A HYBRID APPROACH FOR OPTIMIZED VIDEO COMPRESSION USING DEEP RECURRENT AUTO ENCODERS (DRAE) TECHNIQUE

Mr. KOMMERLA SIVA KUMAR [1], Dr. P. BINDHU MADHAVI [2], Dr.K. JANAKI [3]

[1] Assistant Professor, CSE Department, R.V.R & J.C College of Engineering,
Andhra Pradesh.
[2] Professor & HOD, Department of AI & ML, The Oxford College of Engineering,
Karnataka.
[3] Associate Professor, Department of CSE-AI, Faculty of Engineering,
Jain Deemed to be University, Karnataka.

kommerlasivakumar@gmail.com. bindhu.prathipati@gmail.com. karur.janaki@gmail.com

ABSTRACT

Presently, the data traffic is increasing for video conferencing, online education, gaming and watching videos on Netflix, Amazon Prime, YouTube and other OTT platforms. And, the service users are always demanding high definition and high-quality video facilities day by day. However, in order to transmit video data across the Internet's constrained bandwidth effectively, video compression is a necessary task. In last few decades, various video compression algorithms, such as non-learning and learning were standardized. But still some improvements are needed for effective video related services. We propose a deep learning based Deep Recurrent Auto Encoders (DRAE) approach which contain various modules for implementing an efficient video compression technique. The experimental outcome shows our model achieves state-of-the-art learned video compression performance in terms of both PSNR and MS-SSIM.
Keywords: Video, Compression, Deep Neural Networks, Recurrent Auto Encoders.

1.   INTRODUCTION

Nowadays, video content contributes to more than 80% internet traffic, and the percentage is expected to increase even further. Therefore, it is critical to build an efficient video compression system and generate higher quality frames at given bandwidth budget.

Modern digital video looks as impressive as it does is because of the sheer amount of information digital cameras can capture. This informational data is what creates the crisp details and vivid saturation of modern video. The problem is that it takes a ton of data to capture these beautiful videos. So much data that you may find your computers and hard drives filling up quickly due to the hefty storage demands of your video, not to mention the extremely long wait times for uploading or sharing these videos to online platforms. Luckily, compression offers the solution of taking the vast amounts of data that cameras generate and interpreting it in a way

that is more efficient, creating new files that are only a fraction of the file size! The only way you'll be able to share, upload, stream and store all of your great video content with any regularity is by compressing it. The trick is to know "good" compression from "bad" compression. The objective of "good" compression is to minimize the file size as much as possible with the least amount of image quality reduction by removing things like redundant or non-functional data from your video file.

Internet traffic has recently been dominated by video-related applications including video on demand (VOD), live streaming, and ultra-low latency real-time communications.

Due to the ever-increasing demands for resolution ([1] and [2]), and fidelity, more effective video compression is required for content transmission and storage, and therefore for successful implementation of networked video services ([3], [4]). Video compression systems develop suitable techniques to reduce

Original Research Paper

An Efficient Video Compression Framework using Deep Convolutional Neural Networks (DCNN)

[1]Kommerla Siva Kumar, [2]P. Bindhu Madhavi and [3]K. Janaki

[1]*Department of Computer Science and Engineering, R.V.R and J.C College of Engineering, Andhra Pradesh, India*
[2]*Department of AI and ML, The Oxford College of Engineering, Karnataka, India*
[3]*Department of Computer Science and Engineering-AI, Faculty of Engineering, Jain Deemed to be University, Karnataka, India*

Abstract: In the current world, video streaming has grown in popularity and now accounts for a large percentage of internet traffic, making it challenging for service providers to broadcast videos at high rates while utilizing less storage space. To follow inefficient analytical coding design, previous video compression prototypes require non-learning-based designs. As a result, we propose a DCNN technique that integrates OFE-Net, MVE-Net, MVD-Net, MC-Net, RE-Net, and RD-Net for getting an ideal collection of frames by linking each frame pixel with preceding and following frames, then finding linked blocks and minimizing un needed pixels. In terms of MS-SIM and PSNR, the proposed DCNN approach produces good video quality at low bit rates.

Keywords: Deep Neural Networks, Encoding, Decoding, Video Compression

Introduction

People who watch videos on the internet are about 90%, this is expected to rise in the near future. As a result, an effective video compression model is required to deliver higher-quality frames while using less bandwidth.

Video codecs compress videos using hand-drawn models. Despite their superb design, the present models are poorly optimized. The video compression process can be improved even more by tweaking the entire codec model.

Deep neural networks have outperformed classic picture codecs like the Joint Photographic Experts Group in video compression. Deep neural network-based models that rely on extremely nonlinear transformations require end-to-end training.

It's not easy to create a model that uses a variety of video compression algorithms. Motion estimation, which creates and compresses motion data, is the most important part. To remove temporal redundancy, video compression significantly relies on motion information. The only way to express motion vectors is to use an optical flow net. Although learning-based optical flow estimation focuses on obtaining exact flow data, proper optical flow isn't always the best solution for specific video applications. Furthermore, the ability of optical flow data is greater than that of existing models, resulting in high bit rate information when optical flow values are directly compressed using existing methods.

Reduced rate-distortion aims to provide higher-quality reconstructed frames at the same bit rate. It is essential for proper video compression to technique.

Rate distortion must be decreased to achieve the benefits of end-to-end training for deep learning-based video compression models. The following are the model's key benefits: All steps of the DCNN model are implemented using deep neural networks. The DCNN model is based on rate-distortion and uses a single loss function to combine all of the steps, resulting in a high compression ratio. This study will aid researchers working on computer vision, video compression, and deep model creation.

Related Work

Kumar and Janaki (2020), the video compression task can be categorized into three types. They are the classical era, the era of generic heuristics, and the era of modern techniques with deep learning. Through the detailed study of the literature through the past decades, it is learned that various schemes have been proposed for video compression. These schemes have contributed a lot of efficient mechanisms in different ways. However, further improvements are also needed towards the same pertaining to the limitations observed as specified.

Birman *et al.* (2020), illustrate and explain various issues for the video compressionprocess in the field of DNNs. ,Still

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We introduce DCNN and DRAE appraoches for compression of medical videos, to decrease file size and storage requirements, there is an increasing need for medical video compression nowadays. Using a lossy compression technique, a higher compression ratio can be attained, but information will be lost, and possible diagnostic mistakes may follow. The requirement to store medical video in lossless format results from this. The aim of utilizing a lossless compression tool is to maximize compression because the traditional lossless compression technique yields a poor compression ratio. The temporal and spatial redundancy seen in video sequences can be successfully utilized by the proposed DCNN and DRAE encoding. This paper describes the lossless encoding mode and shows how a better compression ratio can be achieved.

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I. Introduction

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Research Article

FCN Network-Based Weed and Crop Segmentation for IoT-Aided Agriculture Applications

Shoaib Kamal [ID],[1] **Vaishali Gajendra Shende,**[2] **Korla Swaroopa,**[3] **P. Bindhu Madhavi,**[4] **Patan Saleem Akram,**[5] **Kumud Pant,**[6] **Shantala Devi Patil,**[7] **and Kibebe Sahile** [ID][8]

[1]*Department of Electronics and Communication Engineering, MVJ College of Engineering, Channasandra, Kadugodi, Bengaluru, Karnataka 560067, India*
[2]*Department of Information Science and Engineering, East Point College of Engineering and Technology, Bengaluru, Karnataka 560049, India*
[3]*Department of Computer Science and Engineering, Aditya Engineering College, Surampalem, East Godavari District, Andhra Pradesh 533437, India*
[4]*Department of Computer Science & Engineering, The Oxford College of Engineering, Bengaluru, Karnataka 560068, India*
[5]*Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation (Deemed to be University), Vaddeswaram, Andhra Pradesh 522502, India*
[6]*Department of Biotechnology, Graphic Era Deemed to be University, Dehradun, Uttarakhand 248002, India*
[7]*Department of Computer Science and Engineering, REVA University, Bengaluru, Karnataka 560064, India*
[8]*Department of Chemical Engineering, College of Biological and Chemical Engineering, Addis Ababa Science and Technology University, Ethiopia*

Correspondence should be addressed to Shoaib Kamal; shoaibkamal87@gmail.com and Kibebe Sahile; kibebe.sahele@aastu.edu.et

The main purpose of the work is to evaluate the deep machine learning algorithms used for the distinction between weeds and crop plants using the open database of images of the carrot garden. Precision farming methods are highly prevalent in the agricultural environment and can embed intelligent methods in drones and ground vehicles for real-time operation. In this work, the accuracy of the weed and crop segment is analyzed using two different frameworks of deep learning for the semantic segment: the fully convolutional network and the ResNet. An open database with images of 40 plants and weeds was used for the case study. The results show a global accuracy of more than 90% in the verification package for both structures. In the second experiment, new FCN networks were trained to evaluate the impact of these processes on different image preprocessing and separation performance by different training/testing rates of the dataset.

1. Introduction

The greater global demand for food demands greater agricultural production from the rural environment. Advances in technology have helped to increase and improve the agribusiness. The field mechanization process of recent decades is an example of the attempt at large-scale production. However, there are several issues with this production being ecologically sustainable. The origin of invasive plants is considered natural in rural environments. However, it is necessary to act quickly to eliminate the presence of weeds before consuming the resources in the garden to prevent the decay of the cultivated plants [1]. In general, invasive plants or weeds are species that are born without human assistance; i.e., they occasionally grow in the soil and begin to compete for light and nutrients, which inhibits the growth of the crop. In addition, weeds spread rapidly and in large numbers, competing with other plants for space [2]. Depending on climatic conditions, soil type, and extent of attack [3], weeds can cause up to 70% loss in original plantings. They can

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Human beings have the most distinctive feature that is human face. We can exchange somebody faces with anybody else's faces that appear realistic because many have another type of algo is based upon deepfake tech. Deepfake videos / photos is revolutionary subdual of AI tech by using someones human face can overwrite of someones face. More generously, with many different methods based on productive pictures. Unwillingly the overuse of smartphone and organizing by multiple internet web using AI manipulated data is reaching quicker in something which can we see in the 20th century, global danger is made up by these products Deepfakes are digital manipulation techniques that use machine learning to produce misleading videos. Identification is most difficult part to find from the original. Previously, CNN networks were used to perform identify the deep fake verification. Due to the increasing popularity of deep fakes identification of real one is more important find ways to detect manipulated videos that are presented as real ones. In this project, we will study different methods that can be used to detect such images as well as videos. This study shows that they can also be done using a convolutional algorithm known as Efficient Net and Inception Net. In this Paper, we compare various versions of Convolutional Inception Net with various versions of convolutional Efficient Net combined with Vision Transformers and different Data files to obtain best possible results in Deepfake detection. To get the highly accurate percentage to identify the video is fake or real by using efficient net and by inception net. tract)

On the Review of Dehazing Methods for Bad Weather Images

R. Suganya[*], Dr.R. Kanagavalli[#]

Department of Computer Science and Engineering*, Department of Information Science and Engineering[#]
New Horizon College of Engineering[*], The Oxford College of Engineering[#]
Bengaluru, India

Abstract — *This paper reports the collective review on the proposals from the literatures related to image enhancement in outdoor scenes. Images captured in natural environment are subject to bad weather conditions including haze, mist and fog which would spoil the appearance of images. Edge, contrast and brightness are the features usually affected in an image because the fog pixels blur total scene and spoil the edges. Since the quality of images is ruined, they turn to be useless for any type of evaluation. This problem is very serious in online applications not limited to driving assistance, satellite imageries and defense applications. Therefore, a thorough conceptual study on all the existing methods to mitigate the haze in the images had been presented in this paper. Results from earlier works were compared based on the Peak Signal to Noise ratio, Structural Similarity index metric, Percentage of saturated pixels, Visible Edges ratio, and Perceptual haze density metrics. Ultimately, few suggestions to improve the dehazing performance have been presented.*

Keywords — *Image enhancement, Fog removal, driving assistance, chaos and Road traffic images*

I. INTRODUCTION

Acquiring indoor images is pretty simple and mostly does not involve any post processing. The same is very critical in outdoor imaging, since the light from the scene element is scattered due to natural or artificial light sources. So, quality of images acquired at outdoor is highly dependent on atmospheric conditions. Moreover, the variation in contrast is an exponential decay through the depth of the image. Prevailing intelligent methods for surveillance, recognition, navigation and classification based on image processing exist at the mercy of quality features hidden in an image. Hence, it is vital to enhance the images prior to using the images for needy applications.

This survey is envisioned to present the existing enhancement algorithms in spatial domain, time domain and frequency domain along with its strengths and weaknesses. Of course, enhancement would mean any one or all of the parameters such as; Brightness, Contrast, Color, Edges, Blur etc. It is widely seen that the researchers had focused on appropriate algorithms only to specific applications to enhance the image content. Nonetheless, most of the dehazing algorithms contain the sequence as mentioned in Fig. 1. The steps include depth map estimation, atmospheric light and transmission map estimation, refinement of depth map, restoration model estimation and recovery of haze free image.

This review paper has been organized as follows. Section II presents clear picture on how the images are degraded based on the atmospheric conditions. Section III offers discussion on existing popular dehazing algorithms along with merits and demerits observed on those research works. Section IV narrates the metrics conventionally used in de-hazing algorithms along with newly proposed metrics. Section V gives a conclusive remarks and future enhancements to be carried out.
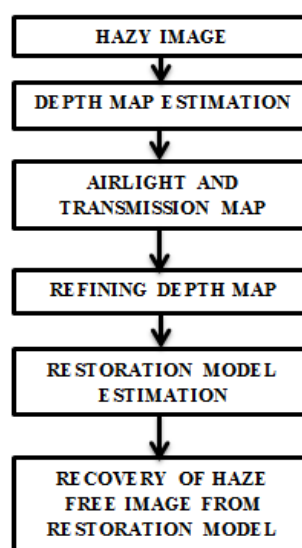

Fig. 1 Sequence of dehazing operations

II. IMAGE DEGRADATION MODEL

A. Origin of image degradation

Prior to disclose the image degradation model, it is essential to review the source atmospheric conditions responsible for degradation. There exist two poor weather conditions: Steady and Dynamic conditions [1]. Haze, fog and mist are caused due to the atmospheric particle of sizes 1-10 µ.m. The case is

UPQC BASED POWER QUALITY IMPROVEMENT OF SOLAR PHOTOVOLTAIC SYSTEMS USING ANFIS AND MFA

MadhaviDasari[1] , Dr. V.S. Bharath[2], Dr.Madhu Palati[3], Dr D M Ganapathi[4]

[1]Assistant Professor, Dept. of EEE, R R Institute of Technology, VTU, Karnataka,
India. E-mail: madhavi.81d@gmail.com

[2] Professor& HOD, Dept. of EEE, The Oxford College of Engineering, VTU, Karnataka,
India, E-mail:bharathpg2002@gmail.com

[3]Assistant Professor, Dept. of EEE,BMS Institute of Technology & Management, VTU, Karnataka,
India. E-mail: madhupalati@bmsit.in

[4]Professor& HOD, Dept. of EEE, East Point Institute of Technology, VTU, Karnataka, India

Abstract:

The ability of energy to reach consumer devices is determined by the quality of the power that was used to create it. Using a Unified Power Quality Conditioner (UPQC) improves the power quality on feeders in distribution system. The Unified Power Quality Conditioner is the most effective customized power equipment available in the market. An UPQC system with a three-phase bus that is fed by PV is modeled and tested. Sagging is caused by heavy loads, whereas swelling is caused by light loads. Solar arrays fed by UPQC are becoming increasingly popular as a means of reducing the severity of these power quality issues. The ANFIS–PSO basedMPPT method has no extra sensor requirement for measurement of irradiance and temperature variables. The employed methodology delivers remarkable driving control to enhance PV potential extraction.The Classical maximum power point tracking (MPPT) techniques, developed for uniform solar radiation on PV arrays such as P&O algorithm sometimes, are unable to discriminate between local and global maximum power points. Therefore, this research under partial shading condition (PSC) is aimed for enhancing the efficiency of the PV system by using modernistic techniques such as ANFIS-Particle Swarm Optimization (ANFIS-PSO), and ANFIS BASED Modified Firefly Algorithm (ANFIS- MFA). The main function of each algorithm is to find the optimal duty cycle for the DC-DC converter in order to increase the output power and efficiency. The P&O algorithm shows larger convergence time with high oscillation as compared with the other three algorithms which showed success in finding and tracking the GMPP, especially the last algorithm (MFA), as it was characterized by its speed, efficiency and convergence in finding the GMPP compared to the previous algorithms. The ripple in MFA in steady-state conditions is lower than P&O, PSO, and FA methods.

Introduction

UPQC is a custom power device (CPD) utilized for eliminating the PQ problems such as harmonics [1] unbalance, sag and swell and phase-angle jump due to the extensive usage of electronically switched devices and non-linear load [2,3]. This CPD comprises of both shunt and series converters coupled through a common DClink voltage and deals with harmonics in load current and also imperfections in source voltage [4]. The shunt converter can eliminate current harmonics and unbalances from the nonlinear load so that perfect sinusoidal current flows through the power network, however series converter can compensate voltage sag/swell, voltage unbalance, voltage distortion and phase-angle jump present on the source side, so that perfect voltage regulation is maintained across the load [5]. Therefore, UPQC draws the consideration of power engineers to create active and adaptable solutions to PQ issues, which leads to the development of novel topologies and advanced control systems for UPQC. Control system plays an important part in the overall performance of a

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Novel soft-switching integrated various converter of ZVT-ZCT grid connected PV system

Nisha C. Rani [a] ✉, N. Amuthan [b] ✉

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Abstract

Solar photovoltaic systems contribute to the development of the world's most environmentally sustainable and cost-effective electrical energy. High-power inverters commonly use a technique known as three-level design to increase their performance by soft-switching. On the other hand, the switching action is stressed in normal operation because the current or voltage will not be zero at the time of the transition. For CUK, SEPIC, ZETA and CASCODE converters operating in critical switch mode, it has been proposed that a new type of DC-DC converters primarily formed on capacitive coupling DC-DC converters be developed. The proposed converters are zero-current-voltage-switching half-square-quarter-wave converters with a zero-current auxiliary circuit. LC-circuit resonance causes power switches to turn on at zero voltage, getting rid of the switching losses during turn on. The hybrid Incremental Conductance & Integral Regulator technique is used to track MPP available from PV system. The proposed converter's results and efficiency are compared to those of traditional semi-square-quarter-wave zero-current-converter converters. The proposed converters achieved power efficiencies of 98.7% in the step-up mode and 98.8% in the step-down mode for the rated load state, respectively. The proposed CUK, SEPIC, ZETA and CASCODE Converters Simulation are implemented in the MATLAB Simulink programme to validate its efficiency.

Introduction

Soft-switching approaches that offer Zero Current Transition (ZCT), Zero Voltage Transition (ZVT) or a combination of the two have been proposed to improve power conversion efficiency. A photovoltaic system is a power system that utilizes photovoltaic technology to generate usable solar energy. The suggested soft-switched DC-DC converter is compared to a normal DC-DC converter in terms of efficiency and a few topologies at different output powers.

Gurumurthy et al. [3] describes a new BDC (Bi-Directional Converter) design that uses a mix of quick turn off IGBTs and the implementation of a new control logic to attain switching losses to be zero utilising ZVT and ZCT approaches. The proposed topology has a drawback in that the optimum resonant component

Original Article

Soft-Switching Integrated Quasi Resonance Buck-Boost Converter for HHO Optimized Grid Connected PV System

Nisha C. Rani[1], N Amuthan[2]

[1]Department of Electrical and Electronics Engineering, The Oxford College of Engineering, Bangalore, India.
[2]Department of Electrical and Electronics Engineering, AMC Engineering College, Bangalore, India.

[1]nishashamin@gmail.com

Abstract – *The most economical and ecologically beneficial electrical energy worldwide results from solar photovoltaic systems. However, switching action under normal operation undergoes stress since the voltage or current may not be zero at the changeover time. Here, we suggested the ZVT-ZCT Quasi Resonance Buck-Boost converter (QRBB), which introduces L-C dynamics and induces a forced oscillation, allowing the primary switch (IGBT) to turn off at zero current transition and turn on at zero voltage transition, thereby reducing stress on switching device. Furthermore, the VSI is controlled by the Harris Hawks Optimization Algorithm (HHO) optimized proportional-integral (PI) controller. The proposed dc-dc converter can deliver pure sinusoidal output current and voltage waveforms with better output voltage enhancement. The suggested QRBB Converter's performance and efficiency are tested through simulation using the Matlab Simulink software. The result shows that the PI-HHO controller provides a better steady and dynamic state response and delivers quality power to the grid than the conventional PI controller.*

Keywords – *Global Warming, Solar Photovoltaic Systems, Electrical Energy, Output Voltage, Matlab.*

1. Introduction

Concerns about global warming, the exhaustion of fossil fuels, and technological advancements have made non-conventional energy resources appear as reliable energy sources. Incorporating solar systems into grid-connected systems has increased their significance in today's energy market [7, 15]. The electric power generated from SPV is DC. When we connect SPV to constant frequency grid systems, it takes two stages to complete the energy conversion process ice, DC-DC, and DC-AC conversions are both possible [1]. The energy conversion process for renewable energy systems involves DC-DC buck-boost converters and DC-AC Voltage Source Inverters.

SMPS have become lighter and smaller in the case of a higher switching frequency conversion system. [20] When the switch is a turn on, the current flow will be increased, and the voltage will be decreased across the switch. Now, if there is an overlap between these two transients, this phenomenon is termed hard switching, resulting in switching losses [24]. However, if the switching voltage becomes zero, then the current starts rising. There is theoretically zero turn-on loss. These kinds of switching are known as 'soft switching'. When we implement resonant components in parallel/series with the switches, the converter can attain zero voltage/current switching for the

diode and switch without increasing current and voltage stress. These types of converters are called ZVT/ZCT converters [15]. QSW-ZCS [3] lowers the switch's voltage stress, enables the designer to choose semiconductor devices with a lower voltage rating for the output switch, and eliminates the need for passive RC snubbers, reducing the value of dv/dt, which brings about EMI improvement. [4] The employed ZVT cell in this converter is compatible with high step-up coupled inductor-based boost converters since soft switching is provided by making use of the leakage inductance of coupled inductors in the resonant network. [5] A non-isolated buck converter, resonance and zero voltage transition to achieve zero voltage switching (ZVS) and zero current switching (ZCS) to upgrade the conversion efficiency. [6] SEPIC converter is designed for continuous input current operation.

These auxiliary circuits do, however, work with resonance, which increases the cost and complexity of the circuit. Thus, the soft switching converts reduce the system's efficiency as the auxiliary switches generate the switching losses [8, 9, 13, 17]. As mentioned in [10], the limitations of hard switching in Continuous Conduction Mode are the switching loss due to reverse recovery voltage and higher switching frequency [11]. Despite these limitations, the hard switching methodology has to be modified to reduce or

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The seven-level flowing, dynamic, unbiased, point-cinched converter of the half-breed. The converter geography is made up of an H-span for each stage and a three-level Active Neural Point Clamped (ANPC) converter. Through the selection of the converter's exchanging circumstances, the voltage of the H-span is ferociously maintained with fundamental force. With extensive geographic reenactment effects, working ethics, voltage regulating techniques, and converter restrictions are jointly studied. By directing the exchanging obligation patterns of 2 PWM signals, which veer the activity event of excess exchanging states in each exchanging cycle, the voltage slantingly the flying capacitor is also synchronised. There are recreation and trial grades available to demonstrate the effectiveness of this tactic. a method for altering the voltage of capacitors, including flying and dc-interface capacitors, for the 7 level ANPC (7L-ANPC) converters. 7L-ANPC converters are worked at major repetition rates whereas various switches are worked with a constant exchanging repetition rate. to test the connection among the zero grouping voltage and the typical impartial point current. The impartial point potential is meant to be controlled by an ideal zero-arrangement voltage. Altering the trading responsibility cycles also synchronises the voltage across the flying capacitor. Every time a recurrent swapping state occurs throughout an exchange period, it is altered. It is possible to test the validity of this tactic using simulation and exploratory data.

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Chapter

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Aryan Chaudhary
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ABSTRACT ⌄

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The development of laboratory downscale rail-wheel test rig model with optical sensors

Preeta Sharan [a], Suchandana Mishra [a] 👤 ✉ , Anup M. Upadhyaya [b]

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Abstract

Railway and train condition monitoring are two critical components in assuring passenger safety and comfort during their journey. In this work, a new laboratory downscale rail test rig has been designed and developed for exploring rail-wheel interaction and axle peak detection using fiber Bragg grating (FBG) optical sensors. This paper describes the laboratory setup's development process which includes numerical analysis of rail model, review of different experimental techniques, followed by 1:3 scaled model, mechanical and functional analysis of the railway setup with the grating sensor. By employing various data processing techniques axle peak detection of train was done and strain/stress transfer was calculated by the train passage to the rail track which was ~100.86 $\mu\varepsilon$. Total wavelength shit in the FBG sensor was 0.133 nm due to wheel load and sensitivity value was calculated approximately 1.36 pm/$\mu\varepsilon$ for the wavelength/strain changes. Characteristics of 1:3 laboratory rail test rig such as track retention, number of wheels, axle peak detection, rail-wheel rolling contact, stress/strain track deformation can be obtained in real time with fiber Bragg grating sensors.

Introduction

Railways and high-speed trains offer excellent energy conservation, environmental protection, economic growth, and effective travel time, among all others mode of transportation. It plays an important role for both passengers and goods [1]. Therefore, railway is developing in a continuous manner with respect to safety and convenience when compared to the road systems. In day-to-day studies more focus and research are required to minimize the rail defects and to monitor rail parts and railway system. The whole railway monitoring system comprises of various techniques and methods by using different tool. The experimental study conducted in various field examines the mechanics of wheel and rail which provides maximum information about the rail track and different parts of rail vehicle like weight of wagon, speed of the train, wear and tear in wheel condition [2]. Many studies have focused on traffic in railways, minimizing the waiting time for passengers, scheduling of trains to correct track to avoid accidents [3]. Another technique

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Research | Published: 13 April 2023

Design of Two-Dimensional Photonic Crystal Defect Microcavity Sensor for Biosensing Application

Preeta Sharan ✉, Tahani A. Alrebdi, Abdullah Alodhayb &
Anup M. Upadhyaya

Abstract

In the proposed work we designed and analysed a two-dimensional photonic crystal based sensor for three different biosensing applications, including measuring the normal and abnormal levels of uric acid, glucose, and creatinine in the blood. We examine the sensitivity, Q factor, and wavelength shift of two different types of sensor cavity design. The simulation approach used a finite difference time domain method. The work has made use of electromagnetic equation propagation, MEEP tool from the Massachusetts Institute of Technology. The maximum sensitivity of the proposed sensor is

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Research Article

High temperature erosion performance of NiCrAlY/Cr₂O₃/YSZ plasma spray coatings

G. M. S. Reddy, C. D. Prasad ✉ iD , P. Patil, G. Shetty, N. Kakur & M. R. Ramesh

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ABSTRACT

The current investigation's objective was to assess the air jet erosion tester's ability to measure the erosive behaviour of plasma sprayed coatings on titanium-15 alloy. 65% NiCrAlY, 30% Cr₂O₃, and 5% YSZ make up the coating's chemical composition. A study of microstructure and phases was carried out. Microhardness and adhesive strength have both been measured in this work. With impact angles of 30° and 90° at 300°C, 500°C, and 700°C, Al₂O₃ erodent was utilised in a solid particle erosion test. An optical profilometer was used to calculate the erosion volume loss. The

coating erosion resistance was found to be higher than the substrate sample for the test temperature that was employed, and this was more obvious at higher impact

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Investigation of High-Temperature Erosion Behavior of NiCrAlY/TiO$_2$ Plasma Coatings on Titanium Substrate

G. Madhu Sudana Reddy, C. Durga Prasad ✉, Shanthala Kollur, Avinash Lakshmikanthan, R. Suresh Kumar & C. R. Aprameya

Abstract

The current study examines the erosive behaviour of a 65% NiCrAlY + 35% TiO$_2$ plasma-sprayed coating on titanium-15 substrate at various temperatures. X-ray diffraction and scanning electron microscopy were used to characterize the coating. We assessed the coating's porosity, microhardness, surface abrasiveness, and adhesive power. At impact angles of 30° and 90°, solid particle erosion studies were conducted at various

Special Issue

Advanced Functional Graded Materials: Processing and Applications

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Effects of Polypropylene Waste Addition as Coarse Aggregates in Concrete: Experimental Characterization and Statistical Analysis

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D. C. Naveen,[1] **K. Naresh** ✉ iD ,[2] B. S. Keerthi Gowda iD ,[3] Madhu Sudana Reddy G iD ,[4] C. Durga Prasad iD ,[5] and Ragavanantham Shanmugam iD [6]

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Academic Editor: Qian Chen

Abstract

In recent times, thermoplastic waste materials are being extensively used as fine and coarse aggregates in the concrete mix as an environmentally friendly construction material. This study aims at utilizing polypropylene (PP) as a partial substitute for the conventional coarse aggregates in M30 grade concrete. The different replacement levels of coarse aggregates such as 0%, 20%, 40%, and 60% by weight were used in concrete. Sieve analysis, specific gravity, and water absorption tests were performed in all replacement levels of aggregates. The mechanical (compressive and split tensile tests) tests were conducted after 3, 14, and 28 days. The change in mechanical properties of concrete with the addition of different weight proportions of plastics was studied experimentally. Further, experimental values were predicted using the two-parameter Weibull distribution and artificial neural network (ANN)-based statistical approaches. The Levenberg–Marquardt algorithm was used in predicting the mechanical properties using the ANN. A good correlation was obtained between the experimental and predicted values with an error (%) of less than 10. The decrease in mechanical properties with the increase in replacement levels of coarse aggregates in concrete was observed in both experimental and predicted

Engineering Research Express

PAPER

Investigation of thermally sprayed NiCrAlY/TiO$_2$ and NiCrAlY/Cr$_2$O$_3$/YSZ cermet composite coatings on titanium alloys

G Madhu Sudana Reddy[1], C Durga Prasad[2],* , Pradeep Patil[3], Gagan Shetty[4], M R Ramesh[5] and T Nageswara Rao[3]

1   Department of Mechanical Engineering, The Oxford College of Engineering, Bengaluru, Karnataka, India
2   Department of Mechanical Engineering, RV Institute of Technology and Management Bengaluru, Karnataka, 560078, India
3   Department of Mechanical Engineering, GITAM University, Bengaluru, Karnataka, India
4   Department of Mechanical Engineering, Sahyadri College of Engineering & Management, Adyar, Mangaluru 575007, India
5   Department of Mechanical Engineering, National Institute of Technology Karnataka, Surathkal 575025, India
*   Author to whom any correspondence should be addressed,

E-mail: durgaprasi71@gmail.com

Abstract

The present work investigates the hot corrosion behavior of thermally sprayed 65 pct NiCrAlY $+$ 35 pct TiO$_2$ and 65 pct NiCrAlY $+$ 30 pct Cr$_2$O$_3$ $+$ 5 pct YSZ coatings on titanium 15 alloys. The coatings on the titanium 15 alloy substrates exhibit a near-uniform, dense, and adherent microstructure with a porosity of 2.7 to 2.9%. Thermogravimetric studies are made to examine the hot corrosion performance of coatings in a molten salt environment of Na$_2$SO$_4$ $+$ 60%V$_2$O$_5$ at the temperature of 700 $^\circ$C for 50 cycles. One cycle is carried out by heating for a period of one hour and cooling the sample at ambient conditions. The corrosion products are analyzed based on scanning electron microscopy, energy dispersive analysis, and X-ray diffraction techniques to study the morphology, phase composition, and abundance of the high-temperature corrosion constituents. The bare titanium-15 alloy, 65 pct NiCrAlY $+$ 35 pct TiO$_2$ coating and 65 pct NiCrAlY $+$ 35 pct Cr$_2$O$_3$ $+$ 5 pct YSZ coating produced a weight gain of 307.92 mg cm^{-2}, 42.16 mg cm^{-2} and 44.02 mg cm^{-2} respectively after the period of 50 cycles. The effective resistance of the coatings is due to the formation of Ni$_3$V$_2$O$_8$, NiCr$_2$O$_4$, Cr$_2$O$_3$ & AlV$_2$O$_4$ phases.

1. Introduction

Hot corrosion is a major drawback that can be seen in gas turbines, boilers, IC engines, incinerators, etc [1]. The vanadium, sulphur, and sodium are the common impurities that are present in some low-grade petroleum fuels, when coming in contact with high-temperature materials, providing a harsh environment for the hot corrosion to occur [2–4]. Hot corrosion is initiated by deposition or condensation of corrosive species, e.g. sulphates. The condensation of sulphates on gas turbine blades takes place owing to high concentrations of alkalis in combination with high concentrations of sulphur [5–7]. Even at high concentrations of chlorine, alkali sulphates are formed, because these are the least volatile alkali species. The typical temperature range for hot corrosion in gas turbines is 600 $^\circ$C–950 $^\circ$C [8–10]. The upper-temperature limit is given by the dew point of the alkali sulphates. The lower temperature limit is given by the melting point of eutectics formed by the deposits and the corrosion product scale of the blade material [10–12].

Hot corrosion has been characterized as type I (high-temperature) corrosion and type II (low-temperature) corrosion. Type I hot corrosion mainly occurs at 800 $^\circ$C–950 $^\circ$C. It is caused by the formation of liquid alkali sulphates above their melting points, leading to the basic dissolution of the oxide scale of the blade material. Type II hot corrosion mainly occurs at 600 $^\circ$C–800 $^\circ$C. It is caused by the formation of a eutectic melt of NiSO$_4$ or CoSO$_4$ and alkali sulphates above the eutectic temperature. NiSO$_4$ and CoSO$_4$ are formed by the reaction of the oxide scale of the blade materials with SO$_3$ depending on the SO$_3$ partial pressure in the hot flue gas [4, 5,

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Technical Paper | Published: 21 August 2022

Processing and Characterization of Cu−10Sn/ZrO₂ Alloys Processed Via Stir Casting Technique: Mechanical Properties and Wear Behavior Studies

Prasad H. Nayak, M. Ravi Prakash, V. Vinay, H. K. Srinivas &
M. J. Shivaram ✉

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Abstract

In this study, various amounts of nano-zirconia
(ZrO_2) were added as a reinforcement particle to
synthesize Cu−10Sn−xZrO$_2$ alloy using stir casting
techniques. The mechanical and wear properties of
metal matrix composites depend on the type of
reinforcement material, morphological features and
amount of the reinforcement material is added to
matrix. The developed alloy obtained hardness
ranging from 69 to 87 BHN for the addition of 0 to
12 wt% of nano-ZrO_2 reinforcement particles. The
ultimate tensile strength of developed alloys
increased ranging from 271 MPa to 345 MPa, while

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Research Article | Published: 06 January 2023

Implementation of digital differentiator and digital integrator using quantum dot cellular automata

Preeta Sharan ✉, Anup M. Upadhyaya & Manpreet Singh Manna

Abstract

Current CMOS (Complementary metal–oxide–semiconductor) technology is no longer constrained in scaling by short channel effects. The semiconductor industry has developed a number of substitute technologies, including quantum-dot cellular automata, to get around these restrictions (QCA). In this study, a novel technique for developing digital differentiators and integrators is presented, employing QCA Technology as a key component. In order to design the digital differentiator focus has been given on no recursive simple tapped delay line differentiator called first

APPLICATION OF ADVANCED THERMODYNAMIC METHODS FOR OPTIMIZING THERMAL SYSTEMS

Shailandra Kumar Prasad[1], Dr Nabeel Kadhim Abbood[2], Dr.Silpi Chatterjee[3], Nitin J Jadhav [4], Dr. Varun K R[5], Dr.G. Nagaraj[6], Jagadeesha T[7]

[1]Assistant Professor, Department of Mechanical Engineering, R V S College of Engineering and Technology, Edalbera, Bhilai Pahari, NH -33, Jamshedpur 831012, Jharkhand, India
shailandrap39@rvscollege.ac.in

[2]Basrah University for Oil and Gas, Iraq. nabeel.abbood@buog.edu.iq

[3]Assistant professor, Department of Public health dentistry, Dr.D.Y. Patil dental college & hospital, Pune, Dr D.Y.Patil Vidyapeeth,Pune

[4]Assistant Professor, Department of Mechanical Enforcement, JSPM's RSCOE Thathwade

[5]Asst. Professor, Department of Mechanical Engineering, The Oxford College of Engineering, Bommanahalli, Bangalore-68

[6]Associate Professor, Department of Mechanical Engineering, Sethu Institute of Technology, Email:nagarajsasi@gmail.com

[7] Associate Professor, Mechanical Engineering Department, National Insitute of Technology, Calicut, 673601, Kerala State, Email:jagdishsg@gmail.com

Abstract

This study serves as an example of an effort to raise the effectiveness of a shell-and-tube heat exchanger. A device that transfers heat from a single fluid into another is one definition of a heat exchanger. Heat exchangers come in a variety of forms, but those with shells and tubes are some of the most adaptable and widely utilised. This project optimises the structural and CFD components while also taking the entire yearly operating cost into account. As a result, research has been done to establish the ideal heat exchanger size in relation to a certain set of input characteristics and the required outputs at the outlet. Three phases of optimisation were used for the heat exchanger: (1) a mathematical model-based thermal study; (2) ANSYS nozzle optimisation with structural loads; and (3) ANSYS CFD analysis. Every technique made use of the ANSYS software. Due to the fact that each of the the necessary variables have been obtained from recognised standards and guidelines in the industry, the optimisation issue has now taken on a more realistic form.

Keywords:shell-and-tube heat exchanger,CFD elements,ANSYS nozzle optimization.

Introduction

The typical heat exchanger is an example of what is known as an indirect form of recuperative heat exchanger [4]. This type of heat exchanger involves the cold stream recovering heat from the hot stream via the use of a dividing wall. It is referred to as a direct contact type heat exchanger when

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Special Issue

Federated Learning for Sustainable Power Management in Smart Grid Networks

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Renewable Energy Based Smart Grid Construction Using Hybrid Design in Control System with Enhancing of Energy Efficiency of Electronic Converters for Power Electronic in Electric Vehicles

Suhasini Sodagudi,[1] C Manjula,[2] M. S. Vinmathi,[3] R. Shekhar,[4] José Luis Arias Gonzáles,[5] C. Ramesh Kumar,[6] Gaurav Dhiman (iD),[7,8,9] and **A. R. Murali Dharan** ✉ (iD) [1,10]

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Published: 04 Oct 2022

Abstract

The power electronic interface is critical in matching a distributed generation (DG) unit's characteristics to grid requirements as most DG technologies rely on renewable energy. Increased adoption of electric vehicles (EV) is seen as a positive step toward minimizing air pollution as well as carbon emissions. Rapid proliferation of electric vehicles as well as charging stations has exacerbated voltage quality as well as harmonic distortion difficulties, which harm the efficiency of combined renewable energy. This research proposes novel hybrid design techniques in control systems that enhance the energy efficiency of electronic converters for power electronics. The control system enhancement has been carried out using a hybrid energy storage electric convertor, and energy efficiency is improved using a synergetic battery reference adaptive controller. A plug-in hybrid electric vehicle (PHEV)'s internal combustion engine with a small photovoltaic (PV) module is utilised to assess a proposed control method which effectively regulates electric power on-grid by draining electricity from batteries during peak hours as well as then

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A HYBRID APPROACH FOR OPTIMIZED VIDEO COMPRESSION USING DEEP RECURRENT AUTO ENCODERS (DRAE) TECHNIQUE

Mr. KOMMERLA SIVA KUMAR [1], Dr. P. BINDHU MADHAVI [2], Dr.K. JANAKI [3]

[1] Assistant Professor, CSE Department, R.V.R & J.C College of Engineering,
Andhra Pradesh.
[2] Professor & HOD, Department of AI & ML, The Oxford College of Engineering,
Karnataka.
[3] Associate Professor, Department of CSE-AI, Faculty of Engineering,
Jain Deemed to be University, Karnataka.

kommerlasivakumar@gmail.com. bindhu.prathipati@gmail.com. karur.janaki@gmail.com

ABSTRACT

Presently, the data traffic is increasing for video conferencing, online education, gaming and watching videos on Netflix, Amazon Prime, YouTube and other OTT platforms. And, the service users are always demanding high definition and high-quality video facilities day by day. However, in order to transmit video data across the Internet's constrained bandwidth effectively, video compression is a necessary task. In last few decades, various video compression algorithms, such as non-learning and learning were standardized. But still some improvements are needed for effective video related services. We propose a deep learning based Deep Recurrent Auto Encoders (DRAE) approach which contain various modules for implementing an efficient video compression technique. The experimental outcome shows our model achieves state-of-the-art learned video compression performance in terms of both PSNR and MS-SSIM.

Keywords: Video, Compression, Deep Neural Networks, Recurrent Auto Encoders.

1. INTRODUCTION

Nowadays, video content contributes to more than 80% internet traffic, and the percentage is expected to increase even further. Therefore, it is critical to build an efficient video compression system and generate higher quality frames at given bandwidth budget.

Modern digital video looks as impressive as it does is because of the sheer amount of information digital cameras can capture. This informational data is what creates the crisp details and vivid saturation of modern video. The problem is that it takes a ton of data to capture these beautiful videos. So much data that you may find your computers and hard drives filling up quickly due to the hefty storage demands of your video, not to mention the extremely long wait times for uploading or sharing these videos to online platforms. Luckily, compression offers the solution of taking the vast amounts of data that cameras generate and interpreting it in a way

that is more efficient, creating new files that are only a fraction of the file size! The only way you'll be able to share, upload, stream and store all of your great video content with any regularity is by compressing it. The trick is to know "good" compression from "bad" compression. The objective of "good" compression is to minimize the file size as much as possible with the least amount of image quality reduction by removing things like redundant or non-functional data from your video file.

Internet traffic has recently been dominated by video-related applications including video on demand (VOD), live streaming, and ultra-low latency real-time communications.

Due to the ever-increasing demands for resolution ([1] and [2]), and fidelity, more effective video compression is required for content transmission and storage, and therefore for successful implementation of networked video services ([3], [4]). Video compression systems develop suitable techniques to reduce

Original Research Paper

An Efficient Video Compression Framework using Deep Convolutional Neural Networks (DCNN)

[1]Kommerla Siva Kumar, [2]P. Bindhu Madhavi and [3]K. Janaki

[1]*Department of Computer Science and Engineering, R.V.R and J.C College of Engineering, Andhra Pradesh, India*
[2]*Department of AI and ML, The Oxford College of Engineering, Karnataka, India*
[3]*Department of Computer Science and Engineering-AI, Faculty of Engineering, Jain Deemed to be University, Karnataka, India*

Corresponding Author:
Kommerla Siva Kumar
Department of Computer
Science and Engineering,
R.V.R and J.C College of
Engineering, Andhra Pradesh,
India
Email: kommerlasivakumar@gmail.com

Abstract: In the current world, video streaming has grown in popularity and now accounts for a large percentage of internet traffic, making it challenging for service providers to broadcast videos at high rates while utilizing less storage space. To follow inefficient analytical coding design, previous video compression prototypes require non-learning-based designs. As a result, we propose a DCNN technique that integrates OFE-Net, MVE-Net, MVD-Net, MC-Net, RE-Net, and RD-Net for getting an ideal collection of frames by linking each frame pixel with preceding and following frames, then finding linked blocks and minimizing un needed pixels. In terms of MS-SIM and PSNR, the proposed DCNN approach produces good video quality at low bit rates.

Keywords: Deep Neural Networks, Encoding, Decoding, Video Compression

Introduction

People who watch videos on the internet are about 90%, this is expected to rise in the near future. As a result, an effective video compression model is required to deliver higher-quality frames while using less bandwidth.

Video codecs compress videos using hand-drawn models. Despite their superb design, the present models are poorly optimized. The video compression process can be improved even more by tweaking the entire codec model.

Deep neural networks have outperformed classic picture codecs like the Joint Photographic Experts Group in video compression. Deep neural network-based models that rely on extremely nonlinear transformations require end-to-end training.

It's not easy to create a model that uses a variety of video compression algorithms. Motion estimation, which creates and compresses motion data, is the most important part. To remove temporal redundancy, video compression significantly relies on motion information. The only way to express motion vectors is to use an optical flow net. Although learning-based optical flow estimation focuses on obtaining exact flow data, proper optical flow isn't always the best solution for specific video applications. Furthermore, the ability of optical flow data is greater than that of existing models, resulting in high bit rate information when optical flow values are directly compressed using existing methods.

Reduced rate-distortion aims to provide higher-quality reconstructed frames at the same bit rate. It is essential for proper video compression to technique.

Rate distortion must be decreased to achieve the benefits of end-to-end training for deep learning-based video compression models. The following are the model's key benefits: All steps of the DCNN model are implemented using deep neural networks. The DCNN model is based on rate-distortion and uses a single loss function to combine all of the steps, resulting in a high compression ratio. This study will aid researchers working on computer vision, video compression, and deep model creation.

Related Work

Kumar and Janaki (2020), the video compression task can be categorized into three types. They are the classical era, the era of generic heuristics, and the era of modern techniques with deep learning. Through the detailed study of the literature through the past decades, it is learned that various schemes have been proposed for video compression. These schemes have contributed a lot of efficient mechanisms in different ways. However, further improvements are also needed towards the same pertaining to the limitations observed as specified.

Birman *et al*. (2020), illustrate and explain various issues for the video compressionprocess in the field of DNNs. ,Still

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Real - Time Applications of Video Compression in the Field of Medical Environments

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Siva Kumar Kommerla ; Bindhu Madhavi Prathipati ; K. Janaki ; R. CH. A. Naidu   **All Authors** •••

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Abstract:
We introduce DCNN and DRAE appraoches for compression of medical videos, to decrease file size and storage requirements, there is an increasing need for medical video compression nowadays. Using a lossy compression technique, a higher compression ratio can be attained, but information will be lost, and possible diagnostic mistakes may follow. The requirement to store medical video in lossless format results from this. The aim of utilizing a lossless compression tool is to maximize compression because the traditional lossless compression technique yields a poor compression ratio. The temporal and spatial redundancy seen in video sequences can be successfully utilized by the proposed DCNN and DRAE encoding. This paper describes the lossless encoding mode and shows how a better compression ratio can be achieved.

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I. Introduction

Special Issue

Security Threats and Challenges in Future Mobile Communication Systems

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FCN Network-Based Weed and Crop Segmentation for IoT-Aided Agriculture Applications

Shoaib Kamal ✉ (iD),[1] Vaishali Gajendra Shende,[2] Korla Swaroopa,[3] P. Bindhu Madhavi,[4] Patan Saleem Akram,[5] Kumud Pant,[6] Shantala Devi Patil,[7] and **Kibebe Sahile** ✉ (iD)[8]

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Academic Editor: Deepak Kumar Jain

Published: 12 May 2022

Abstract

The main purpose of the work is to evaluate the deep machine learning algorithms used for the distinction between weeds and crop plants using the open database of images of the carrot garden. Precision farming methods are highly prevalent in the agricultural environment and can embed intelligent methods in drones and ground vehicles for real-time operation. In this work, the accuracy of the weed and crop segment is analyzed using two different frameworks of deep learning for the semantic segment: the fully convolutional network and the ResNet. An open database with images of 40 plants and weeds was used for the case study. The results show a global accuracy of more than 90% in the verification package for both structures. In the second experiment, new FCN networks were trained to evaluate the impact of these processes on different image preprocessing and separation performance by different training/testing rates of the dataset.

1. Introduction

ANALYSIS AND DESIGN OF MULTI-STOREY BUILDING USING ETABS

[1]GAYATHRI R, [2]HARSHITHA, [3]DR.T S MALLESHIAH

[1]Asst Professor, [2]Student, [3]Professor

[1,2,3]Department of civil Engineering,

[1,2,3]The Oxford College of Engineering, Bangalore, Karnataka, India

_____

Abstract: A multi-storey building has several floors at different levels above the ground. Analysis and design of multi-storied building deals with economic factor, serviceability and durability of a building. The foremost basic in structural engineering is the design of simple basic components and members of the building i.e., beams, columns, slabs and footings.Thisproject work aims to analysis and design of a four storied building using ETABS.

ETABS stands for Extended Three-Dimensional Analysis of Building Systems. It is a stand-alone structural analysis programme with a special purpose features for structural design and analysis of building systems. It is simple to use and user friendly and it is unique in its ability to address the full spectrum of tasks involved in the process of structural analysis and design. The main purpose of this software is to design multi-storey building in a systematic process. This project accomplishes a typical design project which is designed as per Indian Codes IS1893-Part 2:2000 and IS456:2000. The design involves determining the most suitable proportions of a structure and dimensioning and detailing the structural elements. Once the structure is analysed and designed it must have sufficient strength to withstand the maximum stresses to which it is subjected. This paper discuss the analysis of a conventional building (G+4) under the effect of shear forces and bending moment of beams and columns.

Keywords: ETABS, analysis, structural design, shear force, bending moment

_____

1. Introduction

This Project is based on the analysis and design of a four storied building. The determination of general shape, specific dimension and size of a building is known as structure analysis, so that it will perform the function for it and will safely withstand the influences which will act on throughout its useful life. In short, the specification of the required structure is the most important thing to decide many aspects of the structure, such as functional safety and economic aspects. The entire process of structural planning and designing requires not only imagination and calculations, but also science knowledge of Structural Engineer.In this Project, an effort made on planning, analysis and design of residential building using E-TABS. We have taken a plan of a building on the basis of which the analysis will be done for the whole structure. For the analysis of a building one has to consider all the possible loadings and see that the structure is safe against all possible loading conditions. The dead load and live loads are calculated and applied and the design for beams, columns, footing and slabs are obtained. Analysis of beams and columns has been done using E-TABS software.

2.Significance of The Study

Analysis of a building means the estimation of the response of structures towards variable external loads considering all the deviants that may occur. During the preliminary design-stage the estimated external load is used to design the size and geometry of the structures of interconnected members by using local building code and specifications of the area where the structure is located. Therefore, assuring the structural integrity, durability etc. Neglecting this crucial analysis and design stage or erring during the process will result in catastrophic failure within the building structure which can, in the worst-case scenario may lead to the loss of lives. Since this stage is the most important, the margin of error is required to be close to zero. We are making use of a software called ETABS, which is a highly efficient structural analysis and design programme consisting of modelling tools, code-based load prescriptions, analysis methods and solution techniques. Through this study we want to signify the importance of analysing and design of a multi - storey building to ensure that it satisfies the safety and serviceability requirements with help of the software ETABS.

3.Review Of Related Studies

Balaji.U and Selvarasan (2016) used ETABS to analyse and design a multi-storeyed building which was under static and dynamic loading. In the study a G+13 storey residential building was studies for earthquake loads using ETABS. Here they assumed that the material property to be linear, static and dynamic analysis were performed. The non-linear analysis was performed by considering severe seismic zones and the behaviour

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A Comparative Study of Framed Structure, Frame Tube and Tube In Tube Structures Subjected To Lateral Load Under Zone Iii And Zone V

Priyanka[1], Shivanand C.G[2], Dr. P. Prakash[3], Geetha L[4]

[1] *MTECH. In Structural Engineering, Department of Civil Engineering, The Oxford College of Engineering Bangalore- 56006, India.*
[2]*Assistant professor, Department of Civil Engineering, The Oxford College of Engineering Bangalore- 560068, India.*
Professor, Department of Construction Technology and Management, DSCE, Bangalore- 560068, India.
Assistant professor, Department of Construction Technology and Management, DSCE, Bangalore- 560068, India.

Abstract - *This study aims to understand the effect of the earthquake on framed structure, frame tube and tube in tube structures. The main objective of the study is to understand the behavior of structure with respect to story drift, story shear and story displacement. The G+39 and G+29 storied Structure are acquired for dynamic analysis. Method adopted was Response spectrum method. For the purposes of analysis software used is ETAB'S. After analysis the results are compared between framed structure, frame tube and tube in tube structures. The comparative study of frame tube structure, tube in tube structure, framed structure under Zone III and Zone V and is to be done to find most efficient structure in order to resist the lateral loads of the combined system.*
Key Word: Framed structure, Frame tube, Tube in tube, ETABS.

I. INTRODUCTION

Development of the country can be accomplished through proper planning and economic development as they are the vital reasons that encourage technological progress by dogging the use of the latest materials and technological systems. The main concept of tubular structures is to design the tall structure as a vacant cantilever vertical to the surface of ground which can resist the lateral loads. These structures consist of ring of columns at the edge of the structure are closely spaced columns and these columns are connected to each other by deep spandrel beams through moment connections. In this tube at the exterior of the building a very stiff moment resisting frame i.e. a tube is formed which provides the lateral resistance to the building or structures. The tubular structures of much type have been developed to resist the lateral loads.
• **Frame tube**
• **Tube in tube**

1.1 Framed Tube

In this tube at the exterior of the building a very stiff moment resisting frame i.e. a tube is formed which provides the lateral resistance to the building or structures. This exterior framed tube consists of closely spaced columns at a distance of 6-12 ft between centers; these columns are connected to each other by deep spandrel beams. The peripheral framed tube and core columns or walls resist gravity or vertically downward loads while the lateral loads acts, at the face of the framed tube formed by closely set apart columns which acts as the webs, when aligned along the loading direction, and act as the flanges when the loading direction is normal to the tube surface .

Construction Sequence Analysis of G+30 RCC, Steel Residential Building with Floating Column

Mr. T.S.Prashanth Hathwar[1], Mr. Rizwanuddin[2]

[1]Assistant Professor, Civil Engineering, The Oxford College of Engineering, Bangalore.

[2]Student, M.Tech, Structural Engineering, The Oxford college of Engineering, Bangalore.

Abstract- While examining a multistory building frame using FEM based software mostly a complete model is made then the model is applied with loads at once, but this is not the case in real structures, the actual load comes on the structure in steps, as the construction progresses stages by stages. So, to overcome the above issues construction sequence analysis came in to existence, which is a non-linear static analysis method that analysis the structure in step wise by creating an auto construction load case in FEM based software. The current exploration conducted on a G+30 residential structure having vertical irregularity which is analyzed by methods namely construction sequence analysis for dead load case and conventional Equivalent static analysis along with dynamic response spectrum analysis all this is achieved in CSI ETABS 2016 software. The structure is RC and steel frame type consisting of floating column and resides in zone 4 and zone 2 as per Indian standard code IS: 1893-2016. Results such as bending moment, shear force, column axial force, story drift, displacement are abstracted from the analyze results which are collated with CSA, ESA and considering load combination to compare the results with RSA.

Key words- Construction Sequence Analysis, Equivalent Static Analysis, Floating Column, ETABS, response spectrum analysis.

1. INTRODUCTION

The frame structure is mostly fails during construction stage. Some of the failure involve such as components failure, joints failure, incomplete member failure, under strength reinforced concrete member failure. Some failures are mostly happened due to poor stability that may be frame and often may be due to unstable soil strata. This failure during construction process will be uneconomical to the construction cost and may cause injuries and loss of life may happen

In analysis of a frame there are number of facts that has a key role for the accuracy of analysis some of them are listed below

1. The load from construction process due to stage-by-stage construction
2. The impact of column shortening due to creep and shrinkage
3. Time-dependent properties impact of material such as shrinkage
4. The effect due to irregularity of frame structure
5. Proper distribution of stress and displacements coming from upper storeys

The definition of construction sequence analysis (CSA) is that in case of analyzing a structure using FEM based software mostly a complete model is made then the model is applied with loads at once, but this is not the case in real structures, the actual load comes on the structure in steps, as the construction progresses stages by stages. So, to overcome the above issues construction sequence analysis came in to existence, which is a non-linear static analyzing method that analyses the structure in step wise by creating an auto construction load case in FEM base software.

Construction sequence analysis is applied to all type of structures which are construct in stages, the major use of construction sequence analysis is in a structure where floating column are present. Since a conventional equivalent linear static

Analysis neglects the effect of floating column. Elements that are vertical that rests either on beam or on transfer girder but does not touch the foundation is referred to as a floating or hanging column. A structure with floating columns is used to create more floor space and the floor space may be utilized as a parking lot and considerably more. The transfer girders in seismically active areas must be designed, properly analyzed, and detailed.

OBJECTIVES

- To know the real behavior in tall structure under non- linear static construction sequence analysis considering only dead load case
- To understand the load transfer mechanism in floating column and to eliminate virendel truss action from structure
- To get the analysis results from RCC, Steel structure having vertical irregularity with floating column
- To compare the results which are collated with CSA, ESA and considering load combination to compare the results with RSA

2. MODELLING AND ANALYSIS

The four models consider in this study with two models of reinforced concrete in seismic zone 2, 4 and two models of steel structure in seismic zone 2, 4. The plan and position of floating column is kept same for all four models.

FACE RECOGNITION USING TEXTUAL DATA CLASSIFICATION AND SOFT COMPUTING

Dharamvir[1], Dr. M S Shashidhara[2]

Abstract

The growth of user-generated material through virtual entertainment has made evaluation mining a difficult task. Text data are having data collection opinions on products, trends, and legislative issues as a microblogging platform. Feeling analysis is aprocess for dissecting the mentality, feelings, and assessments of numerous individuals about something, and it is frequently applied on tweets to deconstruct common opinion on news, tactics, social advances, and personalities. Assessment mining can be done without personally going through tweets by using Machine Learning models. Their findings could aid state-run administrations and enterprises in implementing plans, used to recognize feelings by categorizing tweets as happy or sad. The proposed casting a ballot classifier (LR-SGD) with TF-IDF generates the most ideal outcome with 79 percent precision and 81 percentF1 score, according to an inside and out relative presentation research. To confirm the stability of the suggested approach on two additional datasets, one parallel and the othermulti-class dataset, and to get positive results. File TERMS Sentiment examination, message characterization, AI, assessment mining, feeling recognition, man-made reasoning.

[1]Research Scholar, VTU Research Center Department of MCA, The Oxford College of Engineering, Bengaluru, Karnataka India – 560068
[2]Professor & HOD, VTU Research Center Department of MCA, The Oxford College of Engineering ,
Bengaluru, Karnataka India – 560068

Corresponding Author: [1]dhiruniit@gmail.com

FEM Analysis of Railway Brake Disc for Safety of Train

Deepa. N.

Electronics and Communication

Dayananda Sagar University

Bengaluru, India

deepanagaraju66@gmail.com

Sneha Sharma

Electronics and Communication

Dayananda Sagar University

Bengaluru,India

sneha.ece@gmail.com

H N Gayathri

Department of Chemistry

The Oxford College of Engineering

Bengaluru, India

hngayathri@rediffmail.com

Preeta Sharan

Electronics and Communication

The Oxford College of Engineering

Bengaluru, India

sharanpreeta@gmail.com

Rakesh BR

Electronics and Communication

The Oxford College of Engineering

Bengaluru, India

rakisharma2001@gmail.com

Abhishek Gopalakrishna Bhat

Electronics and Communication

The Oxford College of Engineering

Bengaluru, India

abhishekbece2023@gmail.com

Abstract- **Monitoring the temperature of disc brakes is crucial for ensuring their optimal performance in railway applications. To address this issue, a finite element analysis is conducted using Ansys software to assess temperature fluctuations in various parts of the brake under different conditions. Various factors such as payload, speed, and other variables can affect the braking mechanism and lead to brake failure. By installing a FBG sensor on the axle near the contact surface between the brake and the axle, it is possible to detect temperature changes as heat flows from the brake's outer frictional surface towards the axle. This is significant because a small temperature variation near the axle can have the same impact as a large temperature variation near the frictional surface.**

Keywords— Railway Wheel, Thermal and Structural Analysis, Fiber Bragg Grating.

I. INTRODUCTION

A rolling railway has kinetic energy, which must be utilized to stop the train. The simplest method to do this is to convert the energy into heat. In most cases, the change is achieved by applying a contact material to the rotating wheels or the axle-mounted discs. Friction is produced by the substance, which then heats up the kinetic energy. The train gradually comes to a stop as the wheels begin to slow down. Typically, braking materials come in the shape of blocks or pads. Consider a car that is a mile long. The vehicle is so long that the front may be descending while the back is ascending, or the front and back may be moving left while the center is turning right [1].

II. LITERATURE REVIEW

[1] Its length exceeds 300 times its width in the same vehicle. Now it weighs more than 8 million pounds (3,700,000kg), or 4000 tonnes. Televisions, food, and dangerous materials are all present aboard the vehicle. Consider the situation when the driver wishes to halt the vehicle as it is moving at 70 MPH. Although there are hundreds of instances like this every day, it is a complex and difficult topic.

[2] Typically, a disc braking system comprises a caliper, two brake pads, and a brake disc rotor. With the help of all of these elements, a rotating wheel can suffer rapid, severe braking (Hasegawa and Uchida, 1999). The brake disc, which is installed on the axle of a wheel, serves as a brake. It has a circular aperture in the middle and several holes for the wheel bolts all around it. The braking disc turns at the same time as the wheel. When the brakes are applied, a normal load is created, which causes an in-plane friction force to be produced at the disc-pad contact (Sano et al., 2015). This generates a braking torque in the wheel's center of rotation. The reaction of the brake torque is the production of braking force, which slows the vehicle.

When the two brake pads on the rotor's opposing sides apply pressure to one another, the brake disc is activated. The caliper, which is situated above the revolving disc, is where the brake pads are mounted. The cooling of the braking elements is made possible by the fact that the brake disc system's whole structure is airtight. With the help of material friction, disc brakes are frequently employed to slow down moving objects. Due to its exceptional heat management and damping (vibration absorption) properties, gray cast iron is a material that is frequently used to make brake discs (Goo and Lim, 2015). The SAE is in charge of maintaining the requirements for producing gray iron for diverse purposes (Society of Automotive Engineers). These benchmarks are used to establish the optimal range of hardness, chemical composition, tensile strength, and other characteristics required for the intended utilization.. Depending on the need, several types of materials are used to make brake discs (Talib et al., 2018).

[3] To accomplish the needed high performance, transportation industry vehicles are being created to be able to move goods and passengers at faster rates. This necessitates absorbing more kinetic energy when cars are stopped or slowing down. As a result, a vehicle needs a braking system to stop and change its speed under changing road and rush-hour traffic situations. In order to slow down or stop a vehicle's motion, a brake is operated by calipers, which creates frictional resistance on the wheel.

[4] A brake is a mechanical device that prevents motion by slowing down, halting, or preventing the motion of an item in

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Theoretical investigation of Bragg Reflector optical sensor for the measurement of cryogenic temperature

Ranjith B. Gowda [a] [b] 👤 ✉, H.N. Gayathri [c], Preeta Sharan [d], K. Saara [a]

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Abstract

The goal of the proposed work is to design and analyze a low temperature sensor to measure cryogenic temperature in the range of 0–120K. Proposed sensor design uses Distributed Bragg Reflector (DBR) multi-layer structure. DBR consists of high-low alternate dielectric materials arranged in one direction which acts as a one-dimensional photonic crystal (pc). Gallium Arsenide (GaAs) is used as high dielectric material and air as low dielectric material. GaAs dielectric constant is a function of the temperature and hence it can be used to detect any variation in the temperature. In this work, the number of alternate multi-layers (N) is chosen as 8 and the frequency of input electromagnetic wave is taken as 24THz. We achieved a high sensitivity of 1.525nm/K with a Q factor of 3534. The proposed sensor suits for the applications where critical low temperature measurement is needed.

Introduction

The optical properties of photonic crystal (pc) were first studied and developed by Yablonovitch [1] and John [2]. These types of materials have an alternate variation of dielectric constant in defined directions. This makes the crystal to exhibit certain interesting properties for the incident light on it. An incident light is allowed to pass through the structure with certain band of frequency by rejecting in the other regions. The rejected frequency band is termed as Photonic Band Gap (PBG). With the structural modifications of the pc, it is possible to make an input light of specific frequency to propagate through the structure. Many optical devices can be designed, analyzed and fabricated by precisely controlling the light properties inside the structure [3], [4], [5]. One-dimensional (1D) pc has an alternate dielectric constant variation in single direction. Several optical devices were designed using 1D pc like detector [6], switches [7], various sensors [8], [9], and optical filter [10].

Distributed Bragg Reflector (DBR) has periodic structure of stacked high-low alternate dielectric materials over a certain length (N). The incident light on the structure experiences multiple reflections at every

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A Novel Approach to the Study of Oxidation of Cyclohexanol to Cyclohexanone Using Modified Montmorillonite Nanoclays

M. Bhaskar ✉, D. M. Gurudatt, M. Surekha & N. Suma

96 Accesses | Metrics

Abstract

Organic transformations over nanoclay minerals with modified states received remarkable attention in the field of material science, catalysis and chemical engineering. Nanoclay minerals served as a green catalyst because of a greater surface area, significant ion exchangeable phenomenon, good selectivity and specificity, eco acceptability in nature. The study centralizes the preparation of modified nanoclays and cost-effective, non-hazardous oxidation of cyclohexanol. Nanoclays with modified forms was signified by several characterization approaches namely SEM, XRD,

DIGITAL MARKETING AND ITS IMPACT ON THE CONSUMER BEHAVIOUR A STUDY WITH SPECIAL REFERENCE TO SELECT CITIES

Sri Hari V

Assistant professor And Placement Co-ordinator, Dept of Commerce,
Sindhi College, Bangalore.
Email: sheshadri77@gmail.com

Sahana

Associate Professor, Department of Management Studies,
The Oxford College of Engineering, Bangalore, India.
Email: sahanaachyutha2020@gmail.com

Dr. Pratap Desai

Associate Professor, Department of Management studies,
Bharati Vidyapeeth Deemed to be University IMRDA, Maharashtra, Sangli.
Email: pratap646@rediffmail.com

Mohammad Turaab Suhail

Ph.D Research Scholar, Department of Commerce & Business Studies,
Jamia Millia Islamia (Central University), New Delhi.
Email: dr.turaab.jmi@gmail.com

Shanthini S

Assistant professor, Department of Management studies,
Sathyabama Institute of science and technology, Chennai.
Email: shanthinisekar6@gmail.com

M. Mohamed Ilyas

Assistant Professor of Commerce,
Hajee Karutha Rowther Howdia College Autonomous,
Reaccredited with A++Grade by NAAC, Theni, Tamil Nadu.
Email: ilyasmdm@gmail.com

Abstract

Due to the increasingly competitive industry and technological advancements made possible by the use of the internet, traditional marketing tactics are now being replaced by digital marketing methods. Digital marketing is quite popular, and in today's fiercely competitive market, it involves investigating business models that make use of digital technology to save costs and grow operations internationally. In recent years, one of the technologies with the quickest growth rates has been the internet and e-commerce., having a significant influence on people's daily lives. E-marketing is now among the e-commerce and information technology industries' fastest expanding technologies. E-marketing is the process of advertising and selling goods and services online, sometimes referred to as online marketing, or web marketing. To determine the variables affecting young people's

AN EMPIRICAL STUDY ON PROFITABILITY ANALYSIS AT SAA AB ENGINEERING PVT LTD

[1.] Dr V Sravana Kumar, [2.] Prof V Lakshmi Suneetha
[2.]

Associate Professor, Krupanidhi Group of Institutions, Bangalore
Assistant Professor, The Oxford College of Engineering, Bangalore

Abstract: The paper aimed to present a profitability analysis based on ratio method in order to evaluate the financial performance at SAA AB ENGINEERING PVT LTD. Based on the data collected from the balance sheet and profit and loss account concluded in 2021. The following ratios have been determined: gross profit margin, operating profit margin and net profit margin, return on assets, return on capital employed. The obtained results have shown that the profitability of the company has registered an increased slightly in trend in the year 2021 compared to the level recorded in the year 2020 due to the pandemic situation, which is a positive aspect of a good management of material and labor resources. The various tools used for a ratio analysis, comparative balance sheet, common size balance sheet.
Key words: Profitability, financial statement analysis, trend analysis.

INTRODUCTION
SAA AB ENGINEERING: ONE STOP SHOP FOR ALL CUSTOMER REQUIREMENTS

A manufacturing facility called SAA AB ENGINEERING is situated in Bangalore, Karnataka. They are one of Ace Microsmatic main clients. Three of SAAB's four Bangalore-based facilities are in Bommasandra and Jigani. More than 90 turning machines are present in these four units.

Every month, SAA AB produces about 1.2 million parts. Along with serving additionally, they export 25% of their annual sales to Bosch businesses in countries like South Africa, Brazil, Bulgaria, Germany, Spain, and other locations in addition to the Indian market.

Other recommended devices by SAAB include jobbers from Ace Microsmatic Group, single milling turning machines, and milling machines. We chose these machines because, to be completely honest, they operate automatically and without issue. The lack of skilled labor is now our biggest hurdle, however Ace machines enable one person to operate numerous machines simultaneously, helping us to solve the issue. Sanjiv, a co-founder of the SAAB engineers, said.

Mr. Sanjiv continued by saying that the company had gradually expanded over the previous ten years, and that SAAB now competed with brands that were successful at the time. Additionally, they had carved out a strong niche for themselves in both the market and their industry. They started importing iron as raw material in response to customer demand, set up cold forging sections in unit 3, and applied heat treatment inside their own facility.

The industry expertise of SAA AB ENGINEERING helps them to grasp market trends, and projects are built in accordance with such trends. They are very well organized and focused on their future ambitions.

The largest difficulty they now encounter is manpower, therefore they want to replace all of their units with fully automated machinery so that work can be completed more quickly with few employees.

Workforce;
For the precision job, we have 650+ skilled workers.
Managerial personnel: 15%
Supervisory personnel: 18%
Skilled personnel: 67 %

PROFITABILITY ANALYSIS

- ❖ It draws investors to make securities investments.
- ❖ It results in resource allocation that is effective.
- ❖ It boosts management's confidence in the company's expansion and diversification plans
- ❖ Profits are the barometer used to gauge how well a business unit is performing, assuring the safety and protection of shareholders' self-interest
- ❖ It helps to identify the most and least profitable clients.
- ❖ It considers the time value of money.
- ❖ It establishes the specific rate of return for the project.
- ❖ It helps to estimate the cost of capital.

REVIEW OF LITERATURE

Anna Rutkowska-Ziarko (2020) "Profitability ratios in risk analysis." The study's objective as to investigate the connection between a business's accounting prosperity and its capital market return percentage. Also contrasted were betas and accounting betas. The correlation between the overall and semi-variable variability of profitability ratios and rates of return was also looked at.

Ali Saleh Alarussi, Sami Mohammed Alhaderi (2018): It has been stated that any company's long-term viability depends mostly on profitability. Although achieving profitability is the main objective of all commercial endeavors, the elements that influence profitability in emerging nations have received less attention.

AN EMPIRICAL STUDY ON ACCOUNT RECEIVABLES & ACCOUNT PAYABLES MANAGEMENT AT COMPOSITE INVESTMENTS PVT LTD, BANGALORE

Dr. V Sravana Kumar[1], Prof. V Lakshmi Suneetha[2]

[1] Professor, Department of MBA, Krupanidhi Group of Institutions, Bangalore.
[2] Assistant Professor, Department of MBA, The Oxford College of Engineering, Bangalore.
Email: vsravanakumar@gmail.com[1], suneetha.sravan@gmail.com[2]

Abstract

Working capital plays an important role in determining the financial strengths and weakness of a company. The project is entitled to "An Empirical Study on Account Receivables & Account Payables management at Composite Investments Pvt Ltd, Bangalore". The main objective of the study is to analyse financial performance of the Composite Investments Pvt Ltd. Judgement sampling is considered and the sample size of the report is 5 financial years. Data collected is secondary data (balance sheet and profit and loss account) and analyzed using SPSS, by ratio analysis, trend analysis to understand the financial position of the company. It is found that there is a decrease in current liabilities and increase in the current assets over the considered financial years. The suggestions reveal that the company has to strongly focus on reducing working capital strategies that will make the company more profitable. The company has a bright future and can achieve the overall objectives of the company if it concentrates more on its working capital and short-term investments.

Keywords: working capital, ratio analysis, utilization of assets.

Introduction

The securities market is the collective name for the many exchanges and other places where public businesses' stock is bought, sold, and issued. Institutionalized formal exchanges (whether physical or electronic) or over-the-counter (OTC) markets that operate under a specified set of rules are used to facilitate these financial operations. Those stock markets are part of the larger stock market. One or more exchanges may make up the securities market in a particular nation or area. Two of the most significant stock markets in India are the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). Together with numerous additional exchanges operating inside the country, these key national exchanges make up the exchange.

Composite Investments Pvt Ltd firm was established in 2016 and is based at #30/1 S.J Towers, 3rdFloor, Mission Road. It is a GST-enabled business and is registered with the Securities and Exchange Board of India (SEBI).

Review of literature

1) Asiedu, M., Nazirou, S., Mousa, D., Sabrina, S. and Rosemary, A. (2021)

EMPLOYEE STRESS - STRATEGIES FOR MANAGING STRESS AT WORKPLACE

Dr. P.A. Satya Vardhini[1], **Dr. K Tharaka Rami Reddy[2]**
[1]Research Scholar, VTU Research Centre, Department of Management Studies, The Oxford College of Engineering, Bangalore.
[2]Professor & Head, Department of Management Studies, The Oxford College of Engineering, Bangalore.

Abstract
High levels of stress are being encountered by humans today with progress in all respects, human is facing new challenges in many different fields. The belief that one's capacity and capabilities are so little to encounter high levels of stress is common among employees. The complex nature of the concept – of employee stress appears a daunting task to reach a unified definition because of the acknowledged fact that each individual may have different perceptions and interpretations. This paper aims to provide a comprehensive overview of some of the issues and challenges surrounding the concept of employee stress and strategies for managing stress in the workplace. The main cause of low productivity in every organization appears to be stress in the workplace. Employees need certain kinds of motivation and jobs to be productive.
Keywords: Challenges, Employee Stress, Individual, Strategies

1. Introduction

Stress is experienced in private life and at the workplace. People have to work against time and within the parameter of various rules and regulations. It is not always possible to create an organizational climate conducive to work. Various departments, groups, and external environmental factors affect individual behavior. For organizations to operate effectively a minimal level of stress is needed. Excessive stress is harmful to employees, due to the mental and physical disequilibrium its causes and subsequently leads to Mental and physical disturbance. When stress becomes long-term or chronic, it can have serious effects on our bodies. It, therefore, is necessary for organizations to identify causes of stress and implement strategies for managing stress at the workplace so that individual energy is directed towards organizational productivity and a healthy organizational climate is created.

2. Stress

Stress has been called the "Disease of civilization" where stress refers to the strain from the conflict between our external environment and us, leading to emotional and physical pressure. Stress is an internal state which can be caused by physical demands like illness or by environmental and social situations, which are evaluated as harmful when exceeding our levels of coping.
The word stress comes from the Latin words "strictus" (which means "tight") and "stringere" (which means "to tighten") These word roots carry the meaning of restriction and limitedness and reflect individual psychosomatic states under physical pressure or mental demands
The term "stress", as it is currently used was coined by Hans Selye in 1936, who defined it as "the non-specific response of the body to any demand for change"

3. Review of Literature

1) Kavitha in her research titled - Role of stress among women employees forming majority workforce at IT sector in Chennai and Coimbatore (2012), has focused on the organizational role stress for the employees in the IT sector. She found in her research that, women face more

HR ANALYTICS – IS A BUSINESS OPPORTUNITY OR A CHALLENGE?

SUJATHA S G
Research Scholar, The Oxford College of Engineering and Research Centre
VTU Belgaum , Mail id: anandsujatha.ss@gmail.com
Dr K THARAKA RAMI REDDY
Research Guide, Professor & Head, Department of MBA
The Oxford College of Engineering and Research Centre, Mail id: ktrreddy@gmail.com

ABSTRACT:
The human resource (HR) department of any company is critical. It delivers competencies and technical abilities, which are crucial for any organization's long-term success, in addition to information. Organizations have traditionally struggled to assess the quality, status, and future prospects of their human resources. Traditionally, HR evaluations were done by hand, which involved a great deal of subjectivity. However, as technology has progressed, the application of sophisticated data mining analytics techniques to HR data has given analytics a new shape, known as HR-analytics. HR-analytics is already gaining traction as an innovative technique to supplement and later exploit HR for organisational gains. HR-analytics has primarily been used in the Western IT sector, but it is now making inroads into the Indian IT sector as well. As a result of the digital transformation of the company, employees are being pushed to gain new skills and abilities, as well as adapt their behaviour while interacting with others. HR analytics allows businesses to respond rapidly to questions that arise during the transition to a new business model. It is necessary to organise data collection on the company's employees and their actions. Employee records can now be found in a variety of places. Companies collect data on payroll, employee profiles, productivity, and so forth. Data from the corporate network, external social networks, ERP-systems, surveys, and the study of business communication tools can also be gathered. E-mail metadata can now be analysed using new e-mail systems. Based on secondary data and conceptual study, this paper investigates the opportunities and Challenges of HR analytics.
Key words: HR analytics, opportunities, Challenges, Organization, Technology

INTRODUCTION

Human resource analytics, also known as workforce analytics or talent analytics, is a practise that will assist all organisations in handling their human resource data in an effective and efficient manner, hence promoting the expansion of their businesses. In order to make wise decisions with lots of employee data, it is crucial to accurately anticipate critical aspects. The goal of HR Analytics is to serve as a tool that combines several statistical methods to make data collection, analysis, measurement, and forecasting possible. HR strategic choices are made using analytics. Understanding if the outcomes of HR analytics are accurate is made possible by human resource metrics. It aids in evaluating the efficacy and efficiency of organisational human resource policies. Analytics explains what is happening, why it occurred, and what will happen as a result. If there is a managerial-level opinion on an employee's parameters in a company, data is collected to substantiate the opinion through analysis of the appropriate statistic, which may include cost of missed productivity from absence, cost per hire, or another pertinent measure. Analytics shows the effects on the business and assists in determining the causes. The data identifies potential flaws in the evaluation of HR metrics, causing managers to gain insight that eventually contributes to the improvement or averaging of the metric, lessening the impact of the weaker metric data. Key numbers known as human resources

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An Atlas of accurate domination polynomials of connected graphs of order at most six

DE GRUYTER

Highly sensitive temperature sensor using one-dimensional Bragg Reflector for biomedical applications

Ranjith B. Gowda ✉, Preeta Sharan and Saara K.

Abstract

A theoretical investigation of multi-layer Bragg Reflector (BR) structure to design highly sensitive temperature sensor is proposed to measure the temperature over a wide range. Characteristic-Matrix (CM) mathematical tool is used to design and analyse the proposed temperature sensor. A 1D Distributed Bragg Reflector multi-layer structure is used to design and analyse the sensing characteristics of the proposed sensor. Periodic modulation in the Refractive-Index (RI) of the two materials, high and low, forms DBR multi-layer structure. Germanium and air are used as the two alternate materials of BR for high and low dielectric layers respectively. Parameters of many semiconductor materials, including germanium, varies with temperature. Here we have considered RI variation of germanium with the temperature to model and design the proposed sensor. A defect layer is introduced at the center of multi-layer structure to obtain the resonating mode for an incident electromagnetic wave. The sensor can detect temperature over a wide range from 100 to 550 K. A resonating mode, shifting towards different wavelength region is observed for the temperature variations. The influence of increase in the DBR layers (N) and defect cavity geometrical length (l_D) is studied. The obtained results conclude that the cavity defect length and BR layers affects the sensing parameters of the designed sensor. The obtained RI sensitivity, Q-factor, temperature sensitivity and detection limit of the sensor are 2.323 µm/RIU, 115,000, 1.18 nm/K and 9.024×10^{-6} RIU respectively. Theoretically obtained transmission spectrum was validated using Monte Carlo simulation.

Keywords: 1D photonic crystal; Bragg Reflector; characteristic matrix; multi-layer structure; refractive index; temperature sensor

N×N Clos Digital Cross-Connect Switch Using Quantum Dot Cellular Automata (QCA).

- **Author(s):** Asthana, Amita; Kumar, Anil; Sharan, Preeta

- **Abstract:** Quantum dot cellular automata (QCA) technology is emerging as a future technology which designs the digital circuits at quantum levels. The technology has gained popularity in terms of designing digital circuits, which occupy very less area and less power dissipation in comparison to the present complementary metal oxide semiconductor (CMOS) technology. For designing the routers at quantum levels with non-blocking capabilities various multi-stage networks have been proposed. This manuscript presents the design of the N×N Clos switch matrix as a multistage interconnecting network using quantum-dot cellular automata technology. The design of the Clos switch matrix presented in the article uses three input majority gates (MG). To design the 4 × 4 Clos switch matrix, a basic 2 × 2 switch architecture has been proposed as a basic module. The 2 × 2 switching matrix (SM) design presented in the manuscript utilizes three input majority gates. Also, the 2 × 2 SM has been proposed using five input majority gates. Two different approaches (1&2) have been presented for designing 2 × 2 SM using five input majority gates. The 2 × 2 SM design based on three input majority gate utilizes four zone clocking scheme to allow signal transmission. Although, the clocking scheme used in 2 × 2 SM using three input MG and in 2 × 2 SM approach 1 using five input MG is conventional. The 2 × 2 SM approach 2 design, utilizes the clocking scheme in which clocks can be applied by electric field generators easily and in turn the switch element becomes physically realizable. The simulation results conclude that the 2 × 2 SM is suitable for designing a 4 × 4 Clos network. A higher order of input-output switching matrix, supporting more number of users can utilize the proposed designs.

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Bragg reflector one-dimensional multi-layer structure sensor for the detection of thyroid cancer cells

Ranjeet Kumar Pathak, Sumita Mishra, Preeta Sharan

Abstract

In the proposed work, a defect cavity multi-layer Bragg reflector structure is proposed theoretically to find the presence of thyroid cancer cells in the given sample. The modelling, design and analysis of the sensor is performed using characteristic matrix method (CMM). Proposed structure has central defect cavity with 6 pairs of low and high refractive index layers on each side of the defect. To enhances the sensor sensitivity, the incident light in mid-infrared frequency range is used as input light source. The refractive index of normal and thyroid cancer cells is analysed for the performance of the sensor. The obtained Q factor and sensitivity of the sensor design is 3729 and 2828 nm/RIU respectively. The proposed sensor is a best choice of optical sensor for the detection of thyroid cancer cells in the given test sample for accurate analysis in medical applications.

Keywords

Bragg's reflector; characteristic matrix method; micro-cavity; photonic crystal; thyroid cancerous cells;

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Two-Dimensional Photonic Crystal Biosensor Based on Gallium Arsenide Composite Semi-conductive Material for Diabetes Detection

Manjunatha N, Sarika Raga ✉, Sanjay Kumar Gowre, Hameed Miyan & Preeta Sharan

Abstract

In this study, a gallium arsenide (GaAs) composite semi-conductive material is used as rods with an air background lattice point as a photonic crystal for the detection of diabetes using urine, blood, and tear samples. The refractive index (RI) of bio-samples at various concentrations is used to determine the interaction between light and analyte. As a result, there is a good wavelength shift and light confinement in the detecting region. The photonic bandgap (PBG) and optical characteristics of light are measured using the plane wave

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Numerical modelling of 1-dimensional silicon photonic crystal sensor for hydrostatic pressure measurement

Ranjith B. Gowda, Preeta Sharan ✉ and Saara Khamar

Abstract

In this work, a highly sensitive hydrostatic pressure sensor using one-dimensional (1D) photonic-crystal (PC) is designed and analyzed numerically for its sensing performance. The device design has silicon (Si) sensing layer at the top to sense the applied pressure. The proposed sensor performance has been studied for its pressure sensing, by applying boundary load on the sensing layer. The structure is designed, simulated and analyzed using an FEM tool. As the applied pressure is varied from 0 MPa to 10 MPa, resonant mode shifts towards the higher wavelength region. The effect of defect cavity length and the number of periods are also analyzed to choose the optimized value which enhances the sensor performance parameters. Simulation result shows that the proposed sensor has a very high sensitivity of 250 nm/GPa and Q-factor of 11,120 with the transmission of 99.99%.

Keywords: FEM; multi-layer structure; photonic crystal; pressure sensor; transfer matrix

Corresponding author: Preeta Sharan, Department of Electronics & Communication Engineering, The Oxford College of Engineering, Bangalore, India, E-mail: sharanpreeta@gmail.com

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Research | Published: 13 April 2023

Design of Two-Dimensional Photonic Crystal Defect Microcavity Sensor for Biosensing Application

Preeta Sharan ✉, Tahani A. Alrebdi, Abdullah Alodhayb &
Anup M. Upadhyaya

Silicon (2023)

45 Accesses | Metrics

Abstract

In the proposed work we designed and analysed a
two-dimensional photonic crystal based sensor for
three different biosensing applications, including
measuring the normal and abnormal levels of uric
acid, glucose, and creatinine in the blood. We
examine the sensitivity, Q factor, and wavelength
shift of two different types of sensor cavity design.
The simulation approach used a finite difference
time domain method. The work has made use of
electromagnetic equation propagation, MEEP tool
from the Massachusetts Institute of Technology.
The maximum sensitivity of the proposed sensor is

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Numerical Analysis for Flat Wheel Detection at Different Wagon Load

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Suchandana Mishra ; V. Sharmili ; Saptha Sree M. ; Sneha S. ; Saara K. ; Preeta Sharan   **All Authors** •••

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Abstract:
As there are many ways of locomotion in many parts of the country, but the most common and the least expensive locomotion for travelling and transporting heavy goods from one place to another place are railways, the most preferred ones. As the country develops, the transportation also develops from time to time. The most main criteria for improvement in railways are to improve the contact system of railway wheel to the tacks. A constant and consistent study on the rail-wheel system contact was tested for improve the values of railways. Our paper presents the finite element analysis with a rail-wheel model to get more accurate values of flat wheel contact. Optical sensors like fiber Bragg grating sensors gives the wavelength shift for various train conditions unloaded 22.3t to 70t, with sensitivity of 1.39 pm/με. This work gives idea on the improved process of the setup and the synthesis of the prospective exploratory techniques followed by ascendable, automotive, and working analysis.

Published in: 2023 10th International Conference on Computing for Sustainable Global Development (INDIACom)

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Design and Analysis of Pressure Sensor based on Micro Hole Photonic Crystal Slab

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Preetam Ambudkar ; Anup M Upadhayaya ; Preeta Sharan ; Nisha C Rani   **All Authors** •••

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Abstract:

This study presents a novel photonic crystal (PC) pressure sensor design and three-dimensional (3D) modeling and simulation for three different structures. A 2D PC slab based on silicon is used to implement the device on a SiO2 substrate. Using Ansys Workbench and the Rsoft Optical tool, strain/stress simulations, as well as spectrum simulations, are carried out. In this study, the deformation of various structures, including rectangular, circular, and square diaphragms, as well as variations in refractive index are taken into account when calculating the sensitivity of the suggested pressure sensor. The numerical findings demonstrate that when pressure is applied, the refractive index fluctuations increase the transmission spectrum's resonant wavelength while the deformation factor decreases it. It has been demonstrated that there is a linear relationship between the applied pressure and the intended micro-resonant cavity's wavelength. The square diaphragm has shown maximum sensitivity compared to other structures. For the minimum detectable applied pressure of 0.5 Pa, the simulation result shows that for the three types of datagrams rectangle, square, and circular it is found that there is a distinct shift in wavelength. For the circular diaphragm's shift in wavelength is 742 μm, whereas the rectangle and square observed shift in wavelength is 956 μm and 1016 μm respectively. This can be applied in biomedical applications. The proposed sensor system has shown feasibility for future fabrication.

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Effective Brain Tumor Segmentation for MRI Image Analysis using Dual Attention Network based YOLACT++

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Neil Roy ; Sandip Kumar Roy ; Preeta Sharan   **All Authors** •••

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Abstract:
A Brain Tumor is an abnormally growing clump of cells inside or around the brain, which can lead to a fatal situation if not detected at an earlier stage. Therefore, we present an Artificial Intelligence (AI) approach based on the YOLACT++ image segmentation model. In this technique, we introduced a two Dual attention network on the YOLACT++ architecture for the identification and segmentation of scanned MRI (Magnetic Resonance Imaging) for a brain tumor. We have applied the concepts of transfer learning by using RESNET-50 with Feature Pyramid Networks (FPN) as the backbone of our work. The experiment setup includes 400 images as a training set, and the results show that the proposed method achieved 94.71% segmentation accuracy for each segmentation. The proposed method is significantly higher than the previously published dice score of 88% for the Convolutional Neural Network (CNN) based approach.

Published in: 2023 10th International Conference on Computing for Sustainable Global Development (INDIACom)

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FEM Analysis of Railway Brake Disc for Safety of Train

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Abstract:

Monitoring the temperature of disc brakes is crucial for ensuring their optimal performance in railway applications. To address this issue, a finite element analysis is conducted using Ansys software to assess temperature fluctuations in various parts of the brake under different conditions. Various factors such as payload, speed, and other variables can affect the braking mechanism and lead to brake failure. By installing a FBG sensor on the axle near the contact surface between the brake and the axle, it is possible to detect temperature changes as heat flows from the brake's outer frictional surface towards the axle. This is significant because a small temperature variation near the axle can have the same impact as a large temperature variation near the frictional surface.

Published in: 2023 10th International Conference on Computing for Sustainable Global Development (INDIACom)

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I. Introduction

A rolling railway has kinetic energy, which must be utilized to stop the train. The simplest method to do this is to convert the energy into heat. In most cases, the change is achieved by applying a

Applied Mathematics in Science and Engineering ›

Volume 31, 2023 - Issue 1

Research Article

A new model to detect COVID-19 patients based on Convolution Neural Network via l1 regularization

Chrispin Jiji, Annie Bessant, K. Martin Sagayam, A. Amir Anton Jone,
Hatıra Günerhan & Alphonse Houwe ✉

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∑STRACT

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The 2019 new coronavirus illness (COVID-19) is an international public health emergency. Our social and healthcare systems are under a great deal of strain as a result of the daily increase in infection rates and fatalities. Doctors typically perform a chest X-ray to identify the diseased areas of the lungs since pneumonia is a common type of infection that spreads in the lungs. In this paper, we propose a Convolution Neural Network via the li regularization model to detect COVID-19

In this article   ^

Research Articles

ASALD: adaptive sparse augmented lagrangian deblurring of underwater images with optical priori

Chrispin Jiji, R. Nagaraj & Vivek Maikandavel ✉ iD

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ABSTRACT

Owing to absorption, reflection, diffraction and, deplorable conditions, the capturing of underwater images present more challenges for the consumer. The proposed work focuses on Enhanced Augmented Lagrangian for image deblurring with additional performance-enhancing optical and sparse derivative prior to model the underwater imaging. The proposed method using Augmented Lagragian with Optical and Sparse Derivative prior is novel in the following ways: (i) usage of optical prior modeled after underwater imaging conditions, taking into account deformations and distortions that accompany the capture of underwater images (ii)

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A Novel Technique For Enhancing Underwater Visibility Using Non-Local Stretch Directional Gradient

A Chrispin Jiji[1], Vivek Maik[2] and Vijay Kumar Gowda[2]

chrispinjij@gmail.com

[1] Department of ECE, The Oxford College of Engineering, Bangalore, Karnataka, India

[2] Department of ECE, SRM Institute of Science and Technology, Chennai, Tamilnadu, India

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Abstract

Owing to the many effects of the underwater medium, underwater images are often captured with a hazy quality. These effects are caused by suspended particles in the image forming phase, which cause light absorption and scattering. On account of these pictures with fluctuating levels of dimness and colour variation, traditional algorithms have several disadvantages. Underwater image enhancement's main goal is to increase the clarity and contrast of underwater photographs in order to solve these issues. Our paper describes a novel technique by combining several algorithms characteristics for achieving the following goals: i) better scattering, (ii) grey world assumption, (iii) non-Local stretch Directional Gradient process. For example, a better scattering model would be better at modelling hazy scenes and overcoming the image illumination dimming effect. Second, f

IOT BASED AUTOMATIC FOREST FIRE DETECTION BASED ON MACHINE LEARNING APPROACH

Dr. A Chrispin Jiji[1], Dr. KDV Prasad[2], Nagarajan Jeyaraman[3], Dillip Narayan Sahu[4*], Dr A.Yasmine begum[5], Nitin Jagannath Patil[6]

[1]Associate Professor, Department of ECE, The Oxford College of Engineering, Bangalore, Karnataka, India.

[2]Assistant Professor(Research), Symbiosis Institute Of Business Management, Hyderabad, Telangana, India.

[3]Assistant Professor, Department of EEE, Dr. Mahalingam College of Engineering and Technology, pollachi, Tamilnadu, India.

[4*]Assistant Professor, Department of MCA, Gangadhar Meher University, Odisha, India.

[5]Associate professor, department of EIE,sree Vidyanikethan Engineering College, A.rangampet, Andhra Pradesh, India.

[6]Professor, Instrumentation Engineering, D. N. Patel College of Engineering Shahada Maharashtra,India.

Corresponding Author Email-id: Dillip1seminar@gmail.com

Abstract

There are many applications for monitoring the environment thanks to the development of wireless sensor networks and the Internet of Things. As a possible use case for WSNs and the Internet of Things, we investigated the issue of monitoring and detecting forest fires in this paper. The current environmental damage is mostly caused by forest fires. The current forest fire monitoring system falls short in its ability to continuously provide real-time monitoring for every location within a target region and to facilitate early danger identification. Forest fires pose a significant hazard to the ecosystem as a whole, contributing to both global warming and ozone layer loss. The potential answer to decrease the cause or the danger of a fire occurrence by up to 95% is early detection. There are several strategies that may be used to keep woodlands fire-free. The technologies that may be helpful for the early identification of forest fires include satellite systems and unmanned aerial vehicles. Although these systems are capable of covering any geographical area, they are unable to provide real-time information on the full region of interest. Additionally, satellite-based and UAV-based systems are only suitable for monitoring and battling fires. Therefore, it is very vital to make accurate predictions of forest fires at an early stage.

Keywords: Forest, Fire, Internet of Things, Detection, Wireless Sensor Network and Actuator.

1. Introduction

An overview of the worldwide context for forest fires is provided in this section. Studying forest fires is crucial to understanding their causes and establishing the need for further research. The most uncontrolled occurrence that seriously disturbs the whole ecosystem is a forest fire, which must be dealt with by using WSN technology. The motivation for this research's endeavour is to

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Original Research │ Published: 02 October 2022

Simulation and excitation analysis of nano aperture-array for surface plasmon based memory applications

Srujana Ramachandra, M. V. Panduranga Rao & Preeta Sharan ✉

39 Accesses │ Metrics

Abstract

This study ponders the prospect of a Plasmon enabled optical memory device to achieve higher data transfer rates and data density. The device is based upon Silicon as a substrate, Silver metal and Silicon nitride sandwiched between them. Paper discusses simulation based excitation analysis of two design variations of a memory device labelled device 1 and device 2, focusing upon the metal layer containing Nano aperture, with an area of 250 nm² using 650 nm light source. Simulations are carried out with the help of opti-FDTD and Rsoft (FullWAVE) tools. Through the comparative analysis of Electric field intensity, switching speed

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Research Article | Published: 08 November 2022

Comparative analysis and design of high-performance photonic crystal add–drop filter for optical switching

Amita Asthana ✉, Anil Kumar & Preeta Sharan

Abstract

Photonic crystal add–drop filter structures are promising technology for optical communication networks. This paper presents the design of H-shaped photonic crystal add–drop filter that consists of one straight waveguide and four arm waveguides. A ring resonator-based add–drop filter has been proposed with upper and lower waveguides for light propagation. A triangular-shaped add–drop filter has also been designed using two-dimensional photonic crystals (2D-PCs) also with high optical transmission capabilities. Numerical methods such as plane wave expansion and finite-difference time-domain method have

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Original Research │ Published: 02 September 2022

Novel design of reversible latches using feynman gate and implementation of reversible combinational circuits

Amita Asthana ✉, Anil Kumar & Preeta Sharan

Abstract

Quantum Dot Cellular Automata (QCA) technology is gaining popularity for its low power requirements, high speed and efficient miniaturization of digital circuits. Especially, digital circuits now need to be realized and investigated at quantum levels. The manuscript presents the design of several combinational and sequential logic circuits by employing reversible quantum gates such as Peres gate, Thapliyal Ranganathan (TR) gate and Feynman gate (FG) using QCA technology. The manuscript presents the novel design of various latches (D, T, JK and SR) using Feynman gate. The manuscript also demonstrates

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Compactness measure of rail wheel rolling contact of the freight wagon

Suchandana Mishra ✉, Preeta Sharan & K. Saara

Abstract

This paper describes the measure of compactness using finite element analysis and stress–strain characteristics of freight wagon considering loaded and unloaded condition of wagon weight. Freight train wagons are used to carry various goods from one part to other parts of country. In terms of preserving the originality of the contact load transfer, the use of accurate finite element loading and boundary conditions has been a significant use. The main idea is to study the strain behaviour of goods wagon for empty and gross load condition. As the weight varies from low to high, that means from 22.47t to 88.47t, strain induced on rail increases linearly with the wagon load. This analysis is important as it determines the capacity

Real time implementation of fiber Bragg grating sensor in monitoring flat wheel detection for railways

Suchandana Mishra [a] ✉ , Preeta Sharan [b] ☺ ✉ , K. Saara [a] ✉

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Highlights

- Rail-wheel analysis of the train.

- Real time monitoring and detection of the train wheel passage using optical sensor fiber Bragg grating sensor.

- Positions of grating sensors installed on the rail.

- Time domain and frequency spectrum analysis for the strain data induced on the rail when train passes by, to detect wheel flats.

- Reflection spectrum analysis for good wheel and bad wheel of a passenger train.

Abstract

Wheel flats are a key source of issues in railway systems, as they generate significant wear on both the infrastructure and the train carriages. Flat zones on the wheel tread are created by the wheel sliding unintentionally on the rail. They can cause serious damage to the train and accidents, so identifying worn wheels is critical for human safety and rail transit. The purpose of this study is to present the real-time implementation of fiber Bragg grating sensors on rail tracks and to investigate the train's flat wheel status. By considering passenger train running at speed 70kmph, it has been monitored for 35 sec in the interrogator. Real time analysis of strain induced in the rail was calculated and it has been found from the sensor reading there is peak value of strain of the order of 303.4 $\mu\varepsilon$ which implies that wheel flatness is present whereas for normal wheel strain value is minimal up to 173.23 $\mu\varepsilon$. By collecting experimental strain data simulation has been done and shift in peak wavelength at 1550.804nm and reflectivity obtained was 89.3% for flat wheel. Simulation result shows that there is a remarkable wavelength shift for the flat wheel and normal wheel from the Bragg center wavelength.

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Rohit Dattatreya Hegde ; Raksha D S ; Ashwini V. R ; Preeta Sharan ; Anup M. Upadhyaya ; Ciro Rodriguez   **All Authors** •••

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Blood separation involves isolation of particles and cells present in the blood that are called blood products - viz red blood cells, white blood cells, plasma, and cryoprecipitates. Separation of whole blood into its blood products helps the patients to get only the necessary required part from whole blood. The design in this paper gives the idea of the separation of platelets from whole blood using the di-electrophoresis principle. The device is designed in such a way that it separates platelets with a reduced power consumption with 2.5 volts. It records an efficiency of 99.10% with minimum time duration or segregation of 0.7s making it an efficient design for blood segregation units. The simulation of this design showed successful separation of platelets with a high degree of accuracy.

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Micro-opto-electro-mechanical system based microcantilever sensor for biosensing applications

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New Trends and Applications in Internet of Things (IoT) and Big Data Analytics pp 93–107

Chapter

Design and Analysis of Outer Rotor Brushless DC Motor for Robotics Using Ansys Maxwell Software

Mohammad Kamrul Hasan, Yashu Verma, Preeta Sharan,
Manpreet S. Manna & Shayla Islam

Abstract

Brushless DC (BLDC) Motors are attracting
considerable interest from robotics industry for
most of the last decade. They are highly durable
and weightless than other devices with
approximately equal power outputs, and they are
ideal for high-speed robotic applications This
chapter presents a design and performance analysis

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New Trends and Applications in Internet of Things (IoT) and Big Data Analytics pp 139–148

An Optical Solution for High-Density Data Storage Using Plasmonic Based MZI Nano-Structures

R. Srujana, Thangadurai Natarajan, Mohammad Kamrul Hasan, Preeta Sharan, Manpreet S. Manna & Shayla Islam

Chapter │ First Online: 17 May 2022

244 Accesses

Abstract

The mounting demands for superior data processing and data storage due to the rapid growth in data analytics has led a new direction towards optical data computation and storage technology. Towards this endeavor, we have designed and simulated a Mach-Zhender

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Nodule Detection in Infrared Thermography Using Deep Learning

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Ranjeet Kumar Pathak ; Sumita Mishra ; Preeta Sharan ; Sandip Kumar Roy   **All Authors** •••

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Abstract:
Imaging is an important tool in the diagnosis of thyroid anomalies and early detection reduces the possibility of cancer stage. Imaging examinations are expensive and frequent exposure can harm the patient. Digital Infrared Thermal Imaging in conjunction with image processing techniques presents a suitable alternative in finding out the thyroid nodules since diseased tissues have high temperature due to large flow of blood as compared to normal tissues that have low temperature. Convolutional Neural Network (CNN) can be used to identify the regions that represent malignant nodules. In this work, a method for the classification of thyroid nodules in infrared thermographic images into benign and malignant classes by using a deep convolutional neural network is presented. The developed Convolutional Neural Network designed for the specific problem has an accuracy of 91.11%. The obtained precision is 0.9167, and a recall value of 0.93076.

Published in: 2022 IEEE 7th International conference for Convergence in Technology (I2CT)

Date of Conference: 07-09 April 2022

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Oral Cancerous Cell Detection using Modified Effective Refractive Index Method

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Nandhini V L ; Malini V L ; V. Vaishnavi ; Preeta Sharan ; O. P. Singh ; Spoorthi PK   **All Authors** •••

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II. Sensor Design and Methodology

III. Modified Effective Refractive Index Method

IV. Results and Observations

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Abstract:
Photonic sensing is an upcoming technology with high precision measurements used for bio-sensing applications. In this work, a three-section coupled line photonic crystal structure in the form of a parallel waveguide has been proposed which uses a two dimensional Photonic-Crystal (PhC) sensor. The Modified Effective Refractive Index (MERI) technique is utilized to analyse PhC design using the Meep tool. To study the sensor performance, the analytes chosen were the INOK(Human immortalized normal oral keratinocyte) and the YD-10B(Human oral squamous cell carcinoma). The sensor performance was compared with a Fabry Perot microcavity structure and an appreciable value of Q factor variation was observed. In this report, the proposed sensor has been designed to be presented as a parallel waveguide photonic sensor giving sensitivity around $1.2 \ \mu m/RIU$ and Q factor 9517.5 with a cost-effective fabrication profile which is best suited for the biomedical applications.

Published in: 2022 9th International Conference on Computing for Sustainable Global Development (INDIACom)

Date of Conference: 23-25 March 2022

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Design of Temperature Monitoring for Wheel using Optical Sensor in Railway Safety System

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Deepa N ; Preeta Sharan ; Shwetha K ; Vaibhav Meshram   **All Authors** •••

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Abstract:
One of the most crucial situation in railways is excess wheel temperature that leads to major disasters. Rise in temperature is majorly caused due to braking and defects in axle box, which leads to wheel skidding, derailment, hot wheel, irregularities in wheel and other safety complications. In this work, wheel temperature warning range is taken between 150 °C to 300 °C and this range is used to observe the stress and strain behavior on railway wheel in ANSYS Workbench software. Sensing temperature distribution is performed by steady state thermal analysis. The framework is taken from the thermal analysis to perform static structural analysis. The result obtained gives a good understanding of temperature distribution on wheel with respect to stress and strain from structural analysis. The obtained result from ANSYS is converted into equivalent wavelength shift. Design and simulation of Fiber Bragg Grating (FBG) sensor is performed in GratingMOD optical tool. Sensitivity of Fiber Bragg Grating is observed to be 13.08pm/°C for this temperature range and Bragg's wavelength 1550nm.

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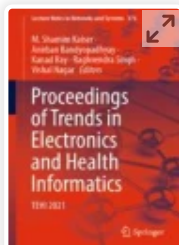
MonoLayer Graphene-Based Plasmonic Biosensor for Urine Glucose Detection

Archana Yadav, Anil Kumar & Preeta Sharan

Conference paper | First Online: 22 March 2022

452 Accesses | **1** Citations

Abstract

In this proposed work, a plasmonic biosensor based on graphene has been presented to detect the biosample consisting of urine glucose. The proposed biosensor is comprised of five layers in the order of prism/Au/Si/graphene-sensing medium. P-polarized monochromatic light of 633 nm has been used for the excitation of the plasmons at the metal–semiconductor interface. This simulation study shows, by optimizing the

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2-D transition metal dichalcogenides assisted SPR biosensor for rapid detection of urine glucose

Archana Yadav (/profile/Archana.Yadav-4315420), Anil Kumar (/profile/Anil.Kumar-4369203), Preeta Sharan (/profile/Preeta.Sharan-8844), Kamakshi Manchikalapati (/profile/Kamakshi.Manchikalapati-4369205), Srinivas Talabattula (/profile/Talabattula.Srinivas-12168)

Author Affiliations + ()

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Abstract

A completely novel Surface Plasmon Resonance (SPR) biosensor based on 2 D material Graphene and Transition Metal Dichalcogenides (TMDC) WS2 (Tungsten disulfide) is proposed for the detection of the urine glucose concentration levels. This proposed structure is comprised of the five-layered in the order of the Prism- Au-Graphene-WS2-Biosample.

Bio sample is having the glucose level in the range of 0 -15 mg/dl (for normal person) and 0.625 gm/dL, 1.25 gm/dL, 2.5 gm/dL, 5 gm/dL, and 10 gm/dL (for diabetic person) respectively with the corresponding refractive indices of 1.335,1.336,1.337,1.338,1.341,1.347.

The performance parameters ie. reflectance SPR curves and sensitivity are obtained for the optimized thickness of Gold (Au), Graphene, and WS2 layers, by using the transfer matrix method. Compared with the conventional SPR based biosensor, graphene-WS2 layers can increase the sensitivity of the biosensor. The highest sensitivity of the SPR biosensor with an optimized thickness of 50 -nm Au/0.34-nm Graphene/1.60-nm WS2 is 211 °/RIU which is approximately 40% and 15% higher than the sensitivity of the conventional biosensor and the graphene-based biosensor respectively. Due to its unique optical properties, WS2 remarkably enhances the sensitivity of the proposed sensor in the detection of glucose concentration. Additionally, it is expected that the proposed biosensor has the potential to be fabricated in the scale of nonorange and can be used where the continuous monitoring of glucose is required because of its significant response corresponding to the minute change of 0.001 in the refractive index of the biosample.

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KEYWORDS

Biosensors

Glucose

Reflectivity

Graphene

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An observational study to find out the awareness and attitude of undergraduate medical students towards 2019-novel Corona virus in Rama Medical College Hospital and Research Centre, Hapur

Kumar, A.; Archana, K.; Pathak, N. K.; Ahmad, A.; Dahiya, P.; Varshney, P.; Sharan, P.; Deepna, R.; Prajapat, R.; Gandhi, A..

Palavras-chave

adult; article; awareness; coronavirus disease 2019; coughing; demography; female; human; major clinical study; male; mask; medical information; medical school; medical student; mouth; nonhuman; observational study; pandemic; public health service; questionnaire; Severe acute respiratory syndrome coronavirus 2; sneezing; antibiotic agent

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Theoretical investigation of Bragg Reflector optical sensor for the measurement of cryogenic temperature

Ranjith B. Gowda [a] [b] 👤 ✉, H.N. Gayathri [c], Preeta Sharan [d], K. Saara [a]

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Abstract

The goal of the proposed work is to design and analyze a low temperature sensor to measure cryogenic temperature in the range of 0–120K. Proposed sensor design uses Distributed Bragg Reflector (DBR) multi-layer structure. DBR consists of high-low alternate dielectric materials arranged in one direction which acts as a one-dimensional photonic crystal (pc). Gallium Arsenide (GaAs) is used as high dielectric material and air as low dielectric material. GaAs dielectric constant is a function of the temperature and hence it can be used to detect any variation in the temperature. In this work, the number of alternate multi-layers (N) is chosen as 8 and the frequency of input electromagnetic wave is taken as 24THz. We achieved a high sensitivity of 1.525nm/K with a Q factor of 3534. The proposed sensor suits for the applications where critical low temperature measurement is needed.

Introduction

The optical properties of photonic crystal (pc) were first studied and developed by Yablonovitch [1] and John [2]. These types of materials have an alternate variation of dielectric constant in defined directions. This makes the crystal to exhibit certain interesting properties for the incident light on it. An incident light is allowed to pass through the structure with certain band of frequency by rejecting in the other regions. The rejected frequency band is termed as Photonic Band Gap (PBG). With the structural modifications of the pc, it is possible to make an input light of specific frequency to propagate through the structure. Many optical devices can be designed, analyzed and fabricated by precisely controlling the light properties inside the structure [3], [4], [5]. One-dimensional (1D) pc has an alternate dielectric constant variation in single direction. Several optical devices were designed using 1D pc like detector [6], switches [7], various sensors [8], [9], and optical filter [10].

Distributed Bragg Reflector (DBR) has periodic structure of stacked high-low alternate dielectric materials over a certain length (N). The incident light on the structure experiences multiple reflections at every

Sensitivity enhancement of a plasmonic biosensor for urine glucose detection by employing black phosphorous

Archana Yadav, Anil Kumar, and Preeta Sharan

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Abstract

Genetic expression and clustering analysis related to DNA micro-arrays using optical sensor manufactured using silicon material

G. Sowmya Padukone [a,*], H. Umadevi [b]

[a] Department of Electronics & Communication Engineering, Faculty of Electronics & Communication Engineering, The Oxford College of Engineering, Affiliated to Visveswaraya Technological University, Bangalore 560068, Karnataka, India
[b] Department of Electronics & Communication Engineering Faculty of Electronics & Communication Engineering, Dr. Ambedkar Institute of Technology, Affiliated to Visveswaraya Technological University, Bangalore 560056, Karnataka, India

ARTICLE INFO

ABSTRACT

Every human being is different from each other. Every Organism has thousands of cell in their body. Genes encrypts Cells. The function of the cell is determined by Genes. Many diseases may occur due to Cell Mal function. The Cells in our body is different & based on Evolution of Cells the genetic Expression could be decided. The intensity of Proteins in our body decides the relative Genetic Expression in a Human body. The binding level of Proteins determines the Genetic Expression level. DNA levels decides the amount of Protein in our body. Measuring the Genetic Expression is a technique for determination of Characteristics of Living Organism. The Information encrypted within Genes produces Proteins. The procedure for making the Genes ON & OFF is said to be as Gene Regulation. Here DNA Micro-Array Analysis techniques have been used to measure Genetic Expression. The Relative Expression level of the Micro-Array Spots will be determined by Using Optical Sensor using MATLAB which a mathematical & Simulation Tool. Cancer is a Chromosomal disease. By Studying genetic expression, Cancer & other type of Diseases could be identified. Different types of Genes are identified & their relative Peak values & Intensity Values are determined. This Technique could be used to Control Cancer, Diabetes & other types of Diseases. The material used is made of Microscpic Glass Slide made up of Silicon (Si) material.

1. Introduction

Proteins are constituted by Amino acids & the Residues of Amino acids. Proteins promote Metabolic actions in the human body & other Living Organisms are transferred from generation to generation by Genes. The binding between Proteins controls the Enzyme activities also. The Physical or Chemical Process occurrence between cells in an organism results in transmission [1] of signals between them. When expression level is Yellow it signifies both are at the same level. If the Expression level is Red then the cell could be categorized as Cncerous similarly if the Cell expresses Green then it Signifies the Cell is non-cancerous.

The Proteins generated by Genes could be identified by two methods. They are-Edman Degradation and Mass Spectrometry.

2. Existing methodology

The first method **Edman Degradation** Produces Proteins by the following method. The Amino acids are arranged in the Peptide form in this method.

The above Fig. 2.1 shows the Edman Degradation process with different steps. The left over part in the Protein sequence will be removed by Edman Degradation Process in a very effective manner.

The major disadvantage with this method is that the position of Protein in the Peptide Sequence could not be determined. The major advantage with this method is that even after removal of the Residue, the Protein remains intact in its operation.

(ii) Mass-Spectroscopy method-It is a method in which the Fragments [1] are transformed to fast moving positive Ions by overwhelming with Electrons. After striking with Electrons, the charged particles which are obtained are separated according to

* Corresponding author.
  E-mail address: sowmyapk121@gmail.com (G. Sowmya Padukone).

BALLORG: State-of-the-art Image Restoration using Block-augmented Lagrangian and Low-rank Gradients

Laya Tojo[1], Manju Devi[1], Vivek Maik[2], and Gurushankar[3]

[1] Department of Electronics and Communication, The Oxford College of Engineering, Bangalore-560068, India
[2] Department of Electronics and Communication Engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai,Tamil Nadu, India
[3] Laboratory of Computational Modeling of Drugs, Higher Medical and Biological School, South Ural State University, Chelyabinsk-454080, Russia

* Corresponding Author: Vivek Maik, maik.vivek@gmail.com

* Regular Paper

Abstract: In this paper, we propose a blind image deblurring algorithm using block-augmented Lagrangian and low-rank priors (BALLORG) as a non-learning method that can give better results without the complexity of learning-based methods. The proposed algorithm achieves faster convergence within 20 iterations than conventional methods. Regularization priors are used in the form of gradients and sparse low-rank matrices, and recursive rank improvements result in better deblurring performance. The steepest descent in minimization is maintained through weight selection for penalty and regularization parameters. The block processing introduces local and global optimization, leading to better visual quality outputs. The proposed method has excellent performance in terms of the PSNR, SSIM, and FSIM matrix, which is on par with or better than that of other state-of-the-art learning and non-learning-based approaches.

1. Introduction

Recent advances in the commercial electronics industry include increases in display resolution for visual image-output devices. This means that older images and videos shot on lower-resolution cameras can be blurred when displayed on the latest high-resolution screens. To counter this compatibility problem, we need to use super resolution along with deblurring algorithms to provide a high-quality output on the screen [1]. The deblurring is needed in this instance because of the fact that the super resolution algorithm always tends to introduce slight blurriness or smoothness in the image, which can be removed using a deblurring algorithm.

The severity of these blurs is not that heavy and does not require the complexity of a learning-based method.

Most times, the blurs can be modelled with uniform and Gaussian features. There can be other areas of image capture and processing where we can encounter blur in images (mostly due to auto focal point error, handshake, camera movement, etc.).

As soon as the photons entering the cameras are converted to a voltage and quantified at a CMOS sensor, the only way to correct the image is with digital post-processing using digital imaging algorithms, such as the BALLORG method proposed here. Also, in many cases, the digital post-processing must happen before the image is viewed or transmitted, requiring real-time processing so that it can viewed seamlessly in high quality. As it is well established in the literature, we have deblurring algorithms that have ill-posed problems and seek an optimal solution for the ill-posed problem, which can be computationally expensive and require lengthier computation time.

The main focus of the majority of deblurring and digital reconstruction techniques is computation speed. Iterative loops that increase with the image size are used in high-resolution pixel-based image and video processing, which enable the coupling of an extremely powerful CPU with imaging technology. The proposed deblurring algorithm BALLORG is intended to solve the following

Image Denoising Using Multi Scaling Aided Double Decker Convolutional Neural Network

Laya Tojo[1], Vivek Maik[2], Manju Devi[1]

[1] Department of Electronics & Communication, The Oxford College of Engineering, Bengaluru, India.
[2] Department of Electronics & Communication, SRM Institute of Science & Technology, Kattankulathur, Chennai, India.

Corresponding Author: VivekMaik

Abstract

The digital image suffers from noise during transmission and reception. By preserving the qualities of the image, image denoising assists in the recovery of high-quality photos without noise (edge, corners, and sharp structures). Deep convolutional neural networks (CNNs) have been successfully employed for picture denoising due to their shifting topologies. Traditional approaches suffer from a number of drawbacks, such as a lack of adaptability when handling spatially invariant noise and the requirement for numerous models to denoise images. In this study, a novel approach that combines the advantages of various algorithms to achieve the objectives listed below. (1) Better performance (2) Faster processing (3) Less complexity in the denoiser (4) Extracting complementary characteristics to increase the denoiser's overall capacity. In terms of qualitative and quantitative analysis it has been evaluated and the simulation findings show that the Multi Scaling Aided Double Decker (MUS-ADD) convolutional neural network strategy is superior to other approaches.

Keywords: Multi Scaling, Double Decker, Ill-posed problem, Noise Optimization, Adaptive Filtering, Feature Extraction, Image Reconstruction

1. INTRODUCTION

Due to the effect of the surroundings, channel, transmission, reflection and other variables, images are invariably tainted by noise during transmission, acquisition, and compression, resulting in distortion and loss of visual quality and information. Noise problem in image processing techniques including video processing, picture analysis, and tracking are crucial in today's image processing systems. Image denoising is a technique for removing noise from a noisy image and restoring the original image. Denoised photos may lose some high frequency components such as edge, corners, texture, and so on. As a result, it's become increasingly crucial in recent years to extract usable information from noisy images. Academicians have a difficult time with image denoising since it is an inverse problem with a single solution. The equation for image denoising is $y = n + x$, where y represents the received noisy image, x represents the unknown sharp noise free image, and n represents additive white Gaussian noise (AWGN). The recovery of higher-quality images from noisy images is aided by past literature works such as Principal Component Analysis (PCA), Median Absolute Deviation [1], and Block-based Estimation [2]. Edge protection, texture preservation, and smooth area recovery are all challenges with image denoising.

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Efficient Puncture and Non Puncture Architecture of Turbo Encoder on FPGA for Advanced Communication System

Rashmi R, Manju Devi

Keywords: no

Abstract

Abstract -This paper concentrates on plan and execution in-vehicle framework chip with the help of efficient turbo encoder. This module is fostered with the help of FPGA implementation. Both sequential and equal calculations for the encoding strategy are contemplated. Basically two Methodologies were implemented. Fostering the equal calculation technique utilizing convey skip snake, it is shown that both chip size and handling time are gotten to the next level. The rationale usage is improved by diminished region. The Turbo encoder module is planned, recreated, and integrated utilizing Xilinx apparatuses. Xilinx vertex low power is utilized

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IOT BASED AUTOMATIC FOREST FIRE DETECTION BASED ON MACHINE LEARNING APPROACH

Dr. A Chrispin Jiji[1], Dr. KDV Prasad[2], Nagarajan Jeyaraman[3], Dillip Narayan Sahu[4*], Dr A.Yasmine begum[5], Nitin Jagannath Patil[6]

[1]Associate Professor, Department of ECE, The Oxford College of Engineering, Bangalore, Karnataka, India.

[2]Assistant Professor(Research), Symbiosis Institute Of Business Management, Hyderabad, Telangana, India.

[3]Assistant Professor, Department of EEE, Dr. Mahalingam College of Engineering and Technology, pollachi, Tamilnadu, India.

[4*]Assistant Professor, Department of MCA, Gangadhar Meher University, Odisha, India.

[5]Associate professor, department of EIE,sree Vidyanikethan Engineering College, A.rangampet, Andhra Pradesh, India.

[6]Professor. Instrumentation Engineering, D. N. Patel College of Engineering Shahada Maharashtra,India.

Corresponding Author Email-id: Dillip1seminar@gmail.com

Abstract

There are many applications for monitoring the environment thanks to the development of wireless sensor networks and the Internet of Things. As a possible use case for WSNs and the Internet of Things, we investigated the issue of monitoring and detecting forest fires in this paper. The current environmental damage is mostly caused by forest fires. The current forest fire monitoring system falls short in its ability to continuously provide real-time monitoring for every location within a target region and to facilitate early danger identification. Forest fires pose a significant hazard to the ecosystem as a whole, contributing to both global warming and ozone layer loss. The potential answer to decrease the cause or the danger of a fire occurrence by up to 95% is early detection. There are several strategies that may be used to keep woodlands fire-free. The technologies that may be helpful the early identification of forest fires include satellite systems and unmanned aerial vehicles. Although these systems are capable of covering any geographical area, they are unable to provide real-time information on the full region of interest. Additionally, satellite-based and UAV-based systems are only suitable for monitoring and battling fires. Therefore, it is very vital to make accurate predictions of forest fires at an early stage.

Keywords: Forest Fire, Internet of Things, Detection, Wireless Sensor Network and Actuator.

1. Introduction

An overview of the worldwide context for forest fires is provided in this section. Studying forest fires is crucial for understanding their causes and establishing the need for further research. The most uncontrolled occurrence that seriously disturbs the whole ecosystem is a forest fire, which must be dealt with by using WSN technology. The motivation for this research's endeavour is to

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Title

Improving Low Illumination image based on Multi-Scale Retinex via Bilinear Interpolation

Authors

Dr. A Chrispin Jiji

Abstract

Images taken at night in low-light situations are more likely to have poor visibility, which can affect future processing for outdoor computer vision applications. As a result, we recommend a retinex upgrade for nighttime image enhancement. Retinex is one of the most widely used techniques. It's used on photographs with non-uniform brightness in terms of colour or lightness, and it gets the job done in terms of colour consistency and dynamic range compression. Few studies have looked into retinex's performance on night-time photos, especially those taken in challenging conditions (i.e., images with over- or under-lit areas, or images with noisy speckles), where the technique can fall short. The original multi-scale retinex via Bilinear Interpolation (MSRBI) is particularly sensitive to camera noise speckles in low light, and it has a poor effect on areas with ordinary or irradiated light. In low-light circumstances, the original MSR is particularly sensitive to noise speckles produced by cameras, and it performs poorly in areas with normal or bright lighting. In addition, the original MSR used a gain-offset technique for pre-display processing, which could result in visible data loss on night-time images. This study replaces MSR's logarithm function with a customised sigmoid function to prevent data loss, and adapts MSRBI to night-time photography by combining sigmoid-MSR findings with original images.

Key Words

Multi-scale retinex, Bilinear interpolation, sigmoid function, high-light preserving

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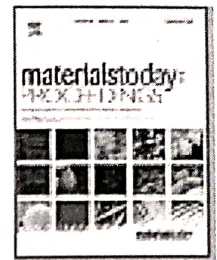**Print This Page**

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Disease prediction and detection in animals by DNA genetic engineering using optical sensor based on silicon material

G. Sowmya Padukone [a], H. Umadevi [b]
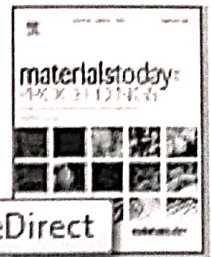
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Implementation of Link based Probability Routing Algorithm for Achieving Desired Quality of Service

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R.Bhargava Rama Gowd ; N Sridhar ; K Venkateswaran   All Authors

Abstract

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Abstract:
Global routing algorithms maintain the state information at each node, but as the number of nodes increases it becomes difficult to provide the best routing path, thus localized Quality of Service routing (QoS) gave relax to global routing from the overhead by taking routing decisions only founded on locally numerical information relatively to global state information. This paper introduces "Link Blocking Probability" (LBP) which is an algorithm based on localized QoS. This mechanism lowers the overheads linked with global state information at every point which increases the performance of routing. The algorithm which is proposed is compared with "localized routing algorithm (CBR)", and "contemporary global routing algorithm (WSP)". This paper presents the proposed algorithm which works more efficiently than the "CBR" and "WSP" algorithm and improves the overall network performance.

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Impact of Sink Mobility on Quality of Service Performance and Energy Consumption in Wireless Sensor Network with Cluster Based Routing Protocols

2017 IEEE/ACS 14th International Conference on Computer Systems and Applications (AICCSA)

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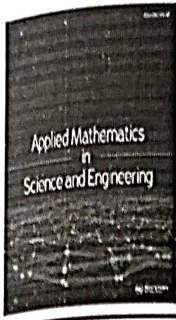
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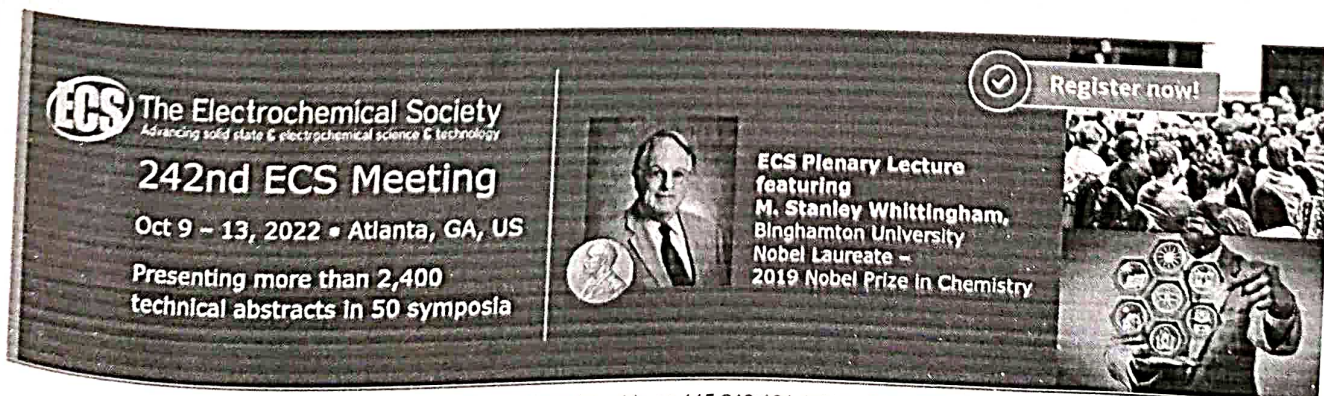View related articles ☑

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Pre-current amplifier based transimpedance amplifier for biosensors

Jyoti M. Roogi[1], Manju Devi[2]

[1]Department of Electronics and Communication Engineering, CMR Institute of Technology Bengaluru, Bengaluru, India
[2]Department of Electronics and Communication Engineering, The Oxford College of Engineering, Bengaluru, India

Article Info

ABSTRACT

In this paper, we present current amplifier based transimpedance amplifier (TIA) for biosensor applications. Proposed design has low-noise, high Transimpedance gain that can be used for low current measurement applications. The current amplifier based TIA is implemented in order to resolve the fabrication issues related to high value feedback resistor. In this design, the input block to TIA is a low amplitude current amplifier. The designed amplifier is implemented in 90 nm complementary metal-oxide semiconductor (CMOS) technology. The design achieves transimpedance gain of 800 kΩ with a bandwidth of 5 kHz and input referred current noise is of 0.152 pA/$\sqrt{HZ}$ for an input of 41 nA bypassed from current amplifier with input of 200 pA.

Corresponding Author:

Jyoti M. Roogi
Department of Electronics and Communication Engineering, CMR Institute of Technology
Sri Nivasa Reddy Layout, AECS Layout, Marathahalli, Bengaluru, Karnataka 560037, India
Email: jyotimr@gmail.com

1. INTRODUCTION

In the field of biosensor and optical communication low current measurement is one of the important block as instrumentation system or readout circuit is concerned. For any biosensor or optical photonic readout circuit measuring low current and processing for further usage is one of the complex task. Apart from sensor field TIA can be used in the design of optoelectronics devices. In order to perform this step a sensitive and fast current measurement device is used i.e., transimpedance amplifier (TIA). Designing a TIA with constraints like low noise, low power and high transimpedance gain found to be complex. metal-oxide semiconductor (CMOS) TIA is preferred because of CMOS advantages with respect to scaling and performance parametrs. For implementation TIA two configurations called open and closed loop are followed. Open loop TIA uses common gate configuration for low input impedance and in this configuration noise is more. In the case of closed loop configuration feedback which includes shunt-shunt configuration is followed.

Usually in closed loop TIA feedback resistor is used for conversion of low current input from sensor or photodiode to equivalent voltage. In open loop configuration input referred noise is high because of this reason open loop TIAs are not suited for the design of front ends. For higher gain common source amplifier, cascade amplifier or a CMOS inverter are used.

TIA design procedure mainly involves design of amplifier with feedback resistor. The resistor plays a very important role in converting current to voltage. TIA topologies has been introduced and analyzed by authors with respect to design and topologies. Various TIA topologies have appeared in including various fields and also many domains which make the choice of the best TIA topology, but for a certain application is

Block Chain Driven Intelligent Communication System for IoT

Dr Sheetalrani R Kawale[1], Dr.B.Srilatha[2], Dr.N.S.Gowri Ganesh[3], Mr. Girish M[4], Dillip Narayan Sahu[5], A. Seshaiah Sade[6]

[1]Assistant Professor, Department of Computer Science, Karnataka State Akkamahadevi Women's University, Vijayapura, Karnataka, India.

[2]Associate Professor, Department of Electronics and Communication Engineering, The Oxford College of Engineering, Bangalore, Karnataka, India.

[3]Associate Professor, Department of Artificial Intelligence & Data Science, Saveetha Engineering College, Chennai, Tamil Nadu, India.

[4]Assistant Professor, Department of Computer Science and Engineering, Gopalan College of Engineering and Management, Bangalore, Karnataka, India.

[5]Lecturer, Department of MCA, School of Computer Science, Gangadhar Meher University (GMU), Sambalpur, Odisha, India.

[6]Assistant. Professor, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur, Andhra Pradesh, India.

Abstract

The Internet of Things (IoT) is made up of a network of connections for a large number of physically heterogeneous devices, and it also has a lot of security vulnerabilities. IoT is a sophisticated method of connecting various computer and communication equipment using their own unique identities. IoT combines numerous technologies, including mobile devices, industrial machines, animals (or) humans, or other physical-digital entity to work together to accomplish the application's goal. This creates a collaborative environment. However, there are a number of security concerns, a few of which being Denial-of-service (DoS) attacks, Data Theft (or) Data Breaches, and Botnet attacks, in which several systems attempt to take control of the victim's system and steal the victim's private data. Various security-based techniques have developed in the present to provide a beneficial security feature; these approaches may be broadly divided into cryptographic-based and non-cryptographic-based approaches. Although both has benefits and drawbacks, choosing a cryptographic-based method is more generally adopted. According to the report, blockchain technology has a crucial role to play in providing security for IoT.

Keywords: IoT, Block chain, Security, Algorithm and Attacks.

1. Introduction

IoT is a sophisticated method of connecting various computer and communication equipment using their own unique identities. IoT combines numerous technologies, including mobile devices, industrial machines, animals (or) humans, or other physical-digital entity to work together to accomplish the application's goal. This creates a collaborative environment. However, there are a number of security concerns, a few of which being Denial-of-service (DoS) attacks, Data Theft (or) Data Breaches, and Botnet attacks, in which several systems attempt to take control of the victim's system and steal the victim's private data. As they are utilised to expand network coverage, unsecure devices are the key security problem in edge computing and IoT frameworks. Additionally, certain IoT devices have the ability to switch across networks, posing a severe security risk.

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Classification of Diabetes Disease using Adaptive Bio-Inspired Gene-Level Deep Neural Networks

Section A-Research paper

Classification of Diabetes Disease using Adaptive Bio-Inspired Gene-Level Deep Neural Networks

Jyothsna Devi.Kuchipudi[1], Dr.B.Srilatha[2], Dr. Rajkumar Gangappa Nadakinamani[3], Dr. Vani V G[4], Dr. Rakhi Kamra[5], Dillip Narayan Sahu 6*

[1]Assistant Professor, Department of Food Technology, Sree Sastha Institute of Engineering and Technology, Chembarambakkam, Chennai, India.

[2]Associate Professor, Department of Electronics and Communication Engineering, The Oxford College of Engineering, India.

[3]Specialist Cardiologist, Badr Al samaa Hospital, Muscat.

[4]Assistant Professor, Department of Computer Science and Engineering, Government Engineering College, Hassan Karnataka, India.

[5]Assistant Professor, Department of Electrical and Electronics Engineering, Maharaja Surajmal Institute of Technology , New Delhi, Delhi, India.

[6*]Assistant Professor, Department of MCA, Gangadhar Meher University, Odisha, India.
*Email: dillip1seminar@gmail.com

Abstract
The vast amount of information in a medical database makes data classification a difficult challenge in data mining. When used to medical data, associative classification improves classification accuracy and disease prediction. With this goal in mind, the proposed study presents three methods for accurately categorizing patient medical data via the creation of optimal association rules. The three methods are Logistic Fully Recurrent Deep Neural Learning Classification (LFRDNLC), Adaptive Bio-Inspired Gene Optimization Based Deep Neural Associative Classification (ABGO-DNAC), and Gene Optimized Association Rule Generation based Integral Derivative Gradient Boost Classification (GOARG-IDGBC). The improved results for diabetic illness diagnosis with higher classification accuracy and less time consumption are produced by using the aforementioned three recommended methodologies. The suggested GOARG-IDGBC method's primary objective is to boost classification precision while diagnosing diabetes. The fitness function of each characteristic is evaluated as part of an optimized evolutionary algorithm to generate the best possible set of association rules. The suggested GOARG-IDGBC method employs an integral derivative gradient boost classifier to perform classification based on previously specified association rules (IDGBC). Attributes are categorized using a decision tree in IDGBC.
Keywords: Data mining, Medical data, LFRDNLC, Deep Neural Learning, Gradient and Gene Optimization.