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Research Article

The effect of copper oxide nanoparticle additives on the rheological and tribological properties of engine oil

Harsh Gupta, Santosh Kumar Rai, Nippani Satya Krishna & Gagan Anand

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Abstract

The rheological and tribological properties of 0.5%, 1.0%, 1.5% and 2% CuO nanoparticles by weight blended in engine oil were studied. Surfactants were used to ensure maximum possible dispersion of the nanoparticles in engine oil. Samples were tested for viscosity, stress, torque and shear rate to be compared with data for just engine oil. Characterization of the Copper Oxide nanoparticles was done using an XRD, FTIR, photoluminescence, UV-Vis spectroscopy and Particle Size Analyzer.

Overall, nanoparticle additives seem to result in lower viscosity and lower torque. There was also a force of friction and wear test done on a pin-on-disk machine for

Conference Paper PDF Available

IOT SENSORS: A KEY ELEMENT TO CHANGE THE FUTURE OF STRUCTURAL HEALTH MONITORING

January 2021
Conference: THE INTERNATIONAL CONFERENCE ON FUTURISTIC TECHNOLOGIES 2021 · At: IIT DELHI
Project: IOT SENSORS: A KEY ELEMENT TO CHANGE THE FUTURE OF STRUCTURAL HEALTH MONITORING

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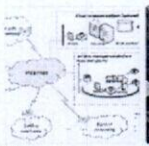
Abstract and Figures

Structural health monitoring (SHM) is one of the modern and innovative methods adopted for monitoring integrity, structural safety and performance analysis without affecting the structure itself. The effectiveness of the IOT sensor in relatees to Structural health monitoring is presented here. Wireless Sensor Networks (WSN) have largely preferred due to their prominent characteristics for structural Health Monitoring like flexibility, deploy-ability, cost-effectiveness and lightweight. However, in most of the monitoring system, the traditional usages of wireless sensor networks are recorded with low power consumption, small data size, low duty cycle and low data rate. The Structural Health Monitoring system also needs stability measurement, real-time-synchronization, large data size, high data rate, and comparatively high Sampling data rate. This presented study outlined the synchronization need of wireless and represents how the network aggregation capacity and clock-drift and measurement stability is resolved.



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An International Journal
Volume 39, 2021 - Issue 6

Articles

Characterization and experimental investigation of rheological behavior of oxide nanolubricants

Harsh Gupta, Santosh Kumar Rai, Piyush Kuchhal & **Gagan Anand**

Pages 651-656 | Published online: 07 Aug 2020

Abstract

Nanolubricants are nano fluid, colloidal nanoparticle suspension, which are specially used for machine lubrication of the engine. Nanolubricants exhibit special tribological properties that have potential applications in mainly automotive industries. Performance of an engine is a function of the lubricant being used. A study of rheological behaviors of nanolubricants has been beneficial in understanding the influence of nanolubricants on shear rate and shear stress. This study is concerned with characterization and rheological behavioral studies of five nanolubricants, i.e., SnO_2, TiO_2, Fe_3O_4, CuO and ZnO mixed with engine oil at 1%

Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications

Optimizing the performance parameters of injection-molded polymer spur gears

Prashant Kumar Singh, Akant Kumar Singh, Siddhartha, Prabir Sarkar

First Published December 3, 2020 | Research Article
https://doi.org/10.1177/1464420720977561

Abstract

This research focuses on the optimization of the performance parameters namely, surface temperature, wear rate, and transmission efficiency of polymer gears. Three different polymers namely, acrylonitrile butadiene styrene, high-density polyethylene, and polyoxymethylene are selected for manufacturing the gears. A total of 27 experiments are carried out to test these gears at different torque and speed conditions. The torque values are taken as 0.8, 1.2, and 1.6 Nm, whereas the speeds of 600, 900, and 1200 r/min are chosen for the study. The optimal setting of operating parameters (gear material, speed, and torque) is obtained by using a hybrid multi-criteria decision-making approach that includes the analytical hierarchy process and technique for order of preference by similarity to ideal solution. The optimal setting of performance parameters is obtained with polyoxymethylene gear running at the torque and speed conditions of 0.8 Nm and 900 r/min, respectively.

Keywords

Polymer gear, optimization, injection molding, transmission efficiency, AHP–TOPSIS

CFD and thermo-hydraulic analysis of multiple arc roughened absorber plate with gaps used in solar air heaters

Navneet Kumar Pandey, V. K. Bajpai, Abhishek Sharma & Sanjay Yadav

Received 02 Sep 2019, Accepted 12 Sep 2020, Accepted author version posted online: 16 Sep 2020, Published online: 28 Sep 2020

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ABSTRACT

Repeated rib elements are used as roughness medium to increase heat transfer. An experimental and numerical analysis has been performed to study the influence of number of gaps on absorber plates pasted with arc-shaped roughness elements with gaps to study the heat transfer (Nu) and friction factor (f) used in solar air heaters (SAHs). ANSYS was used to simulate the air flow through a rectangular passage. A heating source of 1000 W/m^2 was provided on the top of the surface to simulate the radiant energy of the sun. Twenty seven combinations of roughened duct were investigated using the software as well as on an experimental set-up. The

A Novel Scheme for Industrial Safety and Security with GSM

Ankit Kumar Rai1*, M. A. Ansari1, Pragati Tripathi and Astha Sharma, Aruna Pathak, Monika Jain

Abstract

In this paper, we tried to upsurge the level of safety and security system by conjoining new techniques and added new perceptions to develop low cost GSM based industrial safety and security system. In industries, safety, security and automation is a principal concern. Industrial automation, safety and security system design is developing these days. The designing of this safety & security system is simple hardware circuit. It allows every user to use this wireless security system by combining PIR motion sensor, smoke sensor, fire/flame sensor, IR sensor, laser sensor, temperature sensor and other failure detector at industrial level.

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Articles

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Attacks in Underwater Sensor Network

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ABSTRACT

UWSNs are discovered to an advanced class of security malicious attacks. In this paper we explain two types of attack active and passive attack and explain which attack is more prominent in underwater sensor network. In during research deliberation has not taken security in UWSNs. WSN security cannot be direct use in UWSNs. Due to acoustic channel, incalculable environment and other communication issues in UWSNs. In this paper we explain all types of attack in UWSNs. UWSNs are unsafe to various attacks and solution of these attacks should be discussed. Some uniqueness and attacks of UWSNs and underwater acoustic channels are presented and discussed in detail.

Keywords - Underwater, Environments, Active Attacks, Passive Attacks, Security.

1. INTRODUCTION

In underwater different types of attacks, threats and vulnerabilities present to corrupt and break the underwater nodes security. These attack that compromise the security of the underwater nodes. The security attacks can be classified into two types there are active and passive attacks where the attacker gains illegal access to the underwater acoustic channel resources. In active attacks the attacker cut off the connection and convert the information, while in passive attack the attacker motive of reading and analyzing and convert the transmit information not for altering it is the big difference within active and passive attacks.

2. COMPARISON OF PASSIVE AND ACTIVE ATTACKS

Comparison Based	Active Attacks	Passive Attacks
Basic	In active attack the attacker can cut off the connection and convert the information, underwater acoustic channel resources or affect their operation.	In passive attack the attacker motive of reading, analyzing and convert the transmit information. It does not altering and do not affect the system resources.
Information modification	Occurs	Does not take place. It can't modify any information.
Nodes harmful	Always causes damage to the nodes.	Do not cause any harm.
Threat to	Availability and Integrity	Reliability
Attack awareness	When attack occurs the entity gets informed	The entity does not get informed.
The attacker perform task	The transmission is captured by physically controlling the portion of the link	Just need to observe the transmission
Emphasis is on	Detection	Prevention

3. ACTIVE ATTACKS

The active attacks the attacker cut off the connection and convert the information, while in passive attack the attacker motive of reading and analyzing and convert the transmit information attacks in which the attacker tries to modify the information or creates a false message. A broad range of software vulnerabilities, potential physical and network the prevention of active attacks is quite difficult. But prevention, it emphasizes on the detection of the attack and recovery from any disruption or delay caused by it. An active attack mostly requires more dangerous implication and more effort. When the hacker attempts to attack, the victim gets aware of it. Shown in fig.1

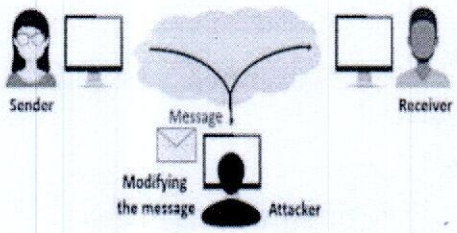

Fig.1 Active attacks

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Conference Paper

Data communication Issues in Underwater Sensor Network

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Impact of Workplace Happiness on Employee Engagement: A Comparative Study of IT & Non-IT sector employee

by Sana Vakeel, Sunita Shukla, Vikas Singh

Abstract: Being happy at workplace is all about enjoying what employees do and admire where they work.rnWorkplace h an employee, but also for thernorganization one works for. Since employees spend much of their lives at the workplace, i workplace happiness on various factors such as jobrnsatisfaction, employee engagement and effective organizational con impact of workplace happiness on employee engagement for employees workingrnin the IT and non-IT sectors in Delhi-N that 22.7% ofrnthe variation in the employee engagement is explained by workplace happiness. The impact ofrnworkplac found to be almost similar in IT and Non ITrnsector employees. The study uses Karl Pearsons correlation and regression a

Keywords: *Workplace Happiness; Employee Engagement; Job Satisfaction; Information Technology.*

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A STUDY ON SERVICE QUALITY GAPS IN INDIAN BANKS USING SERVQUAL MODEL IN DELHI/NCR

June 2020

Authors:

Rashmi Kaushik
ITS Engineering College

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Abstract and Figures

Economic significance of services sector in India has been increasing considerably. The services sector has been the major contributor to India's GDP over the past few decades. It contributed around 49% to the country's GDP in the year 2018, up from 15% in 1950. The services sector grew at 7.5% in the post-liberalisation era (1991-2000), compared with a growth rate of 4.5% in the pre-liberalisation regime i.e. 1951-80. It provided employment to about 31% of workforce in 2018. The banking sector has played a vital role in the economic development of India. Presently, the sector is fairly vast in terms of product range, supply and reach. In comparison to other banks located in their region, Indian banks generally have strong and transparent balance sheets with lesser bad debts. Meeting customer expectations is one of the major challenges currently faced by private and public sector banks in the country. That is why service quality in a key concern for the banking sector strategists. This paper attempts to measure the level of service quality offered by banks situated in the Delhi/NCR region. The empirical research uses primary data collected from retail customers of various banks through developing a questionnaire based on SERVQUAL model given by Parasuraman et al (1988). This paper also includes a comparative analysis of service quality levels offered by public and private sector banks. The research would help in finding out quality gap in services offered by banks using GAPS Model, while identifying areas of improvement in Indian banks. INTRODUCTION The banking sector in India has experienced a lot changes in its functioning and structure after the liberalisation of the country in 1991. The competition in the sector has intensified a lot with the entry of a lot category of banks in the industry. There are a total of 182 banks, including 18 nationalised banks, 42 private sector banks, 33 state cooperative banks, 45 regional rural banks and 44 foreign banks operating in the country (RBI). Banks have been involved in developing customer-centric strategies for gaining sustainable competitive advantage. To grow and survive in the competitive environment, it is significant for banks to offer quality service to their customers. Studies suggest that offering quality service not only helps in generating customer satisfaction, but also a plays key role in acquiring new customers as well as retaining existing customer with the organisation. Numerous studies indicate that improving service quality also helps in generating positive word of mouth, enhancing corporate image, reducing costs and increasing profitability (Kang & James, 2004; Kumar et al., 2010).

Correlation between... | Correlation between reliabil... | Correlation between... | Mean and Standard... | Mean and Standard...

International Journal of Future Generation Communication and Networking
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A Novel Scheme for Medical Image Compression using Huffman and DCT with Water Marking

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Abstract

Image compression is one of the data compression applications in which we convert the original data into a few bits. In image compression we can simply preserve the data needed by removing unwanted data to be proficient to record or refer data in a functioning form. Hence the image compression reduces the communication time and increases the communication speed. We mainly use lossy & lossless technics to remove this type of problem. There is no data loss when we compress images with a lossless image compression technique while some of the unnecessary data losses in lossy image compression technique. By using these processes, we can reduce the data size, which we can save more data in less memory. Here we have done the uses of Huffman & DCT techniques for image compression. In order to analysis medical image we have used the DWT feature extraction technique. Here for security we have done watermarking tool in medical image.

Keywords-*Image Compression, Lossy & Lossless techniques, Huffman & DCT coding, DWT feature extraction technique and Watermarking.*

I. INTRODUCTION

Image compression is an application of data compression in which we convert the original image to some bits. With the help of image compression, we compress the medical image to facilitate transfer of this from one place to another [1]. In image compression we can reduce the dimensions of the original data to reduce the size of the original data. When we compress a medical image, our purpose is to make sure that none of the original image is the lost of the required data. Compression technics are technically advanced to allow large files to be compressed easily. By quick improvement in a suitable way via impressive procedures a huge scope of image data ought to store those images typically outcomes in the compressing images. There are some algorithms used to complete these. Types of compression in several actions such as lossless and lossy. The image that needs to be compressed to a pixel range of grayscale, ranging from 0 to 255.While compressing any data it must be kept in mind that any data required will not be lost in the body [2]. Also, low bits are needed in saving data in digital media and sending. Compression to some range shows that there is a section of data whose size is required to decrease. Now this JPEG format is absolute option for digital image. The Joint Photographic Expert Group (JPEG) which depends on discrete cosine transform (DCT) is a very extensively second choice formula for compression. Image compression is one of the incredible femiliar way in image operation. In this way we can have many basis ideas and play a significant role in the actual storage and transmission of images. In image compression, in the proposed model to reduce unnecessary data we will use less sample to facilitate sending and saving of this. The main goal of reducing the number of bits per large base to compress images is to decrease the transmission time to display this image and broadcast the image and regenerate once again by Huffman encoding [3].

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Regular paper

A compact short ended dual band metamaterial antenna loaded with hexagonal ring resonators

Monika Singh [a], Navneet Kumar [b], Pradyot Kala [c], Santanu Dwari [d]

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Abstract

A compact short ended coplanar waveguide (CPW) feed dual-band antenna encouraged with metamaterial using composite right/left-handed transmission line (CRLH - TL) technique presented here. The antenna designed to operate at series resonance as the performance of the antenna categorised by the combination of series (L_{se}, C_{se}) elements. This proposed antenna embraces two novel hexagonal ring resonators (HRR) connected to patch in order to excite higher-order modes, results in bandwidth expansion from 53.2% (f_c=7.03GHz) to 84.07% (f_c=8.29GHz). In addition to this, antenna is compact with an electrical size of $0.149\boldsymbol{\lambda_0} \times 0.22\boldsymbol{\lambda_0} \times 0.01\boldsymbol{\lambda_0}$ at $\boldsymbol{f_0}$=2.23GHz. The simulated averaged radiation efficiencies of the proposed antenna throughout the first band and the second band are 85.3% and 93.2% respectively. Also, the measured result indicates that the antenna intended to operate over the frequency bands 2.19–2.33GHz and 4.83–10.87GHz with 10dB fractional bandwidth of 5.73% and 74.54% respectively with a measured peak gain of 1.29dB at 2.23GHz and 4.81dB at 7.7GHz. It observed that the measured results are worthy promising with the simulated one. Due to these attributes, the proposed antenna is an aspirant for recent wireless communication like Bluetooth, WLAN/Wi-Fi band, HiperLAN1 (5.15–5.3GHz), HiperLAN2 (5.47–5.72GHz) and for X – Band Applications.

Introduction

With the growing demand of wireless communication, many challenges emerge for designing wireless communication devices such as low weight, small size, portable, low price, etc. Researchers are engaged to meet these demands of the users. It requires innovation of high performance, multi-featured devices with a high profile of compactness. Substrate material plays a significant role in the revelatory improvement of characteristics of microwave devices such as anti-group and phase delay, negative permeability- permittivity and zero propagation constant. Utilizing these properties, the researchers are working on multiband, wideband, high efficiency, low cost, high gain antenna designing. The metamaterial is a suitable material for achieving these properties in an antenna [1], [2], [3]. Miniaturization of an antenna can be achieved by zeroth-order resonance (ZOR) technique, as ZOR frequency becomes independent of