could be attained with a tris (imidazolyl) methane derivative.



STUDIES ON BIOLOGICALLY ACTIVE COMPLEXES OF Cu(II) WITH BENZIMIDAZOLE OXIMES

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ABSTRACT:

We have study the infra red and electronic spectra in this paper. Widely studies of different carbonic anhydrases⁽¹⁾ and alkaline phosphatases⁽²⁾ indicate the presence of a catalytic Cu²⁺ bound to three imidazole residues of enzyme histidines. In the carboxy peptidases⁽³⁾ and in thermolysin⁽⁴⁾, the critical Cu²⁺ is bound to two imidazoles and a carboxylate group of the enzyme. In spite of the obvious interest such systems would have few chelating ligands using imidazole rings have been made so far, and none which combine three simple imidazole rings as models for the metal binding sites of carbonic anhydrase.

Keywords- UV, IR, NMR and magnetic susceptibility

INTRODUCTION:

Widely studies of different carbonic anhydrases⁽¹⁾ and alkaline phosphatases⁽²⁾ indicate the presence of a catalytic Cu²⁺ bound to three imidazole residues of enzyme histidines. In the carboxy peptidases⁽³⁾ and in thermolysin⁽⁴⁾, the critical Cu²⁺ is bound to two imidazoles and a carboxylate group of the enzyme. In spite of the obvious interest such systems would have few chelating ligands using imidazole rings have been made so far, and none which combine three simple imidazole rings as models for the metal binding sites of carbonic anhydrase.



INFRARED, RAMAN, ELECTRONIC SPECTRAL STUDIES AND EFFECT OF pH OF 4-CHLORO-3-NITRO PHENOL AND 2- CHLORO-4-NITRO PHENOL

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Abstract: The present research paper confined in reporting the investigations of infrared, laser Raman and ultraviolet spectra of 4-chloro-3-nitro phenol and 2-chloro-4-nitro phenol in their respective region. The spectra have been analyzed according to the assumption of C_s point group symmetry and complete vibronic interpretation including assignment of fundamental and group modes [ground and excited state] with effect of substituents are determined. The effect of pH variation on electronic transitions of these compounds in ethanol solvent has been studied. The electronic transition viz. $n-\pi^*$, $n-\pi^*$ and $n-\pi^*$ have also been discussed along with red and blue shift.

Keywords: IR, Raman spectra, Electronic spectra, pH effect

INTRODUCTION

Spectroscopic studies such as infrared, Raman and ultraviolet are widely used in biophysics research on nucleic acid and related compounds. The electronic spectra of phenol and some of its mono and disubstituted phenols have been studied extensively in recent years [4-6]. The electronic transition in phenol exhibit two band system in the near UV region, one towards the longer wavelength side designated as $n-\pi^*$ transition and other towards the shorter wavelength side designated as $n-\pi^*$ transition. The electronic spectra of substituted nitro and hydroxy group also appear in literature [8,9]. In view of these, the present research paper the infrared, laser Raman and ultraviolet spectrum with their complete assignments, ground and excited state fundamentals corresponding to all modes of vibration of 4-chloro-3-nitro phenol and 2-chloro-4-nitro



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Research Article

ULTRAVIOLET ABSORPTION SPECTRA AND EFFECT OF pH OF 2,5-DIMETHOXY THIO PHENOL

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ABSTRACT

The ultraviolet absorption spectra of 2,5-dimethoxy thio phenol has been reported. The ultraviolet absorption spectra of this molecule have been recorded in various solvents (viz. ethanol, methanol and water). The effect of substituents has been discussed. The effect of pH variation in ethanol solvent has been studied.

Keywords:

pH, UV Spectra, ultraviolet absorption spectra

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INTRODUCTION

Spectroscopic studies of phenol and its derivatives received considerable attention in the recent years [1-3]. The studies of phenol derivatives have become quite interesting because they are the constituents of DNA & RNA and hence play a central role in the structure and properties of the nucleic acids. Also phenol derivatives like chlorophenol, aminophenol and marceptophenol etc. are widely used as drugs in certain diseases. Rao [4] have shown that the phenol molecule has planer structure in the ground state and a quasi planer one in the excited state.

The absorption spectra of phenol and its derivatives have been predicted theoretically and practically by various workers [5-7] have found the evidence of the electronic transitions as $\pi - \pi^*$, $\pi - \pi^*$ and $\pi - \sigma^*$. This the detailed study of the electronic transitions of substituted phenols is of importance in order to check the presence of $\pi - \pi^*$, $\pi - \pi^*$ and $\pi - \sigma^*$. Thus the detailed study of the electronic transitions of substituted phenols is of importance in

order to check the presence of $\pi - \pi^*$, $\pi - \pi^*$ and $\pi - \sigma^*$ transition [8-10].

In view of the above discussion, the present research paper reports the ultraviolet spectra in different solvents (viz., ethanol methanol and water) and effect of pH of the 2,5-dimethoxy thio phenol is reported and discussed.

EXPERIMENTAL DETAILS

98% spec-pure grade sample of 2,5-dimethoxy thio phenol (abbreviated as 2,5-DMTP) was obtained from M/s Sigma Aldrich Chemic, West Germany and used as such without further purification. However, their purity was confirmed by elemental analysis and melting point determination [120-124°]. The experimental technique in the ultraviolet spectra of 2,5-DMTP was recorded on Beckman Spectrophotometer model-35 in the region 2000-3500Å. The spectra have been recorded in various solvents (viz. ethanol, methanol and water). The concentration of the solution in all the cases was kept constant (8×10^{-3} gm/liter). All the solvents used was of spectroscopic grade. The ratio of pure solvent was obtained at 9:1 by volume.

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Adaptive grey model (AGM) approach for judgemental forecasting in short-term manufacturing demand

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ABSTRACT

The covid-19 pandemic has created problems in every manufacturing sector and has posed considerable challenges to pharmaceutical, healthcare, and sanitation companies. The challenges faced are particularly daunting for pharmaceutical companies producing vaccines with ever-growing demand and shorter and shorter deadlines to fulfill them. Further, due to the vaccine's novelty and unprecedented demand, there is a lack of any available data on which traditional forecasting methods can be used. In this paper, we attempt to propose a solution by utilizing the Grey Systems Theory, particularly the AGM (1, 1) model, which has been used to significant effect for problems involving uncertain / lack of data to forecast the demand for vaccines. The experimental results obtained showed that our proposed model successfully generated accurate forecasts with a small dataset and minimal error. Additionally, judgmental forecasting has been used to qualitatively assess the future scope of vaccine manufacturing as well as the use cases of the model. We can thus effectively say proposed AGM (1,1) model is a lucid method to forecast the demand for vaccines.

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1. Introduction

The worldwide pandemic COVID-19 has unveiled a new problem for forecasting models, especially in the bio/pharma manufacturing sector. The pharmaceutical industry has been improving its workings with experience and is efficiently streamlining its processes, but the COVID-19 Pandemic introduced previously unseen challenges. However, it has grown to handle this crisis in a short span of time. From the development of the vaccines to their supply to meet the exponentially increasing demand, the industry has created a scientific equivalent of the Wirtschaftswunder, the rapid reconstruction of German industry following the destructive events of World War II. One prevalent practice in this industry is to develop products in-house rather than outsourcing their activities to avoid delays in production due to the transfer of technologies. Hence, most organizations attempt to increase their production capacities within their organization. For example, quite

a few domestic facilities in India have considered offering cutting-edge manufacturing practices and large-scale capacity for the production of vaccines in order to cater to national and international markets. However, this increase in the manufacturing speed of vaccines has resulted in sub-optimal practices being implemented industry-wide, which require further improvements to enhance the process and to restore the balance in supply and demand (Fig. 1).

The mass production of vaccines in a short time is something all vaccine manufacturers are under equipped to handle due to the lack of data in this area. However, this issue does not reduce the need for greater efficiency and optimisation. Thus, there is an urgent need, now more than ever, for a forecasting model which has the ability to work with a small amount of data. There was a need for a methodology to solve such problems, which involved very few data points and unclear information. Julong Deng, in the year 1982, first suggested such a technique which he named the Grey Systems Theory. For such time series forecasting with limited information, grey models are used. 'Grey' here refers to the uncertainty/ unavailability of information at hand. GM (1,1) is the

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
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Selection and peer-review under responsibility of the scientific committee of the First International Conference on Design and Materials (ICDM)-2021.



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791–801

Study of Human and Robot Social Interaction Using Artificial Cognition Methods

Mohd. Sadim  & Bhupendra Kumar

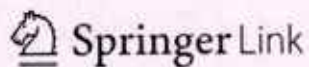
Conference paper | First Online: 24 April 2021

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Part of the Algorithms for Intelligent Systems book series (AIS)

Abstract

Human–robot interaction challenges artificial intelligence in numerous regards: dynamic, somewhat obscure conditions that were not initially intended for robots; a wide scope of circumstances with rich semantics to comprehend and decipher; physical associations with people that require fine, low inactivity, yet socially satisfactory control systems; regular and multi-modal correspondence. This paper is an endeavor to describe these difficulties and to introduce a lot of key dynamic issues that should be tended to for an intellectual robot to effectively



Query Optimization of Corporate Service Quality Using Log Shipping Architecture

Recent Trends in Thermal Engineering pp 231-242 | Cite as

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Conference paper

First Online: 05 August 2021

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Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

Abstract

The current research is an empirical assessment of measuring the effectiveness of the application of query optimizing log shipping architecture in corporate India. Theoretically stating, the major aim of integrating such database architecture at a workplace aims at reducing the technical debt and number of fixes required along with increasing the efficiency of maintenance of transaction logs and data retrieval with avoidance of any kind of failure. This research study has been conducted in order to verify the efficiency of the working of these optimizers in the corporate world. Thus, the major objective of this research is to measure the effectiveness of the stipulated database architecture through various variables of service quality including reliability, responsiveness, security, competence and durability. The study further aims at examining the impact of these variables on the effectiveness of the stipulated architecture. The sample included the technical staff working in the corporate sector in the technical or IT department in several companies located in Delhi-NCR based on convenience sampling. The data were collected through a self-structured questionnaire that was floated to online to the respondents comprising a total sample of 400 respondents. The questionnaire was reliable as the Cronbach's alpha was greater than 0.75. Its validity was also checked by some professionals in this field along with some academicians working for the same. Multiple regression analysis has been used to examine the impact of the given variables on the effectiveness of the query optimizing log shipping architecture at the workplace. The results provided insights regarding the level

Effect of Ph and Ultraviolet Spectral Studies of 2,5- Dimethoxy Thio Phenol

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Abstract:- The ultraviolet spectra of 2,5-dimethoxy thio phenol has been recorded in the region 2000-3500Å. The electronic absorption spectra has been recorded in various solvents (viz. ethanol, methanol and water). The effect of substituents has been discussed. The effect of pH variation in ethanol solvent is also studied and discussed.

Keywords: electronic absorption spectra, pH effect and solvent effect.

INTRODUCTION

Spectroscopic studies of phenol and its derivatives received considerable attention in the recent years [1-3]. The studies of phenol derivatives have become quite interesting because they are the constituents of DNA & RNA and hence play a central role in the structure and properties of the nucleic acids. Also phenol derivatives like chlorophenol, aminophenol and marceptophenol etc. are widely used as drugs in certain diseases. Phenol and its derivative are extensively used as a solvent as a synthetic intermediate in analytical chemistry. So, the knowledge of the molecular structure, physio-chemistry properties and vibrational properties of phenol and its derivatives is helpful for a better understanding of their function in several biological processes and analysis of the complex systems. Sunderaganeshan [4] have shown that the phenol molecule has planer structure in the ground state and a quasi planer one in the excited state.

The absorption spectra of phenol and its derivatives have been predicted theoretically and practically by various workers [5,6] have found the evidence of the electronic transitions as $\pi - \pi^*$, $\pi - \pi^*$ and $\pi - \sigma^*$. This the detailed study of the electronic transitions of substituted phenols is of importance in order to check the presence of $\pi - \pi^*$, $\pi - \pi^*$ and $\pi - \sigma^*$. Thus the detailed study of the electronic transitions of substituted phenols is of importance in order to check the presence of $\pi - \pi^*$, $\pi - \pi^*$ and $\pi - \sigma^*$ transition [7,8].

In view of the above discussion, the ultraviolet spectra in different solvents (viz., ethanol methanol and water) of the 2,5-dimethoxy thio phenol is reported and discussed [5,9].

EXPERIMENTAL DETAILS

98% spec-pure grade sample of 2,5-dimethoxy thio phenol (abbreviated as 2,5-DMTP) was obtained from M/s Sigma Aldrich Chemic, West Germany and used as such without further purification. However, their purity was confirmed by elemental analysis and melting point determination [120-124°]. The experimental technique in the ultraviolet spectra of 2,5-DMTP was recorded on Beckman Spectrophotometer model-35 in the region 2000-3500Å. The spectra have been recorded in various solvents (viz. ethanol, methanol and water). The concentration of the solution in all the cases was kept constant (8×10^{-3} gm/liter). All the solvents used was of spectroscopic grade. The ratio of pure solvent was obtained at 9:1 by volume.

RESULTS AND DISCUSSION

The molecular structure of 2,5-dimethoxy thio phenol is given in fig-1.

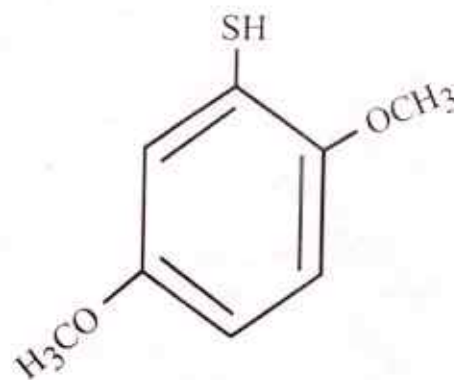



Fig. 1 : Molecular structure of 2,5-DMTP

The observed ultraviolet bands of said molecule are given in Table-1. The ultraviolet absorption spectra of the



Experimental investigation and parametric optimization of the hole-circularity and taper angle during laser drilling kevlar-29 fiber composite

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Abstract

Laser beam drilling (LBD) is the best alternative to the traditional drilling operation in KFRP drilling due to reduced fiber delamination, burr formation, no tool wear and matrix cracking. In this research work, Hole circularity and Taper angle have been observed experimentally at varied settings of the lamp current, pulse frequency and air pressure and during pulsed Nd:YAG laser drilling of 1.2mm thick Kevlar-29 composite laminate. For understanding and achieving better hole circularity at proper taper angle, series of laser drilling experiments have been performed on a fiber composite. Hole- circularity and taper angle are measured for each laser drilled hole and obtained the optimum parameter by using Taguchi methodology. Based on parametric analysis, it has been found that lamp current is the most significant factor for the hole circularity while air pressure for taper angle is most significant.

Introduction

In recent years, the most advancement has been used in fiber reinforced composite laminate. Several studies have been done in the last decade regarding the benefits and suitability of Kevlar fibers in the



ELECTRONIC AND IR SPECTRAL STUDIES ON BIOLOGICALLY ACTIVE COMPLEXES OF Co(II) WITH BENZIMIDAZOLE OXIMES

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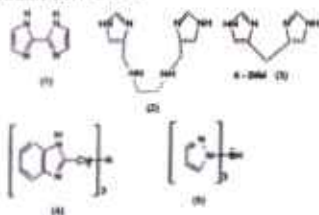
ABSTRACT We have study the infra red and electronic spectra in this paper. Widely studies of different carbonic anhydrases (1) and alkaline phosphatases (2) indicate the presence of a catalytic Co^{2+} bound to three imidazole residues of enzyme histidines. In the carboxy peptidases (3) and in thermolysin (4), the critical Co^{2+} is bound to two imidazoles and a carboxylate group of the enzyme. In spite of the obvious interest such systems would have few chelating ligands using imidazole rings have been made so far, and none which combine three simple imidazole rings as models for the metal binding sites of carbonic anhydrase.

KEYWORDS : Electronic, Infra red Spectra, Biological study

INTRODUCTION:

Extensive studies of various carbonic anhydrases⁽¹⁾ and alkaline phosphatases⁽²⁾ indicate the presence of a catalytic Co^{2+} bound to three imidazole residues of enzyme histidines. In the carboxy peptidases⁽³⁾ and in thermolysin⁽⁴⁾, the critical Co^{2+} is bound to two imidazoles and a carboxylate group of the enzyme. In spite of the obvious interest such systems would have few chelating ligands using imidazole rings have been made so far, and none which combine three simple imidazole rings as models for the metal binding sites of carbonic anhydrase.

Futon's⁽⁵⁾ synthesis from histidine is not adaptable for the preparation of related tris (imidazoles). Thompson et.al⁽⁶⁾ have described some metal binding properties of a tris (benzimidazole) ligand system⁽⁴⁾. Finally the tris (pyrazolyl) borohydride ligand⁽⁵⁾ first reported by Trofimenko⁽⁷⁾ but studied by Marks and Ibers. The X-ray studies⁽⁸⁾ on carbonic anhydrase show that the three imidazole ligands have distorted tetrahedral coordination to the Co^{2+} . Molecular models suggested that a similar geometry could be attained with a tris (imidazolyl) methane derivative⁽⁹⁾.



Benzimidazole complexes of transition metals exhibit interesting spectral and magnetic properties⁽¹⁰⁻¹²⁾. Oxime function located adjacent to another donor atom in an organic molecule, can act as a versatile chelating group and may make the molecule useful in the separation and estimation of metal ions⁽¹³⁾. These considerations prompted us to synthesise new polydentate ligands containing both oxime and imidazole functions together. Here we discuss the synthesis and characterization of the complexes of 2-Acetyl-4-methyl benzimidazole oxime (ACMBZOXH_2) or 2-benzoyl-4-methyl benzimidazole oxime (BzMBzOXH_2) with Co(II) .

EXPERIMENTAL:

Material and Methods: The chemicals used were of AR or equivalent purity, 4-Methyl-2-Acetyl benzimidazole and 4-methyl-2-benzoyl benzimidazole were prepared by the reported methods⁽¹⁴⁾. Their oximes were prepared by refluxing the ketone and hydroxylamine hydrochloride in ethanol in presence of pyridine. The excess of ethanol was removed by distillation or evaporation oximes were purified by recrystallisation from methanol-benzene mixture.

Synthesis of Complexes: To an ethanolic solution of 2-Acetyl benzimidazole oxime (0.005 mol), metal (II) chloride/nitrate/sulphate (0.005 mol) in the same solvent or metal(II) acetate in water was added. The resulting mixture was refluxed on a water bath for 2-hour cooled and filtered, washed with ethanol and dried over phosphorous pentoxide.

In the synthesis of 4-methyl-2-benzoyl benzimidazole oxime complexes, the ligand (0.005 mol) was dissolved in the minimum quantity of ethanol and metal(II) chloride/acetate (0.005 mol) in water

was added. The resulting precipitate was refluxed on a water bath for 2-hour cooled, filtered and washed with aqueous ethanol and dried, over phosphorous pentoxide.

RESULTS AND DISCUSSION:

The elemental analysis of the complexes along with their magnetic moment data are given in table-1. The complexes are insoluble in common organic solvents except in DMF, DMSO and pyridine. The molar conductances of 10^{-3}M DMF-solutions of the complexes were found to be in the range 7-30 $\text{mho cm}^2 \text{mol}^{-1}$. The slightly higher values than those of expected for non electrolytes indicate the solvation of the complexes resulting in the displacement of anion from coordination sphere by strong donor DMF molecules. The complexes may be regarded as non electrolytes.

Magnetic Properties: The cobalt(II) complexes $[\text{Co}(\text{C}_{10}\text{H}_{12}\text{N}_2\text{O})_2]\text{Cl}$ and $[\text{Co}(\text{C}_{10}\text{H}_{12}\text{N}_2\text{O})_2]2\text{H}_2\text{O}$ show moment values of 3.95 and 4.02 B.M. respectively. These are much lower than the values expected for tetrahedral (4.2 - 4.7 B.M.) or octahedral (4.7 - 5.2 B.M.) cobalt(II) complexes. This lowering of magnetic moment may be explained by assuming the co-existence of high spin as well as low spin states of $\text{Co(II)}(t_{2g}^5 e_g^2 \rightarrow t_{2g}^6 e_g^1)$ the presence of antiferromagnetism or the polymeric nature of the complexes.^(10,11)

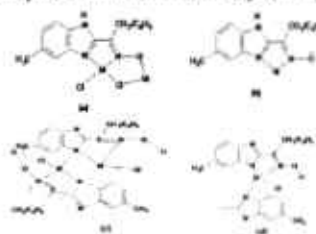
The μ_{eff} value of $[\text{Co}(\text{C}_{10}\text{H}_{12}\text{N}_2\text{O})_2]2\text{H}_2\text{O}$ (4.90 B.M.) agrees very well with the expected value for octahedral cobalt(II).

Electronic Spectra:

The electronic spectra of $[\text{Co}(\text{C}_{10}\text{H}_{12}\text{N}_2\text{O})_2]\text{Cl}$ showed a multi component band at 14315 cm^{-1} which is typical of a tetrahedral cobalt(II) complex. This is assigned to ν_1 -band resulting from ${}^4\text{T}_1(\text{P}) \rightarrow {}^4\text{A}_1$ transition. The band observed at 6896 cm^{-1} may be taken as ν_2 band ${}^4\text{T}_1(\text{F}) \rightarrow {}^4\text{A}_1$. The spectrum of $[\text{Co}(\text{C}_{10}\text{H}_{12}\text{N}_2\text{O})_2]2\text{H}_2\text{O}$ was quite different from that of $[\text{Co}(\text{C}_{10}\text{H}_{12}\text{N}_2\text{O})_2]\text{Cl}$ and showed two bands at 20490 and 7145 cm^{-1} . These are assigned to the transitions ${}^4\text{T}_1(\text{P}) \rightarrow {}^4\text{T}_1(\text{F})$ and ${}^4\text{T}_1(\text{P}) \rightarrow {}^4\text{T}_2(\text{F})$ respectively of octahedral Co(II) complex. The ν_2 -band, since it involves a two electron transition was not observed. Its position was calculated using konig equation.⁽¹²⁻¹⁶⁾ The various ligand field parameters (Dq , B_2 , ν_2/ν_1 and LFSE) have been calculated. The ν_2/ν_1 ratio for $[\text{Co}(\text{C}_{10}\text{H}_{12}\text{N}_2\text{O})_2]2\text{H}_2\text{O}$ is found to be in the range (2.1 - 2.2) which is reported for octahedral cobalt(II) complexes.^(17,18) Satisfactory electronic spectrum could not be obtained for $[\text{Co}(\text{C}_{10}\text{H}_{12}\text{N}_2\text{O})_2]2\text{H}_2\text{O}$.

Infrared Spectra:

A comparison of the infrared spectra of the ligands and their complexes indicated that the benzimidazole oximes were coordinated to the metal in the present complexes in four different ways (a - d)



FLC based speed control of Induction Motor

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Abstract. Speed control of induction motor is utilized for blowers, fans and many other applications. AC voltage regulators are used in induction motors to arrange the speed. This technique features the shrewd controllers such as the Fuzzy controller ac voltage controllers to produce the firing signals for thyristors concerning a given operating torque, speed of the motor, and the load. Fuzzy models have been intended to accomplish the proposed calculation. MATLAB/SIMULINK is utilized to reproduce the proposed strategies. The upside of such controller is its straightforwardness, security, and high precision contrasted with the regular numerical figuring of the firing signals which is a complex and tedious errand particularly in online control applications. The significant attribute of the FLC system is to improve robustness. The mathematical model of the drive framework is created utilizing the phase variable model. The created model is simulated using MATLAB/SIMULINK; since it provides a convenient tool to analyze the system precisely so the outcomes obtained are very satisfactory and promising

Keywords: Control System, PID controller, Fuzzy logic control, Framework Modeling, Induction Motor (3-phase), MATLAB / SIMULINK

1. INTRODUCTION

Three phase Induction motor has wide application and demand in today's life as in residential, commercial and industrial application. It is utilized in lifts, cranes, hoists, large capacity exhaust fans, lathe machines, crushers, oil extracting mills and textile industry etc.[1,2] So the performance of three phase induction motor is quite remarkable which can be affected by the large rotor current. If it cannot be controlled or monitored, it would affect extremely in the area of high power demand.

AC regulator which is the combination of thyristors, TRIAC, SCRs can be used to overcome such situations. The ac voltage regulator changes the fixed voltage and fixed frequency of the input to a variable voltage. Ac voltage-controller-based starters have some merits over conventional starters as: smooth acceleration, which reduces the stress on the mechanical drive system [3]. An adaptive approach using Adaptive Pole Placement Control was applied for controlling speed of three-phase induction motor [4], which shows better performance than PID controller. Slip and speed control via



A Short Review on 3-d Printing of FRP Composites Using Stereolithography

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ABSTRACT

A higher product diversification range with excellent physical, mechanical and chemical properties make Fiber-reinforced polymer (FRP) composite materials a prominent candidate for engineering applications. But, conventional manufacturing techniques always face critical issues during the development of FRP's complex and intrinsic profile. In recent years, Additive Manufacturing (AM) or 3-D printing proves itself a robust technique to produce application-specific parts of FRP composites with a higher degree of customization. In comparison to other 3D printing techniques, Stereolithography (SLA) is able to create mechanically stable objects with higher processing speed. This information paves the way for the present review article. This paper reviews the recent advancement of SLA technique to develop objects of FRP composite materials.

Keywords: 3D printing; fiber; Polymer composite; Stereolithography.

INTRODUCTION

In recent decades, 3D Printing or additive manufacturing (AM) technique is emerged as a robust rapid tooling and manufacturing technique to produce parts having complex geometries with reduced volume of the waste material (Frketic, Dickens, & Ramakrishnan, 2017). Higher versatility at low cost of 3D printing technique is continuously increasing its applications in the automotive, biomedical, aerospace, design etc. industries. Its higher customizability makes it suitable to fabricate complex structures and intrinsic profiles (Kothman & Faber, 2016; Noorani, 2017; Yan et al., 2018).

In 1986, Charles Hull demonstrated this technique as a material joining process in successive layers to make objects by using data of its 3D model. This technique consists four phases such as 3D CAD modelling, STL file creation, slicing and printing. In the initial phase, a CAD software is employed to prepare a meshed 3D model of the required object. Then, a STL (Surface Tessellation Language) file is developed for the prepared 3D model. In the next phase, mesh data of the model is sliced into the 2D layers. Thereafter, this 2D sliced data is sent to the suitable machine for 3D printing of the object (Hull, 2015; Wong & Hernandez, 2012).

In industries, 3D printing technique is majorly using for printing of single material objects. Thereby, improvements in the physical and chemical properties of printed parts are limited. This is a very serious issue which limits the industrial applications of 3D printing. To overcome this issue, various researchers have focused on multi-material printers to fabricate composite materials. These printers are also partially able to control the properties and compositions



Advances in Energy Technology, pp 371–387

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Study on Implementation of Various Approaches for Shop Floor Management

[Varun Tripathi](#), [Suvandan Saraswat](#) & [Girish Dutt Gautam](#)

Conference paper | [First Online: 28 July 2021](#)

1171 Accesses | **8** Citations

Part of the [Lecture Notes in Electrical Engineering](#) book series (LNEE, volume 766)

Abstract

To develop a robust management system, nowadays, worldwide industries are emphasizing to implement an efficient approach for shop floor management. In the present scenario, several approaches are used for shop floor management to identify and eliminate non-value-added activities of the production. The main aim of the present research paper is to describe the selection and implementation of approaches by researchers and industry persons for shop floor management and to identify a superior approach from the investigation of results found in previous research work. The novelty of this paper lies in the fact that few such studies have been