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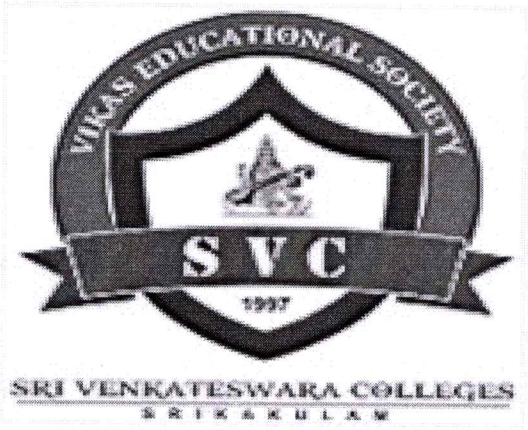
Research Publications During Assessment Period: 2018-19 to 2022-23



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List of Research Publications during Assessment Period 2018-19 to 2022-23

S.NO	Title of paper	Name of the author/s	Department of the teacher	Name of the journal	Year of publication	ISSN number /Volume
1	The Role of Biomedical Engineering and Physical Therapy in the Management of Chronic Achilles Tendonitis in Athletes Chronic Illness	Arikathota Uday Kumar	Electronics Communication & Engineering	International journal of Basic & Applied Research	2018	2249-3352 Vol:8
2	The Role of Biomedical Engineering and Physical Therapy in the Management of Chronic Achilles Tendonitis in Athletes Chronic Illness	G.M. AnithaPriya Dharshini	Electronics Communication & Engineering	International journal of Basic & Applied Research	2018	2249-3352 Vol:8
3	The Role of Biomedical Engineering and Physical Therapy in the Management of Chronic Achilles Tendonitis in Athletes Chronic Illness	DasariSyam Babu	Electronics Communication & Engineering	International journal of Basic & Applied Research	2018	2249-3352 Vol:8
4	The Role of Biomedical Engineering and Physical Therapy in the Management of Chronic Achilles Tendonitis in Athletes Chronic Illness	Patnaikuni Sowmya Keerthana	Electronics Communication & Engineering	International journal of Basic & Applied Research	2018	2249-3352 Vol:8
5	Performance And Emission Characteristics Of A V.C.R C.I Engine Using Chicken Waste Based Bio-Diesel With Blended Fluels	P.Sivaram	Mechanical Engineering	International Journal of Trend in Scientific Research And Development (IJTSRD	2018	2456-6470, Vol. 2
6	Thermal Analysis Energy Performance and Parameter Identification of a Steel Annealing Future Using Ansys	P.Padmavathi	Mechanical Engineering	International Journal of Management, Technology And Engineering	2018	2249-7455 Vol: 8

7	Experimental Analysis of VCR Engine Performance Using Methyl its Diesel Blends	K.Eswara rao	Mechanical Engineering	International Journal of Research engineering, Science and Management	2018	2581-5782 Vol: 1
8	Design and Structure Thermal Analysis of Turbine Rotor Blade With Radial Holes Using Solid works	N.Mahesh kumar	Mechanical Engineering	International Journal of Trend In Scientific Research Development	2018	2456-6470 Vol: 3
9	Design and Structure Thermal Analysis of Turbine Rotor Blade With Radial Holes Using Solid works	P.SivaRam	Mechanical Engineering	International Journal of Trend In Scientific Research Development	2018	2456-6470 Vol: 3
10	Design And Analysis of I,C Engine Combustion Chamber Using CFD	K.Srinivasarao	Mechanical Engineering	Journal of Emerging Technologies and Innovative Research	2018	2349-5162 Vol: 5
11	Design and Analysis of Circulating Fluidized Bed (CFB)Boiler At Different Namofluids	M.Venkateswara rao	Mechanical Engineering	Journal of Emerging Technologies and Innovative Research	2018	2349-5162 Vol: 5
12	Advice on how to prepare a research paper in the field of engineering	Chakravarthi, V.K	Civil Engineering	International Journal of modern Electronics and Communication Engineering	2019	2321-2152 Vol:7
13	Advice on how to prepare a research paper in the field of engineering	Tammineni Sravan Kumar	Civil Engineering	International Journal of modern Electronics and Communication Engineering	2019	2321-2152 Vol:7
14	Advice on how to prepare a research paper in the field of engineering	Sateesh.K	Civil Engineering	International Journal of modern Electronics and Communication Engineering	2019	2321-2152 Vol:7

15	Advice on how to prepare a research paper in the field of engineering	Terli Naidu	Civil Engineering	International Journal of modern Electronics and Communication Engineering	2019	2321-2152 Vol:7
16	Performance Improvement For BLDC Motor By Using Fuzzy Controller Inference Systems.	V. Vykunta Rao	EEE	International Journal For Advanced Research in Science &Technology (IJARST)	2019	2457-0362,,Vol.9
17	Speed Control Of Brushless DC Motor Fed With Photo Voltaic System Employing Zeta Converter.	V.Vykunta Rao	Electrical and Electronics	International Journal for Recent Developments in Science & Technology	2019	2581-4575,Vol.3
18	Evaluating the Opportunity Costs of Labor Resource Wastage in Chins' Real Estate Brokerage	P. Prasad	Civil Engineering	International Journal of modern Electronics and Communication Engineering	2020	2321-2152 Vol:8
19	Evaluating the Opportunity Costs of Labor Resource Wastage in Chins' Real Estate Brokerage	UdayaBhanu V	Civil Engineering	International Journal of modern Electronics and Communication Engineering	2020	2321-2152 Vol:8
20	Evaluating the Opportunity Costs of Labor Resource Wastage in Chins' Real Estate Brokerage	Simhachalam N	Civil Engineering	International Journal of modern Electronics and Communication Engineering	2020	2321-2152 Vol:8
21	Evaluating the Opportunity Costs of Labor Resource Wastage in Chins' Real Estate Brokerage	Chakravarthi VK	Civil Engineering	International Journal of modern Electronics and Communication Engineering	2020	2321-2152 Vol:8
22	Under seismic loading, experimental investigation was conducted on the punching shear behavior of RC slab-column connections including shear slabs	Kandarpa Srinivas	Electronics Communicatio n & Engineering	International Journal of Basic & Applied Research	2020	2249-3352 Vol:10
23	Under seismic loading, experimental investigation was conducted on the punching shear behavior of RC slab-column connections including shear slabs	Dr Chitturi Venkatratnam	Electronics Communicatio n & Engineering	International Journal of Basic & Applied Research	2020	2249-3352 Vol:10

24	Under seismic loading, experimental investigation was conducted on the punching shear behavior of RC slab-column connections including shear slabs	G. Manmadhaleela	Electronics Communication & Engineering	International Journal of Basic & Applied Research	2020	2249-3352 Vol:10
25	Under seismic loading, experimental investigation was conducted on the punching shear behavior of RC slab-column connections including shear slabs	Kuna Vijay Krishna	Electronics Communication & Engineering	International Journal of Basic & Applied Research	2020	2249-3352 Vol:10
26	Effect of PVA Concentration on Structural, Morphological, Optical and Electrical Properties Of PVA Capped SnS Nanocrystalline Films Grown by Chemical Bath Deposition	P. Mohana Krishna	Electronics Communication & Engineering	International Journal of Basic & Applied Research	2020	2249-3352 Vol: 10
27	Effect of PVA Concentration on Structural, Morphological, Optical and Electrical Properties Of PVA Capped SnS Nanocrystalline Films Grown by Chemical Bath Deposition	V. Suryakala	Electronics Communication & Engineering	International Journal of Basic & Applied Research	2020	2249-3352 Vol: 10
28	Effect of PVA Concentration on Structural, Morphological, Optical and Electrical Properties Of PVA Capped SnS Nanocrystalline Films Grown by Chemical Bath Deposition	G. Rambabu	Electronics Communication & Engineering	International Journal of Basic & Applied Research	2020	2249-3352 Vol: 10
29	Effect of PVA Concentration on Structural, Morphological, Optical and Electrical Properties Of PVA Capped SnS Nanocrystalline Films Grown by Chemical Bath Deposition	D. Tirumala Rao	Electronics Communication & Engineering	International Journal of Basic & Applied Research	2020	2249-3352 Vol: 10
30	Modeling Of Load Frequency Control For A Hybrid Power Systemusing PID Controller	K.Seetaramma yya	Electrical and Electronics	International Journal of Engineering Research & Technology (IJERT)	2020	2278-0181, Vol.8

31	Experimental Investigation On Natural Convection Heat Transfer Augmentation With Vibration Effect By Using Water – Al2O3 Nanofluid	B.Sudhakara Rao	Mechanical Engineering	International Journal of scientific & Technology, Research	2020	2277-8616,Vol.9
32	Design And Manufacture Of 3D Model By Using ARTCAM	M.Ravikiran	Mechanical Engineering	International Journal for Innovative Engineering and Management Research	2020	2456-5083, Vol.9
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34	Experimental Investigation On Mechanical Properties Of FecoCrnimo High Entropy Alloy& B4 C Reinforced Al6061 Hybrid Mmcs.	Ravi Kiran Mudidana	Mechanical Engineering	Materials Today, Proceedings - Elsevier	2020	2214-7853 Vol 46
35	Experimental Investigation On Forced Convective Heat Transfer Enhancement Using Transformer Oil-AL2O3 Nano Fluid	M. Ravi Kiran	Mechanical Engineering	International Research Journal of Engineering and technology (IRJET)	2020	2395-0056 Vol 9
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37	Using grout diaphragm walls to improve the efficiency of isolated footing sitting on loose sand soil: an experimental study as well as quantitative research	Swetha S	Civil Engineering	International Journal of information Technology& Computer Engineering	2021	2347-3657 Vol:9
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41	Abu Dhabi National Company's Transformational Leadership,Its Purpose and Its Workers' Productivity on the Job	PatruniVenkateswararao	MBA	Journal of management & Entrepreneurship	2021	2229-5348 Vol. 10
42	Abu Dhabi National Company's Transformational Leadership,Its Purpose and Its Workers' Productivity on the Job	SuravarapuUmadevi	MBA	Journal of management & Entrepreneurship	2021	2229-5348 Vol. 10
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45	How OHM and Viscous Dissipation Interact with MHD Jeffery Nanofluid Flow The Effect of Magnetic Dipoles	Sampathirao Ambika	Electronics Communication & Engineering	International journal of Basic & Applied Research	2022	2249-3352 Vol:12
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53	Photocatalytic Effect Of Cuo Nano Structures Under Sun Light Irradiation For Environmental Application	SVC RamanaMurty Naidu	Mechanical Engineering	ZKG International	2022	2366-1313, Vol.7
54	Working from Home the COVID-19 Pandemic: pros and cons from a Czech Employee's Point of View	Dr. Kanchu Satyam	MBA	Journal of management & Entrepreneurship	2022	2229-5348 Vol. 11
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63	Effect Of Dwell Time On Fracture Load Of Friction Stir Spot Welded Dissimilar Metal Joints.	SVC RamanaMurty Naidu	Mechanical Engineering	Hindawi Journal of Nanomaterials	2022	Article ID 2788479
64	A Report On Heat Transfer Optimization Of Shell And Tube Heat Exchanger Using Different Fluids Using Through CFD Analysis	R. Vara Lakshmi	Mechanical Engineering	International Research Journal of Engineering and Techology	2022	2395-0072,Vol.10
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68	Optimization And Mechanical Characteristics of AA6061/Zirconia Nanocomposites Fabricated by Ultrasonic- Aided Stir Casting Method	SVC RamanaMurty Naidu	Mechanical Engineering	Hindawi Journal of nonmaterial's	2022	2453412
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The Role of Biomedical Engineering and Physical Therapy in the Management of Chronic Achilles Tendonitis in Athletes Chronic Illness

ARI KATHOTA UDAY KUMAR, G.M.ANITHA PRIYADHARSHINI, DARSI SYAM BABU, PATNAIKUNI SOWMYA KEERATHANA
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ABSTRACT

The purpose of this research is to determine whether or not athletes suffering from chronic Achilles tendinopathy may benefit from a combination of biomedical engineering and physical therapy. A simple random sample strategy was used to choose 15 athletes who had chronic Achilles tendinopathy. All participants had their pain levels assessed using a Numerical Rating Scale before to the exam. Following the pre-test, the subjects underwent four weeks of low-level laser therapy with eccentric exercises. Following this, they were measured again for pain and increased range of motion, just as they had been before the treatment. Research has shown that athletes suffering from chronic Achilles tendinopathy may find relief with the use of low-level laser therapy in conjunction with eccentric workouts.
Eccentric exercise, biomedical engineering, physiotherapy, chronic Achilles tendinopathy, discomfort, and low-level laser treatment are all used as keywords.

INTRODUCTION

There are a number of clinical symptoms associated with tendinopathy, a common musculoskeletal condition. Increased migration of neutrophil cells, peritendinous edema, localized pain, and stiffness are hallmarks of the acute phase of inflammation [1]. Biomedical engineering, sometimes known as medical engineering, is the application of engineering ideas and principles to the fields of biology and medicine with the aim of improving healthcare via diagnosis and treatment. This area, which has long been referred to as "bioengineering," aims to bridge the gap between engineering and medicine. One product in biomedical engineering that has been used in clinical practice for some time is low-level laser treatment (LLLT), which might be useful in managing tendinopathy [2]. Multiple randomized controlled studies have shown that eccentric exercises (EEs) may help in the treatment of tendinopathy and chronic tendinopathies [3] [4]. This research aims to determine the efficacy of biomedical engineering and physiotherapy in treating chronic achilles tendinopathy in athletes by means of low-level laser therapy and eccentric workouts.

MATERIALS AND METHODS

Fifteen athletes were chosen at random from the College of Physical Education at Vinayaka Mission in Salem using a simple random sample procedure that took inclusion and exclusion into

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Eccentric exercise, biomedical engineering, physiotherapy, chronic Achilles tendinopathy, discomfort, and low-level laser treatment are all used as keywords.

INTRODUCTION

There are a number of clinical symptoms associated with tendinopathy, a common musculoskeletal condition. Increased migration of neutrophil cells, peritendinous edema, localized pain, and stiffness are hallmarks of the acute phase of inflammation [1]. Biomedical engineering, sometimes known as medical engineering, is the application of engineering ideas and principles to the fields of biology and medicine with the aim of improving healthcare via diagnosis and treatment. This area, which has long been referred to as "bioengineering," aims to bridge the gap between engineering and medicine. One product in biomedical engineering that has been used in clinical practice for some time is low-level laser treatment (LLLT), which might be useful in managing tendinopathy [2]. Multiple randomized controlled studies have shown that eccentric exercises (EEs) may help in the treatment of tendinopathy and chronic tendinopathies [3] [4]. This research aims to determine the efficacy of biomedical engineering and physiotherapy in treating chronic achilles tendinopathy in athletes by means of low-level laser therapy and eccentric workouts.

MATERIALS AND METHODS

Fifteen athletes were chosen at random from the College of Physical Education at Vinayaka Mission in Salem using a simple random sample procedure that took inclusion and exclusion into

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Performance and Emission Characteristics of a V.C.R C.I Engine using Chicken Waste Based Bio-Diesel with Blended Fuels

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ABSTRACT

This project deals with the preparation of Oil (extraction of oil) from the chicken waste which is obtained from tri-glycerides through the transesterification process to find Performance and emission characteristics of V.C.R diesel engine with ratio 18:1 fuelled with rendered chicken oil with five different blends at speed 1500rpm. The chicken oil is prepared from waste chicken available at poultry form. The blends are made as B0, B5, B10, B15, B20, & B25. The performance characteristics like specific fuel Consumption, brake power, indicated power, brake thermal efficiency, indicated thermal efficiency and mechanical efficiency are evaluated and made comparison. This report explains the emission characteristics of all blended bio-fuels at different loads

Keywords: *Rendered chicken oil, V.C.R. C.I engine, Performance, Emissions.*

1. INTRODUCTION

Fuels derived from renewable biological resources for use in diesel engines are known as biodiesel. Biodiesel is environmentally friendly liquid fuel similar to petro-diesel in combustion properties. Increasing environmental concern, diminishing petroleum reserves and agriculture based countries are the driving forces to promote biodiesel as an alternate fuel. Vegetable oils and animal fat oils being renewable, non-toxic, biodegradable with low emission profiles are suitable alternative fuels to diesel. Biodiesel derived from vegetable oil and animal fats is being used to reduce air pollution and to reduce dependence on fossil fuel. Biodiesel can be harvested and sourced from chicken waste. Higher viscosity, lower volatility and polyunsaturated character of animal fat oils pose normal engine operational problems. Transesterification is the method of optimizing the characteristics of animal fat oils.

This thesis about conversion of oil from chicken waste in to biodiesel and performance test conducted on stationary single cylinder diesel engine by using chicken waste extracted oil blends with diesel fuel for no load to full load condition. These tests were also conducted with conventional diesel fuel for comparison.

2. PREPARATION AND PROPERTIES:

PRODUCTION OF BIO DIESEL: The chicken that is taken into a vessel boiled along with water and temperature maintained above 100 degree centigrade. After water evaporation the stock is squeezed to extract oil. The animal fat oil (chicken waste oil) is filtered to remove dirt, charred food, and other non-oil material often found in the oil. The catalyst is typically sodium hydroxide (caustic soda) or calcium oxide (lime). It is dissolved in the alcohol using a standard agitator or mixer. The alcohol/catalyst mix is then charged into a vessel and the oil is added. The system from here on is totally closed to the atmosphere to prevent the loss of alcohol. The reaction mix is kept just above the boiling point of the alcohol (around 160 °F) to speed up the reaction.

The triglyceride is reacted with alcohol in the presence of a catalyst, usually a strong alkali like sulfuric acid. The main reason for doing a titration to produce biodiesel, is to find out how much alkaline is

THERMAL ANALYSIS ENERGY PERFORMANCE AND PARAMETER IDENTIFICATION OF A STAINLESS STEEL ANNEALING FURNACE USING ANSYS

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Abstract-

Various types of furnaces are available for numerous heating applications and also several problems associated with their operations non uniform thermal conditions on the load ineffective heat transfer from heat sources to the load, difficulty in controlling atmosphere inside the furnace, high energy losses etc are some of the important problems in furnace operations. Heating power produced by radiant tubes and its temperature distribution of continuous annealing furnace were analyzed using Ansys. Here in this project I am modeling of heating zone of continous annealing furnace by using creo3.0 and simulating the furnace heating zone using Ansys15.0 The objective of my project is to improve the heating capability of radiant tubes. By varying parameters of radiant tube materials for corresponding emissivities are analyzed by using steady state thermal analysis in ANSYS. By this we how emissivity will effect the heat transfer in steel strip By validating results with temperature distribution and Heat flux.

I. INTRODUCTION

A furnace is a device used for high-temperature heating. The name derives from Latin word fornax, which means oven. The heat energy to fuel a furnace may be supplied directly by fuel combustion, by electricity such as the electric arc furnace, or through induction heating in induction furnaces.

1.1 CONSTRUCTION AND WORKING OF CONTINOUS ANNEALING FURNACE

Steel material hardens after cold rolling due to the dislocation tangling generated by plastic deformation. Annealing is therefore carried out to soften the material. The annealing

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Experimental Analysis of a VCR Engine Performance Using Neem Methyl Ester and its Diesel Blends

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***Abstract*: Bio diesel is an alternative fuel which is produced from edible or non-edible vegetable oil or animal fat. It is a best renewable substitute of conventional fuel. As a replacement of petroleum fuel it is much cleaner alternative. Its physical components are similar to regular diesel fuel. Experimental analysis of variable compression diesel engine performance and emission using Neem Methyl Ester Bio diesel (NeME),and pure Diesel at various load conditions at fixed compression ratio 17.5:1 to compare the result at each compression ratio considering pure diesel as base line. The experiment has been conducted at fixed engine speed of 1500 rpm and engine tests have been conducted to get the comparative measures of Specific Fuel Consumption (SFC), Brake thermal efficiency(BTh) and emission such as CO, CO_2, HC, and improved the emission characteristics.**

Keywords: biodiesel, neem methyl ester, variable compression ratio engine, emission, performance

I. Introduction

The limited availability and fast retreating resources of petroleum fuels, increasing day by day prices of crude oil, and environmental aspects are the reasons for the use of biodiesel obtained from vegetable oils as alternative to petro diesel. Methyl/Ethyl Esters of Vegetable oils offer almost the same output with slightly lower thermal efficiency when used in diesel engines. Reduction of tail pipe emissions plays a major role in the field of biodiesel application and also research aspect in engine development. The environmental protection and pollution norms of the application of biodiesel. The use of neat vegetable oils possess some problems when operated long run of the engines due to high viscosity, low volatility and poly-unsaturated character of vegetable oils.

The main problems are trumpet formation on the injectors, carbon deposits, oil ring sticking and thickening and gelling of lubricating oil as a result of contamination by the vegetable oils. In the present work, bio-diesel (Methyl Ester) is prepared from Neem oil. The fuel properties of the test bio-diesel were determined and their performance and emission were studied on a four-stroke, single cylinder, variable compression ratio direct-injection diesel engine to evaluate suitability as alternative to Diesel.

II. Equipment and Experiments

A. Bio diesel (Neem Methyl Ester)

The Pure diesel used in the Experimentation is obtained from nearest filling station. The biodiesel prepared from Neem oil by a method of alkaline catalysed transesterification. The lower calorific value of biodiesel is approximately 7 % lower than that of pure diesel. The viscosity of Neem methyl ester is evidently higher than the pure diesel. In the experimentation, four compression ratios are provided by the screw adjustment for the test engine starting 17.5:1 for pure diesel run at particular compression ratio. Transesterification of Neem oil was carried out by heating of oil, addition of KOH and methyl alcohol, stirring of mixture, separation of glycerol, washing with distilled water and heating for removal of water traces. The NeME so produced was used for the experimentation along with pure diesel at above said compression ratios for comparative study. Fuel properties such as flash point, fire point, kinematic viscosity and calorific value were determined for Neem methyl ester and are compared with the pure diesel.

III. Bio-Diesel Preparation

A. Two step acid base catalyzed transesterification

Crude neem oil when transesterified using NaOH catalyst produced a significant amount of soaps from saponification side reaction. This was due to the high level of free fatty acids and small quantity of moisture in the crude neem oil. Therefore, a twostep process acid catalyzed esterification followed by alkali catalyzed transesterification was employed according to the method of Berchmans and Hirata (2008) [3].

B. Acid pre-treatment (acid catalyzed esterification)

Fig. 1. Magnetic stirrer with the neem oil

The method of acid transesterification is listed below:

1) The crude neem oil of 200ml is taken
2) It is heated at 60°C for about 10 min and mixed with 60 ml of methanol

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Design and Structural Thermal Analysis of Gas Turbine Rotor Blade with Radial Holes using Solidworks

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ABSTRACT
Cooling of gas turbine blades are major attention to high temperature working conditions. Numerous methods have been recommended for the cooling of blades and a unique technique is to be used to ensure lial holes to pass high velocity cooling air along the blade span. The forced convection heat transfer from the blade to the cooling air, it will reduce the temperature of the blade to permissible limits. Finite element analysis is used in the present work to examine steady state thermal & structural performance for stainless steel. Four different models comprising of solid blade and blades with varying number of holes (7, 8, 9 & 10 holes) were evaluated in this project to find out the optimum number of cooling hole. It is observed that as the number of holes increases the temperature distribution will be increased consequently. The structural analysis is carried out after the thermal analysis in SOLID WORKS SIMULATION TOOL. It is observed that blade with 10 holes has showing more stresses than the remaining blades. Finally the blade with 9 holes has giving optimum performance for prescribed loading conditions with average temperature of 513.9 K, heat flux of 3.118 W/m2 at the trailing edge and von misses stresses as 17.67 MPa.

KEY WORDS: *Gas Turbine, Structural Analysis, Thermal Analysis, Modal, Finite Element Analysis*

I. INTRODUCTION
A turbine, from the Greek τύρβη, tyrbē, ("turbulence"), is a rotary mechanical device that extracts energy from a fluid flow and converts it into useful work. A turbine is a turbomachine with at least one moving part called a rotor assembly, which is a shaft or drum with blades attached. Moving fluid acts on the blades so that they move and impart rotational energy to the rotor. Early turbine examples are windmills and waterwheels.

Gas, steam, and water turbines usually have a casing around the blades that contains and controls the working fluid. Credit for invention of the steam turbine is given both to the British engineer Sir Charles Parsons (1854–1931), for invention of the reaction turbine and to Swedish engineer Gustaf de Laval (1845–1913), for invention of the impulse turbine. Modern steam turbines frequently employ both reaction and impulse in the same unit, typically varying the degree of reaction and impulse from the blade root to its periphery.

The word "turbine" was coined in 1822 by the French mining engineer Claude Burdin from the Latin turbo, or vortex, in a memoir, "Des turbines hydrauliquesou machines rotatoires à grandevitesse", which he submitted to the Académieroyale des sciences in Paris. Benoit Fourneyron, a former student of Claude Burdin, built the first practical water turbine

Operation theory:
A working fluid contains potential energy (pressure head) and kinetic energy (velocity head). The fluid may be compressible or incompressible. Several physical principles are employed by turbines to collect this energy:

Impulse turbines change the direction of flow of a high velocity fluid or gas jet. The resulting impulse spins the turbine and leaves the fluid flow with diminished kinetic energy. There is no pressure change of the fluid or gas in the turbine blades (the moving blades), as in the case of a steam or gas

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DESIGN AND ANALYSIS OF I.C ENGINE COMBUSTION CHAMBER USING CFD

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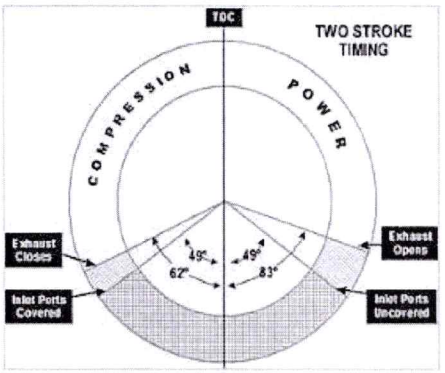
ABSTRACT: Internal combustion engines are seen each day in vehicles, vehicles, and buses. The name inner combustion refers additionally to gas turbines except that the name is generally carried out to reciprocating inner combustion (I.C.) engines like the ones observed in normal cars. There are basically styles of I.C. Ignition engines, those which need a spark plug, and those that rely upon compression of a liquid. Spark ignition engines take a mixture of fuel and air, compress it, and ignite it the use of a spark plug.

In this thesis, the combustion chamber is designed in line with the IC engine specs and analyzed for its heat switch price the use of Finite Element evaluation software ANSYS and calculate emissions . Modeling may be done in CREO parametric software. CFD analysis to determine the stress drop, speed and heat switch coefficient and to finding the emissions (O2, N2) of methane and ethane (mass fraction, mole fraction and mole concentration of methane and ethane).

INTRODUCTION

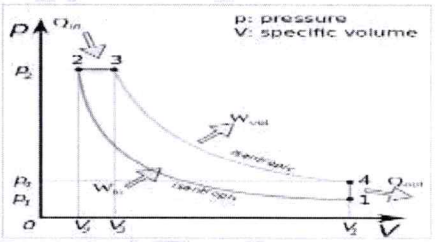
Diesel engines paintings by compressing most effective the air. The diesel inner combustion engine differs from the gasoline powered Otto cycle by the usage of fantastically compressed warm air to ignite the gas in place of the usage of a spark plug (compression ignition in place of spark ignition).



OPERATING PRINCIPLE

The diesel inner combustion engine differs from the fuel powered Otto cycle by the use of quite compressed warm air to ignite the gasoline in place of the use of a spark plug (compression ignition in place of spark ignition).

In the genuine diesel engine, only air is to start with delivered into the combustion chamber. The air is then compressed with a compression ratio commonly among 15:1 and 23:1. This excessive compression reasons the temperature of the air to upward push. At about the top of the compression stroke, fuel is injected at once into the compressed air in the combustion chamber. This can be right into a (generally toroidal) void within the top of the piston or a pre-chamber relying upon the layout of the engine. The gas injector guarantees that the gas is broken down into small droplets, and that the gas is distributed flippantly. The warmth of the compressed air vaporizes gas from the surface of the droplets.



MAJOR ADVANTAGES

Diesel engines have several advantages over other inner combustion engines:

- Diesel gasoline has higher electricity density and a smaller volume of gasoline is needed to carry out a specific amount of labor.
- Diesel engines inject the gasoline without delay into the combustion chamber, have no intake air restrictions apart from air filters and intake plumbing and haven't any consumption manifold vacuum to feature parasitic load and pumping losses as a consequence of the pistons being pulled downward towards intake machine vacuum. Cylinder filling with atmospheric air is aided and volumetric efficiency is elevated for the equal cause.
- Diesel fuel has better lubrication properties than petrol as well. Indeed, in unit injectors, the gasoline is employed for three distinct functions: injector lubrication, injector cooling and injection for combustion.

DESIGN AND ANALYSIS OF CIRCULATING FLUIDIZED BED (CFB) BOILER AT DIIFFERENT NANOFLUIDS

[1]Dokkara praveen kumar [2]Madanala Venkateshwara rao
[1]M.tech (student) thermal engineering, department of mechanical engineering Sri Venkateswara College Of Engineering And Technology
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ABSTRACT: The circulating fluidized bed (CFB) boiler is a member of the fluidized bed boiler family. It has gained popularity, especially in the electric power-generation market, for its several practical advantages, such as efficient operation and minimum effect on the environment.

Heavy industrialization & modernization of society demands in increasing of power cause to research & develop new technology & efficient utilization of existing power units. Variety of sources are available for power generation such as conventional sources like thermal, hydro, nuclear and renewable sources like wind, tidal, biomass, geothermal & solar.

In this thesis the CFBC boiler designed in CREO parametric software and analysis in ANSYS software at different temperatures (8500C & 9500C), velocities (6 & 10m/s) and NANO fluids (water as a base fluid) and NANO fluid al2o3 at volume fractions 0.2, 0.4.

In this project CFD analysis to determine mass flow rate , heat transfer rate, pressure drop and velocity at different velocities and different temperatures. Temperature analysis to determine the temperature distribution and heat flux at different materials.

INTRODUCTION

A boiler is a closed vessel in which water or other fluid is heated. The fluid does not necessarily boil. The heated or vaporized fluid exits the boiler for use in various processes or heating applications including water heating, central heating, boiler-based power generation, cooking, and sanitation.

'Getting rid of waste' was the ultimate goal when the fluidized bed combustion (FBC) technology was introduced This goal evolved over time to 'clean energy for the future'. Since its introduction in the 1970s the technology has gained acceptance in various industrial applications. FBC is a combustion technology used in power plants. FBC is known for its ability to burn low-grade fuels with low calorific value, high ash content and high moisture content. Fluidized beds suspend solid fuels on upward-blowing jets of air during the combustion process. The result is a turbulent mixing of gas and solids. When a fluidized bed is operated above the terminal velocity of the particles, they are carried out of the bed. The system of a circulating fluidized bed (CFB) occurs when the particles are separated from the fluid by the use of cyclones and are recycled to the bed. The part of the system where the carryover of solids transpires is normally referred to as the riser. It is known for its ability to burn low-grade fuels with low calorific value, high ash content and high moisture content. The fluidization process begins when a bed of inert material (usually sand), which is a solid granular particle, is suspended by a flow of air or gas (air). This flow is injected into the combustion chamber from the bottom and from the side. FBC boilers can burn fuels other than coal, and the lower temperatures of combustion (800 °C / 1500 °F) have other added benefits as well.

BOILER TYPES AND CLASSIFICATIONS:

There are two general types of boilers: "fire-tube" and "water-tube". Boilers are classified as "high-pressure" or "low-pressure" and "steam boiler" or "hot water boiler." Boilers that operate higher than 15 psig are called "high-pressure" boilers.A hot water boiler, strictly speaking, is not a boiler. It is a fuel-fired hot water heater. Because of its similarities in many ways to a steam boiler, the term "hot water boiler" is used.•Hotwater boilers that have temperatures above 250° Fahrenheit or pressures higher than 160 psig are called "high temperature hot water boilers".•Hotwater boilers that have temperatures not exceeding 250° Fahrenheit or pressures not exceeding 160 psig are called "low temperature hot water boiler"s.Heating boilers are also classified as to the method of manufacture, i.e., by casting (cast iron boilers) or fabrication (steel boilers). Those that are cast usually use iron, bronze, or brass in their construction. Those that are fabricated use steel, copper, or brass, with steel being the most common material.

Circulating Fluidized Bed combustion has given boiler and power plant operators a greater flexibility in burning a wide range of coal and other fuels. All this without compromising efficiency and with reduced pollution. How does the boiler work with this technology?In the olden days blacksmiths used to heat the iron by placing it on a bed of coal. Bellows provide air to the coal from the bottom of the bed. Fluidized Bed combustion is something similar to this.

Fluidized Bed

At the bottom of the boiler furnace there is a bed of inert material. Bed is where the coal or fuel spreads. Air supply is

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Advice on how to prepare a research paper in the field of engineering

Chakravarthi,V.K, Tammineni Sravan Kumar, Sateesh,K, Terli Naidu

ABSTRACT

Due in large part to engineering's more common reputation as a practical discipline revolving around experiments and measurements rather than a theoretical one, the discipline is not often associated with engaging language or literary style. The majority of engineering students would prefer not to spend their time doing research for term papers and instead focus on solving engineering problems using mathematical equations. However, engineering is primarily an academic field, and research plays a crucial role within it. part of the scholarly perspective on it. In a nutshell, good research paper writing skills are as important as strong mathematical problem-solving abilities for engineering students. I will do experiments. There are a lot of students who thrive in quantitative and lab-based disciplines, such as engineering, but struggle when it comes to writing. This makes it hard for them to write research papers. The good news is that we can follow some basic guidelines to produce an engaging and informative engineering research paper.

INTRODUCTION

Guide to write Engineering research Paper

• Begin researching early on; students who struggle with research paper writing often make the mistake of trying to fill in gaps in their knowledge as they go along. Firstly, it implies that you should have a thorough grasp of your subject before beginning, rather than waste time reviewing for each new piece of knowledge. Second, you'll waste time due to inefficiency and repetition as you rush to research as you write. Instead, you should get a head start on your research as soon as possible so you have plenty of time to read widely, evaluate what you read, and come up with your own thoughts based on what you find. You may improve the quality of your thoughts and get ready to write your paper more quickly and efficiently if you divide the research and writing processes.

Make use of just the most recent studies: You should rely on recent studies to back up your claims, while older papers might be useful in some instances for tracing the evolution of a concept. Staying up-to-date with the newest research in your profession is essential. Due to the dynamic nature of engineering, this is of utmost importance. When new knowledge and methods become available, the old ways of doing things might become irrelevant. It is important that your paper meets the best it can be, thus it's essential that you maintain a high level of current awareness to guarantee that your paper is state-of-the-art.

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Make use of just the most recent studies: You should rely on recent studies to back up your claims, while older papers might be useful in some instances for tracing the evolution of a concept. Staying up-to-date with the newest research in your profession is essential. Due to the dynamic nature of engineering, this is of utmost importance. When new knowledge and methods become available, the old ways of doing things might become irrelevant. It is important that your paper meets the best it can be, thus it's essential that you maintain a high level of current awareness to guarantee that your paper is state-of-the-art.

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Advice on how to prepare a research paper in the field of engineering

Chakravarthi,V.K, Tammineni Sravan Kumar, Sateesh,K, Terli Naidu

ABSTRACT

Due in large part to engineering's more common reputation as a practical discipline revolving around experiments and measurements rather than a theoretical one, the discipline is not often associated with engaging language or literary style. The majority of engineering students would prefer not to spend their time doing research for term papers and instead focus on solving engineering problems using mathematical equations. However, engineering is primarily an academic field, and research plays a crucial role within it. part of the scholarly perspective on it. In a nutshell, good research paper writing skills are as important as strong mathematical problem-solving abilities for engineering students. I will do experiments. There are a lot of students who thrive in quantitative and lab-based disciplines, such as engineering, but struggle when it comes to writing. This makes it hard for them to write research papers. The good news is that we can follow some basic guidelines to produce an engaging and informative engineering research paper.

INTRODUCTION

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PERFORMANCE IMPROVEMENT FOR BLDC MOTOR BY USING FUZZY CONTROLLER INFERENCE SYSTEMS

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ABSTRACT:

In this project Fuzzy Controller based control of BLDC motor is presented. Brushless DC motors (BLDC) find wide applications in industries due to their high power density and ease of control.To achieve desired level of performance the motor requires suitable speed controllers. The mathematical model of BLDC motor and a back propagation Adaptive Neuro-Fuzzy Inference Systems (Fuzzy Controller) algorithm are considered and included to replace the conventional method of Proportional Integral and Fuzzy. Fuzzy Controller it integrates both neural networks and fuzzy logic principles, it has potential to capture the benefits of both in a single framework. Its inference system corresponds to a set of fuzzy IF–THEN rules that have learning capability to approximate nonlinear functions. Hence, Fuzzy Controller is considered to be a universal estimator. The analysis of overshoot, rise time and steady state error for the speed range which indicates that the proposed adaptive neuro-fuzzy inference systems has successfully improved the performance of the BLDC motor drive. According to new proposed approach speed control of BLDC motor drive and analysis using adaptive Neuro-Fuzzy inference systems to carry off the weakness of fuzzy logic controller (Steady-state error).Further the Fuzzy Controller controller provides low torque ripples and high starting torque.The proposed Fuzzy Controller controller is evaluated by using MATLAB/SIMULINK software.

Keywords- Brushless DC motor (BLDCM), Fuzzy Logic Speed Controller (FLC), Hysteresis Current Controller (HCC), PI Speed Controller.

I. INTRODUCTION

The Permanent magnet brushless motors arecategorized into two types based upon the back EMFwaveform, brushless AC (BLAC) and brushless DC(BLDC) motors. BLDC motors are rapidly becomingpopular in industries such as Appliances, electrictraction, aircrafts, military equipment, hard disk drive, Industrial automation equipment, Instrumentation because of their high efficiency, high power factor, silent operation, compact, and reliability and low maintenance. BLDC motors have many advantages over DC motors and induction motors. [1-3]. Some of the advantages are better speed versus torque characteristics, high dynamic response, high efficiency, long operating life, noiseless operation, higher speed

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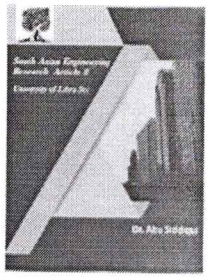

SPEED CONTROL OF BRUSHLESS DC MOTOR FED WITH PHOTO VOLTAIC SYSTEM EMPLOYING ZETA CONVERTER

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Abstract: This paper proposes a solar photovoltaic (SPV) array fed water pumping system utilizing a zeta converter as an intermediate DC-DC converter in order to extract the maximum available power from the SPV array. Controlling the zeta converter in an intelligent manner through the incremental conductance maximum power point tracking (INC-MPPT) algorithm offers the soft starting of the brushless DC (BLDC) motor employed to drive a centrifugal water pump coupled to its shaft. Soft starting i.e. the reduced current starting inhibits the harmful effect of the high starting current on the windings of the BLDC motor. A fundamental frequency switching of the voltage source inverter (VSI) is accomplished by the electronic commutation of the BLDC motor, thereby avoiding the VSI losses occurred owing to the high frequency switching. A new design approach for the low valued DC link capacitor of VSI is proposed. The proposed water pumping system is designed and modeled such that the performance is not affected even under the dynamic conditions. Suitability of the proposed system under dynamic conditions is demonstrated by the simulation results using MATLAB/Simulink software.

Key words:Brushless dc (BLDC) motor, incrementalconductance maximum power point tracking (INC-MPPT), solarphotovoltaic (SPV) array, voltage-source inverter (VSI), waterpump, zeta converter

I. Introduction

Severe environmental protection regulations, shortage offossil fuels and eternal energy from the sun have motivated theresearchers towards the solar photovoltaic (SPV) array generatedelectrical power for various applications [1]. Water pumping isreceiving wide attention nowadays amongst all the applicationsof SPV array. To enhance the efficiency of SPV array and hencethe whole system regardless of the operating conditions, itbecomes essential to operate SPV array at its maximum powerpoint by means of a maximum power point tracking (MPPT)algorithm [2-4]. Various DC-DC converters have been alreadyemployed to accomplish this action of MPPT. Nevertheless, a Zeta converter [5 -9] based MPPT is still unexplored in any kindof SPV array based

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Evaluating the Opportunity Costs of Labor Resource Wastage in China's Real Estate Brokerage

Chakravarthi,V.K, Udaya Bhanu.V, Simhachalam,N, Durga Prasad.K

ABSTRACT

Providing "an indispensable forum for the exchange of knowledge and experience between pro-fessionals from both academic and industrial environments" is the stated goal of the Bulletin of the Polish Academy of Sciences: Technical Sciences. Science and technology are tightly intertwined and very significant, especially in civil engineering. Prior to this one, in 2013 [1] and again in 2015 [2], there were two special sections published on civil engineering. In honor of the 70th anniversary of the Warsaw Building Research Institute (ITB), this special section on "Civil Engineering - Ongoing Technical Research" has been produced. The origins of such institutions may be traced to the middle of the nineteenth century, when they were established to investigate the characteristics of building materials used in mechanical constructions and the construction industry. They were founded in technological universities. It is worth noting that the earliest of these research units were established at the following universities of technology: Munich in 1870, Berlin in 1871, Vienne in 1873, Zurich in 1880, Lviv in 1884, and Warsaw in 1918. The Road Research institution of Warsaw University of Technology was the preeminent Polish construction research institution until 1939.

INTRODUCTION

The conference that was held in conjunction with the ITB anniversary, titled "The Strategy of Construction Research Institutes," offered a compilation of the information and plans of the building institutes that are shaping the construction industry in Europe. The Building Research Institute was established, according to ITB laws, to undertake extensive research into the development of better building and road materials, the enhancement of construction technology via the application of all scientific developments, and the rise of production of these materials. Obviously, it is not the exclusive responsibility of ITB to initiate changes in the field's trajectory. The term "ongoing" in the title of the section has been interpreted both literally and metaphorically in this context. The Special Section now contains all of the editorial civil engineering portfolio's current waiting papers. Part II of the Special Section will publish the articles that are currently being edited. Not only do we have a snapshot of the current publishing activity, but we also have the defining image of civil engineering in an instant if this is the case. Despite its seemingly haphazard creation, this painting is remarkably detailed.

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Under seismic loading, experimental investigation was conducted on the punching shear behavior of RC slab-column connections including shear slabs.

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ABSTRACT

The practicality of reinforced concrete flat slab-column constructions makes them commonly employed. Nevertheless, punching-shear failure in the slab-column connections is a real possibility in these kinds of buildings. The slab-column connection is vulnerable to brittle punching failure in the absence of shear reinforcement, particularly in seismic zones where lateral stress is common. A excellent kind of transverse reinforcement that prevents punching failure, shear studs are efficient. The purpose of this study is to investigate the usage of shear studs to enhance the ductility and punching shear capacity of inner slab-column connections subjected to both continuous vertical load and cyclic loading. The FP-GR-CTRL specimen was the only one tested vertically without cyclic loading; the others, FP-VR-0.4, FP-VR-0.6, FP-VR-0.8, FP-SS-0.4, FP-SS-0.6, and FP-SS-0.8, were tested consistently vertically with an increasing amount of reversed cyclic loading until punching shear failure was reached. Discussing how the shear studs affect the punching shear behavior is the primary goal. Lastly, the experimental outcomes are evaluated and contrasted with global standards like the European Union's EC2-2004 and the American Code ACI318-14. We provide some first findings based on these data.

KEYWORDS: Seismic loading, displacement control, punching shear, shear studs, interior slab-column connections, and the gravity shear ratio are all important concepts.

1. INTRODUCTION

An extremely common kind of reinforced concrete construction is the flat slab structure, which uses a flat plate and columns to support the slab rather than beams between the columns. This sort of structure's design and behavior are the focus of the investigation. Seismic zone slab-column connections' punching shear behavior is the main focus. Reduced building story height, ease of formwork setup, simplicity for utilities placement, and nice slab look are some of the reasons flat slab-column structural systems are popular. Nevertheless, brittle punching shear failure is a common problem for structures of this sort. Cracks will form within the slab near the column when the flat slab-column connections are loaded vertically with high loads. These fissures eventually reach the base of the slab after cutting through its thickness at an angle of twenty to forty-five degrees. As a result, the slab's fissures may experience punched shear failure. The slab-column connection is more prone to punching shear failure when exposed to seismic lateral loads because shear stresses in the slab rise as a result of an unbalanced force caused by horizontal cyclic loading.

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EFFECT OF PVA CONCENTRATION ON STRUCTURAL, MORPHOLOGICAL, OPTICAL AND ELECTRICAL PROPERTIES OF PVA CAPPED SnS NANOCRYSTALLINE FILMS GROWN BY CHEMICAL BATH DEPOSITION

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ABSTRACT
Chemical bath deposition (CBD), a straightforward and inexpensive wet chemical method, has been used to effectively produce nanocrystalline films of polyvinyl alcohol (PVA) capped tin monosulfide (SnS) on glass substrates. The concentrations of PVA used ranged from 0.5 wt % to 2 wt %. The XRD analysis showed that the SnS phase is best represented by peaks with an orientation of (040). The use of XRD spectra allowed for the estimation of many characteristics, including stacking faults, dislocation density, lattice strain, and average crystallite size. The XRD findings were further validated by Raman analysis. The films deposited at a 2 wt % concentration of PVA showed acceptable morphology in the SEM and AFM micrographs. FTIR analysis confirmed that the films contained PVA. The experimental films' high absorbing nature was corroborated by the optical examinations, which also revealed a blue shift in band gap values with increasing PVA concentration. As a result of the quantum confinement effect, the predicted band gap values range from 1.73 eV to 1.55 eV. All of the developed layers exhibited p-type conductivity, according to Hall measurement tests. We also talk about the findings from our study on the effects of different PVA concentrations on electrical resistivity, carrier concentration, and mobility.
Chemical Bath Deposition, Polyvinyl Alcohol, Structural Properties, Optical Properties, and Morphological Properties are the keywords here.

1. INTRODUCTION

2. Research into the creation of photovoltaic devices via the use of novel technology, materials, and methods has recently garnered a lot of interest due to the fact that these advancements result in decreased costs and improved efficiency. To create different types of semiconductor nanocrystalline layers for use in devices, one processing step is to use polymer matrices as a capping agent. It is possible to modify the physical behavior, especially the electrical and optical characteristics, by covering the layers of semiconductors with polymers. Solar cells, field effect transistors, electroluminescence devices, and light-emitting diodes all rely on their size and shape regulation capabilities, making them very important [1–5]. The particle size is reduced and the surface to volume ratio is increased by capping. Many scientists have come to trust polyvinyl alcohol (PVA) as a viable capping agent and have found it useful in nano production among other organic materials. This is mostly because of its many desirable properties, such as being chemically resistant, transparent throughout the visible spectrum, inexpensive, non-toxic, readily biodegradable, having a high viscosity, and being hydrophilic [6-8]. In addition, PVA does not cause lattice mismatch or flaws at the nanocrystal/capping matrix interface [9]. Several authors have previously shown that semiconductor nano crystals topped with PVA have improved physical

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Modeling of Load Frequency Control for A Hybrid Power System using PID Controller

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Abstract:-**Interconnected power system is plays one the of critical role in modern electrical power system Engineering.the power load demand varies randomly both area frequency and tie-line power interchange also vary. For interconnection of two or more areas in power system, frequency should be maintained within the scheduled value, which can be achieved by employing one of the most prominent techniques called as Automatic Load Frequency Control (ALFC). In ALFC, frequency can be controlled in three ways, namely Flat frequency regulation, Parallel frequency regulation and Flat tie-line loading. Among these controls, Parallel frequency regulation is commonly used method, because constant frequency can be maintained by equalizing the power generation with the power demand. The objectives of LFC are to minimize the deviations in these variables (area frequency and tie-line power interchange) and to ensure their steady state errors to be zero. In this area of energy crisis, renewable energy is the most promising solution to increasing energy needs. But the power production by these resources cannot be controlled unlike in thermal plants. As a result, standalone operation of renewable energy is not reliable. Hence grid-connection of these along with conventional plants is preferred due to the improved performance in response to dynamic load. In this paper a particle swarm optimization tuned Proportional Integral Derivative(PSOPID) controller has been proposed.Load frequency control including PID controller with PSO optimizing method is proposed in order to suppress frequency deviations for a power system involving wind, hydro and thermal plants owing to load and generating power fluctuations caused by penetration of renewable resources. The proposed system involving four thermal plants,wind farm and hydro plant will be modelled using MATLAB.**

Keywords: - Automatic Load Frequency Control (ALFC), Hybrid power systems (Thermal and hydro, wind power plant),PID controller

I. INTRODUCTION

Generally, power system consists of three parameters which shall be within the limits for successful operation i.e. Frequency, Voltage and Load angle, among these frequency parameter plays vital role. Many different power frequencies were used in the 19th century. Very early isolated ac generating schemes used arbitrary frequencies based on convenience for steam engine, water turbine and electrical generator design. Frequencies between 16⅔ Hz and 133⅓ Hz were used on different systems (1).The main purpose of a power engineer is to provide power to the consumers reliably and economically with a better quality. Frequency and tie-line power should be kept within the limits by equalizing the power generation at the generating end and the power consumption at the load end, because there are two points available throughout the power system for keeping the frequency within the limits, one is at the generating end and the other is at the load end [2].

LPF problem arises when individual generation areas are interconnected by transmission lines called as tie-lines.Large-scale power systems are liable to performance deterioration due to the presence of sudden small load perturbation parameter uncertainties, structural variations, etc. Frequency deviation is undesirable because most of the AC motors run at speeds that are directly related to frequency (3), Thus it is imperative to maintain system frequency constant. This is done by implementing Load Frequency Control (LFC). There are many LFC methods developed for controlling frequency. They include flat frequency control (FFC), tie-line bias control (TBC) and flat tie-line control (FTC). In FFC, some areas act as load change absorbers and others as base load (4). The thermal areas have been modelled using transfer function. Speed governor, turbine and generator constitute the various parts namely the speed governing system, turbine model, generator load models (5).The Particle swarm optimization are tuned Proportional Integral Derivative (PSOPID) controller has been proposed.the proposed controller has been compared with the other classical controllers under different loading conditions(6-8).The main performance PID controller tuned with Particle swarm algorithm was better than classical controller in terms of transient stability. It is observed that fluctuations in frequency caused due to load variations are low with increase in penetration of renewable resources (9).The Load frequency control(LPF) including PSO-PID controller is proposed in order to suppress the frequency deviations for a power system involving wind, hydro and thermal plants owing to load and generating power fluctuations caused by penetration of renewable resources. A system involving four thermal plants, a wind farm and a hydro plant will be modelled using MATLAB simulation (10).

II.MODELING OF SINGLE AREA (THERMAL AREA) :

2.1 Mathematical model of Speed Governing System of Power System:

the mathematical model of speed governing system has command signal ΔPC initiates a sequence of events-the pilot valve moves upwards, high pressure oil flows on to the top of the main piston moving it downwards; the steam valve opening consequently increases, the turbine generator speed increases, i.e. the frequency goes up which is modelled mathematically (9)

Experimental Investigation On Natural Convection Heat Transfer Augmentation With Vibration Effect By Using Water-Al_2O_3 Nanofluid

B.SUDHAKARA RAO, S.RAVI BABU

ABSTRACT: Conventional fluids including water, engine oil, ethylene, ethylene glycol, and transformer oil have a lower thermal conductivity of fluid compared to strong. The nanofluid is used in different applications like commercial, heat exchange, motor car, and biomedical, etc. The nanoparticles and sodium dodecyl sulfate are mixed into a base fluid (water) for distinct volume fractions (0.05%, 0.1%, 0.15%, and 0.2%) and supply diverse heat inputs 30W, 40W, 50W, 60W. The Al_2O_3 nanoparticles are high thermal conductivity then Cuo. The SDS (sodium dodecyl sulfate) mixed with Al_2O_3 nanoparticles are suspension kingdom for a long time without settling at the lowest allocation of the square rectangular prismatic enclosure. The unbalanced motor positioned below the cylindrical surface then its floor is vibrated and its temperature increases. The dimmer stat used to various voltages and frequency 100Hz-190Hz. The fluid at constant in enters gadget then enhancement of heat transfer coefficient increase.

Keyword: Natural convection, Heat transfer, Constant heat flux, Boundary theory layer, Vibration, Frequency.

I. INTRODUCTION

The metallic oxides are Al_2O_3 are nano-sized debris 50-80nm, sodium dodecyl sulfate and base fluid of water blended into glass breaker via the usage of the magnetic stirrer technique in 1 hour without settle within the bottom part of the enclosure but sodium dodecyl sulfate is used to surface is corrosion. The cylindrical floor temperature measured an axial distance of boundary layer thickness because the lowest part of a boundary layer is less will temperature increase and above in advance will temperature decreases that component due to the fact boundary layer thickness is greater. The two strategies used for without vibration impact and with vibration impact on a cylindrical floor. The vibratory motor placed beneath the desk and its accelerometer used to measure the vibrating alerts to the enhancement of warmth transfer fee will increase. Better to its temperature increases with vibration impact.

II. EXPERIMENTAL SETUP

The experimental setup includes a galvanized cylindrical container and inside a rectangular enclosure and it located inside the brass vertical heater. A vibrator (single-phase vibrator) became bolted at the rigid helping body and it's tightly. The outer galvanized iron cylindrical field consists of L*H*D (265mm*350mm*258mm) and its cylinder fixed at each end became carried on brackets installed at the vibrating strip and receiving vibrations via it. The inner aluminium square enclosure includes l*b (120mm*120mm) and t*h (4mm*300mm) respectively.

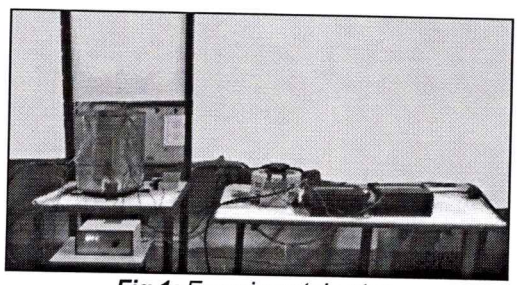

Fig 1: Experimental setup

The cylindrical heater road covered with brass fabric consists of D*l (18.5mm*250mm) and its floor located on Eight K-type thermocouples and its each thermocouple distance is 33.3mm. The 6 point temperature indicator connected to the six K-type thermocouples (data received system) and its temperature recorded. A 3 core cable linked vibrator to dimmer stat and its frequency or amplitude tiers growth to decrease. An accelerometer was used to pick out up a vibration sign from the cylinder and transmit the same to a vibration meter that could measure amplitude, pace or acceleration.

Volume fraction $\% = (\frac{mn}{\rho n})/(\frac{mn}{\rho n} + \frac{mf}{\rho f})$

Density of nano-fluid $\rho_{nf} = \phi\rho_p + (1-\phi)\,\rho_f$ Specific heat $Cp_{nf} = (1-\phi)(\rho C_p)_f + \phi(\rho C_p)_p$

Dynamic viscosity $\mu_{nf} = \mu_f(1 + 2.5\,\phi$

Thermal conductivity

$$K_{nf} = \frac{K_p + 2K_f + 2(K_p - 2K_f)\,\phi}{K_p + 2K_f - (K_p - 2K_f)\,\phi} \cdot K_f$$

Rayleigh number $Ra_L = Gr.\,Pr = g\beta l^3\Delta T/v^{2\cdot}\,\mu c_{p/k}$

Nusselt number $Nu = 0.287\,(Ra_L)^{0.287}$

III. EXPERIMENTAL WORK

Two-step techniques are employed to produce the alumina nanofluid. Alpha-Al_2O_3 nanoparticles (99.5% Virtue) had been obtaining from nano labs, India and the producer stated that the purchased alumina particles with not unusual length 50-80nm had been having a specific floor area15-20 m^2/g, bulk density of 3.95-4.1 g/cm^3. Al_2O_3 nanoparticles have been diffuse into the demineralised

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DESIGN AND MANUFACTURE OF 3D MODEL BY USING ARTCAM

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Abstract: In India most of the art models on wood are made by hand. The making of the art models manually results in inaccuracy of work (in most cases) as it depends on worker's ability and it would be difficult to work on mass production. The use of CNC for this purpose is limited only to some areas that to with no advancements in custom design and machining process. The use of the latest technology and designing advancements would bring an effective and efficient change in the art working industry. In this regard, an attempt is made to develop a customized high relief 3D art model from a 2D image using CAD/CAM application (Autodesk ArtCAM Premium 2008). Various modelling tools like vector tools, relief tools, texting tools, editing tools, layers, etc are learned and practiced. G/M codes are subsequently developed using suitable tools and optimum machining parameters defined from literature. To verify the intricate features a low relief model is developed first and machining test is performed over Medium Density Fibre (MDF) board using finish cut machining.

Key word: ArtCAM, CNC router, MDF.

I. Introduction of wood curving

Wood carving is a form of woodworking by means of a cutting tool manually or computer aided, resulting in a wooden figure or figurine, or in the sculptural ornamentation of a wooden object. The phrase may also refer to the finished product, from individual sculptures to hand-worked mouldings composing part of a tracery.One of the oldest types of art, woodcarving is a fine art normal to all societies, from the Stone Age onwards, not least on account of its far reaching accessibility, versatility and ease. Its solitary genuine disadvantage as a model for mold is its perishability. Being water retentive and helpless against creepy crawlies and airborne growths, wood can debase quickly.

TYPES OF WOOD CARVINGS

Chip carving: Chip cutting or chip-cutting, is a style of cutting wherein blades or etches are utilized to expel little chips of the material from a level surface in a single piece.

Relief carving: Relief cutting is a kind of wood cutting in which figures are cut in a level board of wood. The figures venture just marginally from the foundation as opposed to standing unreservedly. Contingent upon the level of projection, reliefs may likewise be delegated high or

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A CFD Based Thermal Analysis of Solar Air Heater Duct Artificially Roughened With 'S' Shape Ribs on Absorber Plate

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ABSTRACT: In the present work performance of solar air heater duct provided with artificial roughness in the form of 'S' shaped ribs geometry has been analyzed using CFD. The main objective is to increase the heat transfer rate by providing artificial roughness over the absorber plate. The effect of 'S' shaped ribs geometry on Nusselt number, friction factor and performance enhancement are investigated for relevant Reynolds number ranging from 6000-18000. Different turbulent models have been used for solving the problem and the results are then compared with Dittus-Boelter equation. Renormalization-group (RNG) k-ε model-based results have been found in good agreement with Dittus – Boelter equation and accordingly this model is used to predict heat transfer and friction factor in the duct. It has been observed that with a uniform heat flux of 1000 W/m^2 the maximum thermo-hydraulic performance ratio is found to be 1.48 at a particular Reynolds number.

KEYWORDS: CFD Analysis, Solar Air Heater Duct,Artificial Roughness, Absorber Plate, Reynolds number, thermo-hydraulic performance.

I. INTRODUCTION& LITERATURE SURVEY

In the environment, huge amount of solar energy is present which can be used as an energy resource. So, for the society, the utilization of solar air heater has become one of the most important topics for the research field. In the thermal system, solar air heater is extensively utilized for the purpose of heating like space heating, winter home heating, drying of crops, seasoning of timber etc. Since it works as heat exchanger where heat is transfer from absorber plate to air and the convective heat transfer coefficient between the air and absorber plate is quite low due to that thermal performance of solar air heater is low. So, it is need to improve heat transfer in the duct. There is lots of techniques are available to increase heat transfer. But among them, one of the easiest ways to increase performance of solar air heater by providing artificial roughness on absorber plate. In the absorber plate by providing protrusions, fixing ribs and different type of shape can make it rough. Whereas ribs on absorber plate as an artificial roughness can disturb the laminar sub layer and produce turbulence in the flow of air which can help to enhance the performance of solar air heater. This arrangement also increases the pumping power requirement of air because of increase in friction in the duct. Lots of experiment has conducted to analyses the consequences of providing artificial roughness in absorber plate for the heat transfer and the flow characteristic.

Bhushan and Singh [1] have analyses that solar air heater has very low thermal efficiency because of low thermal conductivity but its construction and utilization is very easy. Kumar et al [2] investigated that laminar sub layer form in the region of heat transferring surface, cause very low thermal conductivity and need to provide artificial roughness so that it can break laminar sub layer in the region of heat transferring surface so that heat transfer coefficient get improved. Varun et al [3] investigated that to improve heat transfer, many researchers have provided ribs, fins, wire mesh, baffles and different type of shape on the absorber plate as an artificial roughness but along with improve in heat transfer coefficient, friction factor also increased due to that pumping power of air get increased. Prasad and Saini [4] present a paper having protrusion as the shape of small diameter wires on the absorber plate and investigate that for similar roughness geometry get similar effect on thermal performance as well as heat transfer and friction factor. Saini and Verma [5] present experimental analysis on Nusselt number and friction factor characteristic of solar air heater duct having artificial roughness as dimple shaped geometry on absorber plate. They concluded that at a relative roughness height of 0.039 and relative roughness pitch of 10 gets maximum value of Nusselt number. They also evaluate friction factor of minimum value at relative roughness height of 0.0289 and relative

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Experimental investigation on mechanical properties of FeCoCrNiMo High Entropy Alloy & B_4C reinforced Al6061 hybrid MMCs

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ABSTRACT

Metal matrix composites are the new innovating materials used in daily life for quite some time. In the current research work Al6061 is used as matrix material and FeCoCrNiMo High Entropy Alloy (HEA) and Boron Carbide (B_4C) used as reinforcements. An attempt has been taken to fabricate hybrid MMCs considering aforementioned matrix and reinforcements through manual stir casting method by varying the volumetric concentrations (1%, 2% & 3%) of reinforcements. After fabrication, combined effects of HEA and B_4C reinforcements on mechanical properties (tensile strength, hardness and impact strength) of MMCs have been studied. The results indicate that hybrid composite samples show superior mechanical properties compared to pure Al6061. Mechanical properties are improved with increased vol% of FeCoCrNiMo High Entropy Alloy. The maximum 29%, 11.8% & 25.3% improvement in ultimate tensile strength, toughness & hardness were observed with Al6061 + 3%HEA + 1%B_4C hybrid composite sample compared to pure Al6061.

Selection and peer-review under responsibility of the scientific committee of the 2nd International Conference on Manufacturing Material Science and Engineering.

1. Introduction

Metal Matrix Composites (MMCs) plays a vital role in all the sectors like automotive, aircraft, defence, marine and ship buildings etc. Nowadays, researches are focusing towards improving the mechanical properties of metal matrix composites, by taking more than one type of reinforcements (hybrid composites) and new innovative reinforcements. Following research work have been performed on metal matrix composites; Mishra et al. [1] synthesized AlCrFeMnNiTi High Entropy Alloy (HEA) and observed improvement in magnetic properties due to addition of Al and Mn. The results also indicate that Annealed AlCrFeMnNiTi HEA shows good corrosion resistance. Brocq et al. [2] studied mechanical properties of CoCrFeMnNi HEA and reported significant improvement in hardness by preparing HEA through milling and spark plasma sintering process compared to conventional process (melting and casting). Nene et al. [3] reported the improvement in mechanical and corrosion properties of Cu-HEA because of controlled transformation of gamma matrix and twinning. Miracle et al. [4] developed a strategy to design and evaluate HEA's for structural use in automobile and industrial applications. Yan et al. [5] reviewed high entropy films and discussed about various preparation methods, composite design, phase structures and properties. The results indicate that HEA's shown enhanced mechanical properties, high temperature performance, good wear and corrosion resistance. Alshataif et al. [6] studied various manufacturing methods such as SSP, LSP & TFD methods and observed microstructural and mechanical properties of HEA's. Chen et al. [7] fabricated AlCoNiCrFe HEA reinforced Cu matrix composites with varying wt.% (10 & 20 wt%) and noticed that yield strength of Cu matrix composite is closer to Voigt model. Kumar et al. [8] fabricated HEA reinforced AA2024 composites through stir casting process with varying weight fractions (5- 15 wt%). Their results indicate that hardness, yield strength, tensile strength and modulus strength increases with increased weight fractions of reinforcement. Using reinforcement, maximum 62% enhancement in hardness has been observed compared to AA2024 matrix. Karthik et al. [9] experimentally investigated the newly fabricated CoCrFeNi HEA reinforced AA5083 composite at 12 vol% and noticed improvement in tensile and compressive strengths. Prakash et al. [10] fabricated AlCoCrCuFe HEA reinforced Al matrix composites with varying weight fractions (0–15 wt%) and observed maximum

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Experimental Investigation on Forced Convective Heat Transfer Enhancement Using Transformer Oil-Al_2O_3Nano Fluid

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Abstract - *Natural convective heat transfer along a vertical cylinder immersed in transformer oil–Al_2O_3 nanofluids for various concentrations (0, 0.05, 0.1, 0.15, 0.2vol %) under constant heat flux condition was investigated experimentally and presented. Thermal stratification was observed outside the boundary layer in the ambient fluid after steady-state condition is achieved as the fluid temperature goes on increasing along the axial direction. Temperature deviations of the cylinder along the axial direction and temperature variations of fluid in radial direction are shown graphically. It is observed that the temperatures of the cylinder and the fluid increases along the axial direction and the fluid temperature decreases in the radial direction. Experiments were conducted for various heat inputs (30 W, 40 W, 45 W and 50 W) and volume concentrations and observed that the addition of titanium oxide nanoparticles up to 0.15 vol % enhances the thermal performance and then the further addition of nanoparticles leads to deterioration. The maximum enhancement in the natural convection heat transfer performance is observed as 19.8%, i.e., heat transfer coefficient is increased from 314.172 w/m^2k to 614.465 w/m^2k at 0.15vol %.*

Key Words: **Forced Convection, Heat Transfer, Constant Heat Flux, Thermal Stratification, Transformer Oil-Al_2O_3, Nanofluids**

1. INTRODUCTION

Conventional heat transfer fluids such as water, engine oil, kerosene, ethanol, transformer oil, ethylene glycol have lower thermal conductivity compared to solids. Lower thermal conductivity of fluid became an obstacle to use in different applications. To overcome this obstacle, a new method such as dispersing Nano sized solid particles in the base fluids, which enhance the thermal conductivity of the base fluids significantly and it is named as Nano fluids. It is a challenge to remove heat efficiently from fast moving devices such as computers, power electronics, automobile engines, refrigerators, air conditions, etc. But in Earlier, researchers dispersed the micro-sized metallic particles (or) Nano particles into the base fluids to enhance the thermal properties of the base fluids but it has many drawbacks such as poor stability, erosion of the equipment, moderate enhancement. Choi et..al [1] Dispersed the nano-sized metallic particles of less than 100 nm size into the base fluid and prepared the nanofluids for the first time and observed the improvement in the thermal performance of it. Buoyancy-induced free convective heat transfer got much interest these days in engineering applications such as electronic cooling, heat ventilation and air conditioning, vapour absorption refrigeration, and nuclear reactor moderation. In order to increase the heat transfer performance of the fluid, nanoparticles in little quantity will be added to the carrier fluid. In various past researches [2–9], Nanofluids consisting of such particles suspended in liquids (typically conventional heat transfer liquids) have been shown to enhance the thermal conductivity and convective heat transfer performance of the base liquids.The thermal conductivities of the particle materials are typically an order-of-magnitude higher than those of the base fluids such as water, ethylene glycol, and light oils, and nanofluids, even at low volume concentrations, resulting in significant increases in thermal performance. Nnanna[10] experimentally investigated the natural convection heat transfer behavior of Al2O3/water nanofluids with various volume fractions ranging from 0 to 8%. In their study, test cell is a 2D rectangular enclosure with heated vertical and cooled horizontal adiabatic walls and performed the steady- state and unsteady-state analysis and observed that trend of temperature profiles is similar for base fluid and nanofluid and also observed the heat transfer enhancement for the smaller volume fractions0.2% ≤ Ø ≤ 2% and the deterioration in the performance at higher volume fractions Ø>2%. Masuda et.al [11] studied the thermo physical properties of the metallic oxide particles (Al2O3 and TiO2) dispersed in water. The transient hot-wire method was used for measuring the thermal conductivity of nanofluids. They reported that the thermal conductivity of nanofluids was significantly larger than the base liquid. For example, the thermal conductivity of Al2O3-water nanofluids and TiO2- water nanofluids at a 4.3vol% were approximately32% and11% higher than that of base liquid, respectively. Wen and Ding [12], Dongsheng [13] formulated the water-based TiO2 nanofluids by dispersing the nanoparticles in de-ionized water and got the stable suspension with the help of high shear homogenizer and they tested it in the horizontal cylindrical enclosure for determining the natural convective heat transfer at various heat inputs and observed the deterioration in the heat transfer performance in case of nanofluids. Prasad et.al [14] experimentally investigated the natural convection heat transfer

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Using grout diaphragm walls to improve the efficiency of isolated footing sitting on loose sand soil: an experimental study as well as quantitative research

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Abstract

Foundations often encounter heightened demands due to increasing loads from many sources, such as extra storeys, eccentric loads, and greater living loads. This is why it is now standard practice to place horizontal reinforcements under footings in order to increase the bearing capacity of loose-dense sand subgrades. Both the vertical settlement and the horizontal movement of the soil beneath the selected loaded footing may be mitigated by grouting the perimeter of the footing. This research aims to evaluate the effectiveness of a circular foundation sitting on granular soil injected with grout diaphragm walls by conducting comprehensive experimental work on twenty-one (21) soil models. In particular, the relation between the width (b) and length (L) of grouted walls and the bearing capacity of granular soil was examined in this work. According to the findings, a great way to increase the subgrade layer's bearing capacity is to construct grouted wall injection on each side of the current footing. In order to verify the accuracy of the selected computational procedures, two programs were utilized: the 3D PLAXIS program and the 2D Finite Element Program GeoStudio 2018. A circular foundation lying on granular soil has its bearing capacity significantly affected by reinforcement, according to the results, which is in agreement with the experimental observations.

Keywords Grout, Bearing capacity, Settlement, Circular footing, Improved soil.

Introduction

Soil stabilization is an increasingly common method forstabilizing soft soils in to meet the necessary engineering specifications and characteristics. This allows for the safe installation of buildings without experiencing significant settlements. Among various ground improvement meth-ods, grouting stands out as an effective solution for stabi- lizing soft soil. The treated soil has lower compressibility decreased hydraulic conductivity, and enhanced strength than the original soil (Kazemain & Barghchi, 2012). In tunnel construction, challenges like water gush-ing and collapses are common occurrences. Grouting reinforcement emerges as a crucial technology utilized to such issues. Ding et al. (2020) introduced research todevelop a model for grouting diffusion under continu- ous pressure control. As roughness increased, there wasa decrease in both the maximum diffusion distance and grouting diffusion velocity.

In soft soils, grouting treatment is a common and effi- cient way to reduce excessive cross section deformation of tunnel lining rings. A field experiment investigatingthe application of grouting treatment in an operating shield metro tunnel was conducted. The wide range of monitoring techniques and diverse geometric arrange- ments utilized in the experiment enable thorough com- parisons between the theoretical results and the field monitoring records. The results indicate that increas- ing the grouting's effect on the tunnel's convergence recovery can be achieved by increasing both its heightand volume.

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Abu Dhabi National Company's Transformational Leadership, Its Purpose, and Its Workers' Productivity on the Job

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Abstract

Using Abu Dhabi National Oil Company as a case study, this research aims to analyze the link between transformational leadership behaviors and the work performance of the employees. We used a quantitative method since it was what the study goal called for. A total of 450 managers from ADNOC were randomly chosen to participate in this research, which employed an explanatory correlational design. It was found that the structural models and measurements were valid and reliable. Therefore, the assumptions were tested using Partial Least Squares Structural Equation Modeling. According to the findings, the link between leadership behavior and workers' job performance was significantly mediated by the organization's goal. The results also showed that performance on the job was much improved by transformational leadership. Mission accomplished! Transformational leadership made all the difference. Similarly, mission significantly improved performance on the job. The findings contribute to the existing research by identifying potential elements that enhance workers' efficiency on the job. There were also comments and recommendations for further study.

Keywords: Mission, Transformational Leadership, Job performance, Abu Dhabi National Oil Company.

Introduction

The literature on leadership and management has devoted a great deal of space to the topic of job performance. A number of studies (Al-Tit, 2017; Boon et al., 2012; Diamantidis and Chatzoglou, 2019; Pandey, 2019; Zhang) have shown several organizational elements that influence employee performance. Searching the Scopus database for "organizational factors affecting job performance" yielded 133 research articles. Additional filtering of the search results to exclude any non-empirical research yielded 88 total papers. In addition, the researcher narrowed the search results to just 70 papers by include only those published between 2008 and 2019.

Along these lines, performance is behavior, according to Campbell et al. (1993). A worker does this task, and it is completely different from the results. He elaborated by saying that results are a person's work. Consequently, results and an employee's productivity are defined by performance. Job performance, according to Campbell et al. (1993), must be goal-relevant, meaning it should be focused on the organization's objectives that are pertinent to the work at hand. It is not new to find a correlation between effective leadership and productive employees. How leadership impacts organizational results is a topic that

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Enhancement of heat transfer rate using CuO (Copper Oxide) nanofluid in heat exchanger

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Abstract
Energy conservation, conversion, and recovery are vital thinking among people due to environmental issues. The effectively way to save energy of materials and facilities in which heat exchanger plays a significant role. Mostly in industries uses heat exchangers for enchantment of heat transfer. The commonly used heat transfer fluids are water, ethylene glycol and propylene glycol as base fluids in heat exchanger. Dispersion of Nano particles in a base fluid shows solution in problems such as high-pressure loss, erosion of material. The thermal conductivity of the base fluid increase by adding Nano particle which in turn increase the heat transfer rate. In this paper heat exchanger performance is analyzed by adding Copper oxide with base fluid (a mixture of Distilled water and propylene glycol). The thermal property i.e., overall heat transfer coefficient of heat exchanger is calculated and compared with base fluid. Experiments were conducted for various volume concentration 0.1%,0.3% and 0.5% and observed that the addition of Copper oxide nanoparticles enhances the thermal performance. The maximum enhancement in the convective heat transfer is observed at 0.5% volume concentration.

Keywords: *Heat transfer rate, Shell and tube heat exchanger, Copper oxide nano particle, Nusslet Number*

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I. INTRODUCTION

Power saving practices and concept of miniaturization of the heat transfer systems motivate many investigators to focus on enhancing the performance of Heat exchanger equipment. The thermal conductivity Enhanced in Traditional heat transfer fluid like Water, refrigerants, engine oil, glycols etc. compare to metal and also with the metal oxides in the fluid medium Traditional fluids affecting the thermal conductivity due to the size of solid particles. The application of nanoparticles as additives to liquids is more noticeable and currently a large number of researchers are devoted to this subject. Nano particle with size less than 100nm & volume concentration of 0-5% which are stable with very less particle settling, erosion, clogging. Traditional fluids with nanoparticles suspended in them are called nanofluids. Nanofluids have interesting properties such as large specific surface area, higher thermal conductivity, lesser erosion and longer-term stability, thus making them potentially important as heat transfer fluids in heat exchangers, nuclear reactors, electronic cooling, fuel cells, pharmaceutical processes, food industry

1.1 Shell and Tube Exchanger

Heat Exchanger is a device which heat transfer take place two to fluids in solid surface. These heat exchanger uses at many applications like power plants, air conditioning, chemical process etc. Gives higher thermal efficiency in the system. In shell and tube exchanger which provide a large ratio of heat transfer area to volume and weight. The main role of shell and tube heat exchanger is to transfer of heat at large rate. The estimation of the minimum heat transfer area required for a given heat as it governs the overall cost of heat exchanger is the primary objective of any heat exchanger design. The baffles are used in shell and tube exchanger to improve mixing which forces from shell side going in a zigzag manner which improves the heat transfer and avoiding vibration of the tubes. In the shell and tube heat exchanger, the thermal capability of base fluid must be increase to enhance the thermal efficiency. Adding a little amount of high thermal conductivity nano particles in base fluid improving the thermal conductivity. The Heat transfer enhancement depends on type, size, concentration of nano particles in a base fluid.

For preparing copper oxide nano fluids two step method is used. The mixture is composed of CuO (Copper oxide) nano particle is dispersed in the Propylene glycol in the corresponding volume concentration of 0.1%,0.3%,0.5% are prepared. The nano particle was slowly added to the base fluid in process of stirring. After

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How OHM and Viscous Dissipation Interact with MHD Jeffery Nanofluid Flow The Effect of Magnetic Dipoles

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ABSTRACT

A numerical investigation of a nanofluid called Jeffrey is carried out across a stretched sheet in the presence of a magnetic dipole effect, as well as the combined effects of viscous dissipation and ohmic heating. The original set of governing equations is simplified to a system of linked non-linear ordinary differential equations with appropriate boundary conditions by using the similarity transformation. By using the shooting and MATLAB bvp4c methods, the resultant equations are numerically solved. Previous research has explored the influence of several dimensionless factors on fluid velocity, temperature, and concentration, and these effects have been confirmed with a few limiting examples. For a variety of parameter values, we tabulate and analyze the skin friction coefficient and the local nusselts number numerically. The following terms are essential: Ohmic Heating, Jeffrey Nano Fluid, Viscous Dissipation, and Stretching Sheet.

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In subsequent years, several researchers have examined stretched sheet flow in relation to other non-Newtonian fluids, as well as rotation, velocity, thermal slip conditions, heat and mass transfer, chemical reactions, MHD, suction/injection, and other non-Newtonian fluids. the numbers3,4,5,6,7,8,9,10, and 11 Nanoparticles, which are particles smaller than a nanometer, are contained in a fluid known as a nanofluid. These substances are synthetic nanoparticle suspensions in a base fluid.[12]Heat exchangers, electronic cooling systems (such flat plates), and radiators are some of the most common places you could see nanofluids employed as coolants due to their improved thermal characteristics [13].Nanofluids have unique characteristics that might find several uses in heat transfer [14],[15] An crucial process in high-speed fluid flow, viscous dissipation converts the work a fluid does on a neighboring layer as a result of shear forces into heat. This has a substantial impact on the fluid's internal temperature. Most researchers, like Hayat, have done some work on the heating impact of viscous dissipation and Ohmic heating, which is the process by

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Offloading computations to unmanned aerial vehicles using deep reinforcement learning for catastrophe management

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ABSTRACT

Unmanned Aerial Vehicle (UAV) research and development may benefit from the rise of the Internet of Things (IoT) made possible by mobile computing. Disaster management, forest fire control, and distant operations are examples of low latency applications that are crucial to the development of mobile edge compute offloading in UAVs. In order to meet the goal demand and reduce transmission latency, the optimum offloading strategy is built on the application of deep reinforcement learning (DRL), and the task completion efficiency is enhanced utilizing an edge intelligence algorithm. Reduced execution latency and average energy usage are the results of the combined optimization. This DRL network-integrated edge intelligence technique takes use of computational operations to boost the likelihood that tracking and data transmission are both useful. The suggested combined optimization outperforms the current approaches for UAV development in terms of execution latency, offloading cost, and effective convergence. With the help of the suggested DRL, the UAV may make choices in real-time depending on the situation of the catastrophe and the availability of computer resources.

Keywords: deep reinforcement learning algorithm, edge intelligence, UAV energy consumption

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Photocatalytic effect of CuO nanostructures under sun light irradiation for environmental application

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Abstract:

The current study focuses on creating copper oxide nanostructures using a hydrothermal process, examining the fundamental characteristics of CuO nanostructures, and analysing the photocatalytic behaviour of CuO samples. SEM-assisted morphological analyses showed that CuO developed anoflakes structures. The x-ray diffraction (XRD) pattern confirms the modest variances in peak positions. The photo catalytic performance of the samples examined during the methylene blue (MB) dye degradation indicates that samples perform better.

Keywords: Morophology, CuO, Methylene blue, Photo catalysis

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Working from Home During the COVID-19 Pandemic: Pros and Cons from a Czech Employee's Point of View

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Abstract

Working from home has become a pandemic occurrence due to the COVID-19 viral illness pandemic, which has caused many changes for both corporations and their workers, as well as new obstacles for individuals. This article's primary objective is to provide a critical analysis, from the perspective of the Czech Republic's workforce, of the pros and cons of working remotely during the pandemic of 2020 and 2021. A subset of this research aims to understand how members of Generation Z think about and handle home-based jobs in relation to gender. The methodology included selecting and analyzing the content of 475 print and online sources that provided quantitative and qualitative data on the subject in order to achieve the primary aim. Next, we have a better understanding of these concerns thanks to the survey, comparison, and synthesis.

Keywords: home working, positives, negatives, Czech Republic.

Introduction

Economic and social upheaval on a worldwide scale has resulted from the coronavirus SARS-CoV-2 pandemic, which initially emerged in December 2019 in Wuhan, China, and has since spread throughout the globe. In both personal and professional spheres, it has had a profound impact on Czech citizens' life (ManpowerGroup, 2021). Both 2020 and 2021 have presented several obstacles for numerous businesses. Everybody has learned to be more adaptable because of the epidemic. Workplaces have altered, and for many companies, the culture has shifted entirely (HR Forum, 2021a). Findings from the "ManpowerGroup Index of the job market" conducted by ManpowerGroup Czech Republic indicate that 57% of Czech businesses have been adversely affected by the COVID-19 pandemic, with 10% having to entirely close their doors. Only 3% of businesses have seen an uptick in activity, while 35% have seen no change at all. When looking at the global picture, the impact of the pandemic on Czech firms is comparable to that of countries like Slovakia or Germany (EIPA, 2020; Deloitte, 2021; TfN, 2021). At 63%, businesses in the Czech Republic have reported that the pandemic has had a negative impact on their operations, which is in line with the worldwide average (ManpowerGroup, 2021).

The effects of the coronavirus epidemic on the workplace and its workers have been dramatic, speeding up digitalization in several sectors. Workers' habits have changed, managers no longer have daily face-to-face interactions with their subordinates, and workers' priorities when it comes to perks have been rethought. The epidemic, however, has brought us a new phenomenon: working from home. During this time, remote work has been the most talked-about HR issue. On the one hand, if individuals want it but are unable to get it; on the other hand, if they do not desire it yet still encounter it (202.212). The abundance of articles on working from home provides more evidence of this. According to Hájková (2021), the figure

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Abstract

Working from home has become a pandemic occurrence due to the COVID-19 viral illness pandemic, which has caused many changes for both corporations and their workers, as well as new obstacles for individuals. This article's primary objective is to provide a critical analysis, from the perspective of the Czech Republic's workforce, of the pros and cons of working remotely during the pandemic of 2020 and 2021. A subset of this research aims to understand how members of Generation Z think about and handle home-based jobs in relation to gender. The methodology included selecting and analyzing the content of 475 print and online sources that provided quantitative and qualitative data on the subject in order to achieve the primary aim. Next, we have a better understanding of these concerns thanks to the survey, comparison, and synthesis.

Keywords: home working, positives, negatives, Czech Republic.

Introduction

Economic and social upheaval on a worldwide scale has resulted from the coronavirus SARS-CoV-2 pandemic, which initially emerged in December 2019 in Wuhan, China, and has since spread throughout the globe. In both personal and professional spheres, it has had a profound impact on Czech citizens' life (ManpowerGroup, 2021). Both 2020 and 2021 have presented several obstacles for numerous businesses. Everybody has learned to be more adaptable because of the epidemic. Workplaces have altered, and for many companies, the culture has shifted entirely (HR Forum, 2021a). Findings from the "ManpowerGroup Index of the job market" conducted by ManpowerGroup Czech Republic indicate that 57% of Czech businesses have been adversely affected by the COVID-19 pandemic, with 10% having to entirely close their doors. Only 3% of businesses have seen an uptick in activity, while 35% have seen no change at all. When looking at the global picture, the impact of the pandemic on Czech firms is comparable to that of countries like Slovakia or Germany (EIPA, 2020; Deloitte, 2021; TfN, 2021). At 63%, businesses in the Czech Republic have reported that the pandemic has had a negative impact on their operations, which is in line with the worldwide average (ManpowerGroup, 2021).

The effects of the coronavirus epidemic on the workplace and its workers have been dramatic, speeding up digitalization in several sectors. Workers' habits have changed, managers no longer have daily face-to-face interactions with their subordinates, and workers' priorities when it comes to perks have been rethought. The epidemic, however, has brought us a new phenomenon: working from home. During this time, remote work has been the most talked-about HR issue. On the one hand, if individuals want it but are unable to get it; on the other hand, if they do not desire it yet still encounter it (202.212). The abundance of articles on working from home provides more evidence of this. According to Hájková (2021), the figure

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Impacts on the combination of self-reinforced polypropylene with interlayer composites

S C V Ramana Murty Naidu, L Mohana Rao, G.Hareesh, B.Sudhakara Rao

ABSTRACT:
Most research has concentrated on the mechanical performances of fiber-reinforced plastics (FRP) like carbon, glass, and aramid, but there has been a recent uptick in interest in creating a high-strength, lightweight composite as a possible replacement for traditional materials in a variety of industries. The hybrid composites, on the other hand, aren't as widespread, but they're thought to have great promise due to their adaptability and capacity to combine the advantages of other composites. Five different composite designs were created in this research utilizing the hand lay-up method. These designs include various kinds of woven fibers and sheets of self-reinforced polypropylene (SRPP). Depending on the manner of interlayer hybridization, several patterns are organized. Composite designs were subjected to the usual tensile and three-point flexural tests to determine their static mechanical characteristics. Carbon fiber-reinforced plastic (CFRP) shown superior tensile properties, according to the results of empirical investigations. The CFRP specimen outperformed the CAFRP specimen in terms of both tensile strength (46% higher) and elastic modulus (33% larger). In contrast to other hybrid composites and single-type carbon/aramid fiber reinforced plastics, CAFRP showed markedly improved flexural properties. In particular, the CAFRP structure outperformed the CFRP structure, showing 50% improvement in flexural strength and 19% improvement in modulus. Despite a decline in tensile and flexural strength, an improvement in overall strain level was seen with the incorporation of SRPP layers into the hybrid arrangement. Based on the results of this investigation, FRP composites are structurally strong and stiff with little elongation, while SRPP-based composites are tougher but less stiff.

1.0 INTRODUCTION

Composites are extensively used in several sectors, including aerospace and defense equipment, due to their high strength-to-weight ratio. Composites have expanded their use to various industries, including the shipping, construction, rail transportation, and automotive industries, thanks to its allure as a study subject for scientists and engineers in recent years [1, 2]. One example is the remarkable energy absorption capacity and exceptional specific mechanical characteristics of fiber-reinforced plastic (FRP) composites [3]. In addition, FRP composites' beneficial mechanical characteristics demonstrate the possibility of mass reduction in any structural and component design [4-6]. The mechanical characteristics, availability, and manufacturability of glass and carbon based FRP composites make them viable candidates for utilization as crashworthiness structures [7]. Additionally, aramid FRP are a kind of composite that is used in light-loaded constructions because of its high tensile strength and outstanding fatigue resistance [8].

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Research Article

Flax- and Graphene-Reinforced Natural Fiber Nanocomposites under Cryogenic Environment for Constructional Applications

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Mostly at the micro- and nanoscales, efforts were made to produce innovative thermoplastic nanocomposite materials. These composites were reinforced with natural fibres and artificial additives with improved mechanical characteristics. This research entails the creation of a novel nanocomposite material made up of unsaturated polyester resin, graphite at the nanoscale, and flax fibres at the microscale. Flax fibres make up 4, 8, and 12% of the binding matrix's weight, respectively. A constant quantity of nanoparticles equal to 4 wt% of the binding matrix is used. In order to stick the graphene to natural fibres, an appropriate surface alteration approach is needed, and this work will focus on the plasma technique of interface adherence. Fibres were employed as a reinforcement with polyester to create a nanocomposite that improved adherence between the fillers while also retaining the matrix alkalisation. In order to assess interferential adherence and fibre distribution homogeneity in the matrix system, the composite was made up of hand lay-up technique. The manufactured composite was engrossed into fluid N_2 at -196°C. A SEM was utilized to undertake treated and untreated specimens for spectroscopy analyses. Mechanical possessions like tension and flexural were accomplished. In comparison to previous tested doses, the 5 percent alkali-treated flax incorporating graphite has shown promising outcomes than other samples.

1. Introduction

Awareness of environmental issues and social response is raised, as improved pollution regulations and inefficient oil consumption, prompting consideration of ecofriendly products. Organic fibre is one of the most ecologically compost resources on the market, exceeding man-made materials in a number of ways. As per a recent industry assessment, the global market for organic fibre-based material is expected to reach $3.9 billion by 2023. The global trend in the NFPC industry, as per current estimates, will continue to develop fast [1]. A natural fibre-

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Research Article

Effect of Dwell Time on Fracture Load of Friction Stir Spot Welded Dissimilar Metal Joints

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The dissimilar materials joining in heavy structural fabrication industries is tedious work for welding and design engineers, since the weld region's criticality is encountered by hot cracking and its associated problems. Moreover, dissimilar materials are joined by mechanical locking such as rivets, bolt and nuts, and screws. Nowadays, the fasteners are eliminated by friction stir welding (FSW). The friction stir spot welding (FSSW) is a variant of FSW; it can be avoided by seam welding. Hence, in this investigation, FSSW is used for joining AA6061 aluminum alloy with mild steel using tool rotation speed, plunge depth and rate, and shoulder to pin diameter ratio. The experimental method observed that the joint fabricated with a rotational speed of 1000 rpm, plunge rate of 5 mm/min, plunge depth of 6 mm/min, and shoulder diameter to pin diameter ration of 3.0 yielded highest fracture load The optimum heat input could obtain the improvement in FSSW joint strength. Recrystallized grains and favorable intermetallic compound formation are the primary factors for sound welding.

1. Introduction

Friction stir spot welding (FSSW) technology has been successfully utilized to weld aluminium and magnesium alloy used in automotive and aerospace industries. Aluminum alloys have widespread applications in manufacturing aerospace and structural components due to their high strength [1]. The FSSW procedure was employed by Chowdhury et al. [2]which used FSSW on AA5754 and AZ31Balloy. Choi et al. [3] conducted an experiment using a tool constructed of high-strength steel and consisting of shoulder, shank, and probe. The tool had a shoulder, pin, and height which were 13 mm, 9 mm, and 0.5, respectively. Intermetallic compounds were found to develop at the interface of Al/Mg alloy joints. By accelerating the rotational speed of tool and holding time, the formation of the IMC

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A REPORT ON HEAT TRANSFER OPTIMIZATION OFSHELL AND TUBE HEAT EXCHANGER USING DIFFERENT FLUIDS USING THROUGH CFD ANALYSIS

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Abstract - *There are many models to characterize the behavior of the heat exchangers encountered in many industries. Shell and Tube heat exchangers are having special importance in boilers, oil coolers, condensers, and pre -heaters. They are also widely used in process applications as well as the refrigeration and air conditioning industry. The robustness and medium weighted shape of Shell and Tube heat exchangers make them well suited for high pressure operations. In this present work, three types of fluids are considered such as water, SiO_2 and Al_2O_3 nano particles. Thermal properties of different volume of concentration of nano particles are calculated theoretically to run the analysis. CATIA software is used to create the model and analysis have been performed in solid works flow simulation software. From the CFD results, overall heat transfer, effectiveness and friction factor are calculated and compared with respect to the velocity.*

Key Words: Water, sio_2, Al_2o_3, CATIA software, CFD

1. INTRODUCTION

Using passive techniques in order to enhance heat transfer characteristics in heat exchanger as been an interesting topic for scientists and researchers during recent decades. Numerical and experimental studies have been conducted in order to improve heat transferred by these techniques. The demand of reduction of the cost and dimensions of heat exchanger has motivated the searchers to investigate different ways of heat transfer enhancement. Passive heat transfer enhancement techniques are mostly preferred due to their simplicity and applicability in many applications. Furthermore, in passive techniques, there is no need of any external power input except to move the fluid.

1.1 The passive techniques are as follows

Treated surfaces are heat transfer surfaces that have a fine scale altercation to their finish or coating. The altercation could be continuous or discontinuous, where the roughness is much smaller than what affects single-phase heat transfer and they are primarily used for boiling and condensation duties

Rough surfaces are generally surface modifications that promote turbulence in the flow field, primary in single phase flows and do not increase the heat transfer surface area. Their geometric features range from random sand-grain roughness to discrete three dimensional surface protuberances.

Extended surfaces more commonly referred to as finned surfaces provide an effective heat transfer surface area enlargement. Plain fins have been used routinely in many heat exchangers. The newer developments, however have led to modified finned surfacesthat also tend to improve the heat transfer coefficients by disturbing the flow field in addition to increasing the surface area.

- Displaced enhancements devices are inserts that are used primarily in confined forced convection and they improve energy transport indirectly at the heat exchange surface by displacing the fluid from the heated or cooled surface of the duct with bulk fluid from the core flow.

- Swirl flow devices produce and superimpose swirl or secondary recirculation on the axial flow in a channel. They include helical strip or cored screw-type tube inserts ,ducts, and various forms of altered (tangential to axial direction) flow arrangements , and they can be used for single –phase as well as two- phase flows Coiled tubes are what the name suggests, and they lead to relatively more compact heat flows in either a dilute phase (gas-solid suspensions) or dense phase(fluidized beds). Vortices, which promote higher heat transfer heat coefficients in single phase flows as well as in most regions of boiling.

- Surface tension devices consist of wicking or grooved surfaces, which direct and improve the flow of liquid to boiling surfaces and from condensing surfaces.

- Additives for liquids include the addition of solid particles, soluble trace additives, and gas bubbles in single–phase flows, and gas bubbles in single –phase flows, and trace additives ,which usually depress the surface tension of liquid, for boiling systems.

- Additives for gases include liquid droplets or solid particles, which are introduced in single-phase gas flows in either a

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Enhancement of heat transfer rate using MgO nanofluid in heat exchanger

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Abstract -

Energy conservation, conversion, and recovery are vital thinking among people due to environmental issues. The effectively way to save energy of materials and facilities in which heat exchanger plays a significant role. Mostly in industries uses heat exchangers for enchantment of heat transfer. The common used heat transfer fluids are water, ethylene glycol and propylene glycol as base fluids in heat exchanger. Dispersion of Nano particles in a base fluid shows solution in problems such as high pressure loss, erosion of material. The thermal conductivity of the base fluid increases by adding Nano particle which in turn increases the heat transfer rate. In this paper heat exchanger performance is analyzed by adding Magnesium oxide with base fluid (a mixture of Distilled water and propylene glycol). The thermal property i.e. overall heat transfer coefficient of heat exchanger is calculated and compared with base fluid. Experiments were conducted for various volume concentration 0.1%,0.3% and 0.5% and observed that the addition of manganese oxide nanoparticles enhances the thermal performance. The maximum enhancement in the convective heat transfer is observed at 0.5% volume concentration. Experiments will be conducted by varying the inlet temperature, nanoparticle volume concentration and fluid flow rate. Heat transfer coefficient, thermal conductivity and nusselt number of MgO nano particles are selected as performance assessment parameters.

Key Words: Heat transfer rate, heat exchanger, Manganese Nanoparticle Nusslet number.

1. INTRODUCTION

Most industrial processes involve heat transfer and more often, it is required that these heat transfer processes be controlled. Heat transfer is the term used for thermal energy from a hot to a colder body. Heat transfer always occurs from a hot body to a cold one, as a result of the second law of thermodynamics. Where there is a temperature difference between objects in proximity, heat transfer between them can never be stopped but can only occur through threeways which are conduction, convection and radiation. Though study has also shown that phase change is accompanied with thermal energy transfer.

Mohammad Hossein Aghabozorg et al. [1], experimentally studied the overall heat transfer coefficient of an automobile radiator using graphene nanoplatelets based coolant with the volume fractions of 0.1-0.5% and the nanofluid flow rates of 12.5g/s-62.5g/s. They also variedthe ambient air velocity and the nanofluid inlet temperatures from 1-5 m/s and 35 to 45 respectively. Their results stated that the overall heat transfer coefficient enhanced up to 104%at 0.5% volume fraction, 62.5g/s flow rate and 5 m/s ambient air velocity compared to thebase fluid and 39% enhancement in pressure drop was recorded at the highest mass flow rateof 62.5g.

T Aseer Brabin1 et al. [2], conducted the experiments on an automobile radiator with ethylene glycol based Cu nanofluids. They varied the volume fraction of the nanoparticles in the range of 0-2% and observed that 3.8% of heat transfer enhancement with the dispersion 2% MgO nanopowder at the Reynolds number of 6000 and 5000 for air and coolant respectively. **K.Karimullah Khan et al. [3],** experimentally studied the overall heat transfer coefficient of CuO/water nanofluid in a car radiator. Their results show that the overall heat transfer coefficient increases with the volume fraction of the nanoparticles and the maximum enhancement in overall heat transfer coefficient up to 8% obtained at 0.4% concentration in comparison with the base fluid.

M. Raja.R.M. Arunachalam. et al. [4], investigated thermal conductivity and dynamic viscosity of TiO2-SiO2 nanofluids in PG+water mixture. The experiments were performed with the volume fractions of 0.5-3.0% and the temperatures from 30°C-80°C. The results stated that the maximum thermal conductivity of nanofluids was enhanced up to 22.8% for 3.0Vol% and temperature of 80°C. Meanwhile, the highest average relative velocity was obtainedfor 3.0Vol% with 62.5% increment.

Kishan H. Maheshwari. et al. [5], experimentally studied rheological behaviour of water-EG coolant dispersed with MgO-MWCNTs hybrid nanomaterials with the volume fractions of 0.025-0.8%. The experiments were performed at various shear rates within the temperatures from 25-60°C. The results showed that nanofluid samples had Newtonian behaviour and nanofluid viscosity decreased with the increasing temperature and augmented with increasing the volume fraction. The grater changes in the relative viscosity occurred by increasing the ratio of particles with volume fraction of 0.8% to almost 80%.

Kallalu Harika., Tummala.Likhitha et al. [6], experimentally studied heat transfer characteristics of Al2O3/water based nanofluids in an automobile radiator with

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EXPERIMENTAL INVESTIGATION ON FREE CONVECTION HEAT TRANSFER AUGMENTATION USING TRANSFORMER OIL – Cuo NANO FLUID

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Abstract - *Conventional fluids such as water, engine oil, kerosene, ethanol, and ethylene glycol have lower thermal conductivity compared to solids. Lower thermal conductivity of fluid became an obstacle to use in different applications. To overcome this obstacle, a new method such as dispersing nano sized solid particles in fluids which enhance the thermal conductivity of base fluids significantly and it is named as nano fluids. These nano fluids are succeeded in many applications whereas coming to natural convection it faces debacle. Nano fluids used to enhance the convection heat transfer but conversely by using the nano fluids deterioration occurred. Some of the researchers got enhancement but they got enhancement in lower volume fractions. The reason behind the deterioration is aggregation of nano particles leads to clogging and then to sedimentation and to find out the heat transfer enhancement using ultra sonication, magnetic stirring and surfactant addition is used to modify. But these modifiers affect the properties such as thermal conductivity, viscosity, specific heat etc.*

Particle size, shape, structure strongly influences the properties of nano fluids. The parameters thermal conductivity, viscosity, specific heat, thermal expansion coefficient, density all are related to volume fraction. It is extremely sensitive to deal everything related to volume fraction. To minimize the complexities Cuo of 30nm with spherical shape are procured. Volume fractions are 0.05%, 0.1%, 0.15%, 0.2% are preferred to conduct experiment ultra-sonication, magnetic stirring is preferred. Enhancement is obtained up to 0.15% volume fraction and further deterioration occurs. In the natural convection heat transfer enhancement through nano fluids is explained Correlations between Nusselt number and Rayleigh are drawn and presented.

Key Words: Nano fluid, Volume fraction, Cuo

1. INTRODUCTION

Fluids are frequently used as heat carries in heat transfer equipment. Examples of important use of heat transfer fluids include vehicular and avionics cooling systems in the transportation industry, hydraulic heating and cooling systems in buildings, industrial process heating as well as cooling systems in petrochemical, textile, pulp and paper, chemical, food and other processing plants. In all these applications, the thermal conductivity of heat transfer fluids plays a vital role in the development of energy-efficient heat transfer equipment.

1.1 Obstacles encountered to enhancement of heat transfer:

It has to be admitted that despite considerable previous research and development efforts put on heat transfer enhancement, few important improvements in cooling capabilities have been constrained because of the low thermal conductivity of conventional heat transfer fluids. However, it is well known that metals in solid form have orders of magnitude larger thermal conductivity of copper at room temperature is 700 times greater than that of water and is 3000 times greater than that of engine oil. And, the thermal conductivity of metallic liquids is much greater than that of non-metallic liquids. Therefore, thermal conductivities of fluids that contain suspended solid metallic particles are expected to be significantly more enhanced when compared with conventional heat transfer fluids.

1.2 Role of Nano fluids: decade ago, a new kind of heat transfer fluid called nano fluid was introduced which was derived from stably suspending nano particles in conventional heat transfer fluids, usually liquids resulted from the pioneering work of choi and Eastman (1). Commonly used 2 oxide nano particles are Aluminum (Al), Silicon (Si), Titanium (Ti), Copper (Cu), Zinc (Zn), Iron (Fe), Magnesium (Mg) and Silver (Ag) and base fluids are water, engine oil, kerosene, ethanol, methanol, ethylene glycol and mono ethylene glycol. Nano fluids consisting of such nano particles suspended in liquids have been shown to enhance the thermal conductivity as well as convective heat transfer Performance of the base fluids. It has been reported that the enhancement of nano fluids depends not only on nanoparticle parameters but also on their suspension stability in base fluid

2. LITERATURE REVUEW

In 1883 maxwell et.al [1] predicted that dispersion of solid particles may alter the properties of the fluids. However, he did not mention the size of solid particles. In 1993, Masuda et.al [2] used to disperse the submicron particles of Al2O3, Sio2, Tio2 and he observed enhancement in the properties of

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Configuration and Voltage Control of a Solar-Wind Hybrid Microgrid Employing STATCOM with Fuzzy Logic Controller

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Abstract

The ability of wind and solar photovoltaic (PV) systems to generate electricity is heavily dependent on weather conditions. Their output fluctuates due to their intermittent nature. As a result, the requirement for energy transmission and distribution systems to compensate quickly is becoming increasingly crucial for this reason fuzzy logic controller is used to better results. The Static Synchronous Compensator (STATCOM) is a device that can be used to compensate for reactive power and reduce voltage fluctuations generated by the system and renewable energy sources. This research looks at how to simulate a Solar PV-Wind Hybrid Micro-grid and how to raise the system's stable working limit with the addition of STATCOM. The main contribution of this research is the use of genetic algorithms (GA) to optimize the gain parameters of four PI controllers in STATCOM, resulting in superior responses and voltage stability in the nonlinear nature of a solar-wind hybrid micro-grid. A 2 MW wind turbine model based on a doubly fed induction generator (DFIG), a 0.4 MW solar PV power system model, and a 3 MVAR STATCOM are among the Simulink models of the system design. The voltage fluctuation at the end of the bus bar is reduced by 8% when utilising a traditional PI controller, according to certification. The results of Fuzzy logic controller optimization are compared to those of a traditional controller and a GA-based PI controller, and better results are produced.

Index Terms: Flexible AC transmission systems (FACTS); Genetic Algorithm; PV-Wind hybrid system; Static synchronous compensator; Voltage control.

I. INTRODUCTION

Renewable energy applications have grown in popularity, particularly in recent years. Increasing energy use, significant advancements in energy production technology and growing public awareness of environmental issues are driving research into alternative energy and distributed production. For applications with minimal installed capacity, a hybrid structure comprising of an efficient photovoltaic (PV) system and a wind energy system can be created utilising various control techniques. Because renewable energy systems, such as wind alone and hybrid Wind/PV, are not totally safe in terms of satisfying load demand, power instabilities occur, and reactive power compensation is an emerging need for a hybrid system's stable operation. In all energy systems, reactive power adjustment is needed. Reactive

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Research Article

Optimization and Mechanical Characteristics of AA6061/Zirconia Nanocomposites Fabricated by Ultrasonic-Aided Stir Casting Method

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Using the Taguchi Grey response surface approach, this study investigates the effect of novel ultrasonic-aided stir casting conditions on the production of AA6061/zirconia nanocomposites. A Taguchi L_{16} orthogonal array was utilized to conduct the researches, which included ultrasonic power (1.75-2.5 kW), time (5-20 min), temperature (750-900°C), which can cause premature solidification, stir pressure (100-250 MPa), and reinforcement weight percentage (wt% of reinforcement). Ultrasonic-aided stir casting technique has five adjustable parameters (2-5). The ultimate tensile strength, elongation percentage, hardness, and size of the grain material were some of the metrics used to evaluate the process performance. It was decided to employ the response surface approach to model and optimize the numerous replies into one grey relational analysis. AA6061/zirconia nanocomposites were studied using statistical methods such as 3D surface plots and variance analysis. 2.2537 kW, 16.28 min ultrasonic duration, weight % of reinforcement of 1.9, stirring temperature of 700.73°C, and stirring pressure of 142.63 MPa were found to be the best parameter values.

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Research Article

Effect of Friction Stir Welding on the Mechanical and Microstructural Behaviour of AA7075 Aluminium Alloy

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In this research work, an attempt was made to weld AA7075 alloy using the friction stir welding (FSW) technique. The experimental runs were designed using the Taguchi L18 orthogonal array and welds were obtained by varying tilt angle, tool rotation speed, tool feed rate, and axial load, whereas weld quality was accessed in terms of tensile strength and microhardness. The microstructure was examined using an optical microscope. The studies revealed that the tool angle was the most influential factor followed by the tool feed rate as both the parameters impacted the intensity of heat developed. It was observed that the tool tilt decreased the microhardness of the welds. The UTS values and macrostructure imply that the weld should be subjected to higher tool torque conditions. The material flow was not periodic nor coordinated, as seen by the tool-tilted weld's macrostructure. With a tool tilt, the weld pressure is lowered, and the lower pressure could not be enough to prevent volumetric defects. The reduced pressure at quicker welding rates may have had an effect on the development of flaws.

1. Introduction

AA7075, an aerospace aluminium alloy, has found its application in the manufacturing of aircraft structural wings and fins [1]. Zinc, a major alloying element of seven series aluminium alloy, possess a melting point of 420°C and boiling point of 907°C [2]. When joined utilizing the fusion welding technique, these zinc particles get evaporated, which alters the elemental composition of the aluminium alloy [3]. To overcome these issues, it was preferred to machine the aerospace aluminium alloy with solid state welding techniques [4]. Friction stir welding (FSW), cold metal transfer (CMT), ultra-sonic welding (USW), and hot pressure welding (HPW) are the distinct solid state welding process [5]. In joining innovation, FSW has drawn in an extraordinary consideration as a strong-state welding procedure used to join comparable and different ferrous and nonferrous metals with practically no deformities [6]. FSW can stay away from the vast majority of the issues related to unique nonferrous materials joined by fusion welding processes [7].

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Grid-Connected Hybrid Microgrids Using Modified UIPC for Power Flow Control of Interconnected AC-DC Microgrids Using ANN

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Abstract

This research proposes a new method for power flow regulation of interconnected AC-DC microgrids in grid-connected hybrid microgrids based on a modified unified interphase power controller (UIPC). The examined system is a standard grid-connected hybrid microgrid with one AC microgrid and one DC microgrid. These microgrids are linked together using a modified UIPC rather than parallel-connected power converters. The typical UIPC structure, which requires three power converters in each phase, is adjusted as the first contribution of this study, such that power exchange control across AC-DC microgrids is implemented with a lesser number of power converters. One power converter in each phase, referred to as a line power converter (LPC), and a power converter that regulates the DC bus voltage, referred to as a bus power converter (BPC), are included in the redesigned structure.

The AC microgrid is linked to the main grid by LPCs, which include DC buses that can function in either capacitance mode (CM) or inductance mode (IN) (IM). The LPCs' control structures use a fuzzy logic controller. To eliminate errors in membership function design, the fuzzy inference system is optimized using the H∞ filtering method. The DC microgrid supplies the LPCs' DC voltage via the BPC. The DC microgrid voltage is provided here by a PV system, hence the LPCs' DC link voltage fluctuates. As a second contribution, a new nonlinear disturbance observer-based robust multiple-surface sliding mode control (NDO-MS-SMC) technique for DC side control of the BPC is provided to stabilize the DC link fluctuations. The simulation results show that the proposed power flow control technique for hybrid microgrids in the upgraded UIPC is successful. In this research proposes further extension artificial neural network (ANN) is using to control the UIPC converters.

Index Terms: UIPC, power control, disturbance observer, multi-surface SMC, hybrid microgrid.

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Analyzing emission characteristics of bio-fuel at varying mass fraction of nanoparticles

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Abstract

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Virtual Ally: A Tableau-Based Campus Navigation System

S S R M Raju Paidi, Kondala Hemalatha, Basava Kusuma Kumari, Peddinti Sateesh

Abstract:- A huge influx of freshmen is accepted annually by the institution. Despite the presence of floor maps, finding one's way about the campus and locating various administrative buildings, departments, libraries, and cafeterias may be quite a challenge. Because of this, it is not easy for a newbie to reach the necessary location in a timely manner. When it comes to finding specific places and the fastest way to go from one place to another on campus, a map-based program like Virtual Ally is invaluable. Consequently, no one on campus will be as confused or irritated. The primary goal of this system is to design a prototype for an app that can be used on smartphones to navigate the university campus. Tableau and Android Studio are used in the development of the suggested system. The system maps each spot using the tableau sketching tool and utilizes coordinates derived by studying map pictures to find each region.

KEYWORDS
A smart campus, indoor navigation, Tableau, and a mapping positioning system are all terms that describe this campus navigation system.

INTRODUCTION

Navigating entails precisely identifying the user's position and then displaying instructions to lead them. in practical ways to reach their goal. The college campus is enormous, making it difficult for first-time visitors and students to locate common areas like the cafeteria, classes, and administration. There is a lot of chaos since many students become disoriented and wander about the campus during the festivities.

In order to aid students, workers, and visitors with location-search and route-planning, this study primarily aims to create a system that can provide an ideal navigation solution by showing the fastest way. To help students find their way around campus, "Virtual Ally" A new system called tableau for UCoE has been created. It lets users find certain spots on campus and shows them the environment around those regions.

Data analysts, scientists, and statisticians may all benefit from Tableau, a robust data visualization tool, when trying to make sense of large amounts of data and draw clear findings from their studies. Quick data processing and the ability to generate the necessary data visualization output are two of Tableau's most renowned features. Based on the coordinates entered into the Tableau drawing tool, a floor plan is being generated and a route is being provided from origin to destination using Tableau.

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Assessing the steadiness and dependability of a GIS-integrated broadband current array sensing system

Anem Apparao, Koyyana Praveen, Padapana Usha Rani, Baratam Murali

ABSTRACT

By keeping an eye on things like power frequency overvoltage, relative dielectric loss, and partial discharge, a broadband current array sensing system may help gas insulated switchgear identify defects even more accurately and prevent equipment problems. While designing a defect observer and calculating the system stability criteria under **b**∞ conditions, the dynamic model of the system is examined and used to derive the system state equation. Using cloud models, we confirm the system's stability under varying packet loss rates and propose a strategy based on electromagnetic compatibility to keep packet loss rates below 50%.

Keywords: gas insulated switchgear, current sensing, stability, reliability, system control

Introduction

Online monitoring and sensing dependability is in high demand due to the rising reliability requirements for gas insulated switchgear (GIS) [1]. It is difficult to immediately reflect the severe condition of internal flaws in the equipment using traditional partial discharge (PD) sensing technologies like ultra-high frequency and ultrasound since they are independent and indirect measures. The inability to integrate systems is a result of the absence of a common sensing infrastructure [2-4].The Broadband Current Array Sensing System (BCASS) measures the current at various frequencies of the equipment's location, allowing for live monitoring of crucial conditions like power loss and power factor (PD) while the equipment is operating. Sensor data communication, analysis result transmission, and sensor measurement feedback management are all handled by BCASS via wired and wireless means [5-7]. Substation environments are common places to find wireless sensor networks,

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ABSTRACT

By keeping an eye on things like power frequency overvoltage, relative dielectric loss, and partial discharge, a broadband current array sensing system may help gas insulated switchgear identify defects even more accurately and prevent equipment problems. While designing a defect observer and calculating the system stability criteria under **b**∞ conditions, the dynamic model of the system is examined and used to derive the system state equation. Using cloud models, we confirm the system's stability under varying packet loss rates and propose a strategy based on electromagnetic compatibility to keep packet loss rates below 50%.

Keywords: gas insulated switchgear, current sensing, stability, reliability, system control

Introduction

Online monitoring and sensing dependability is in high demand due to the rising reliability requirements for gas insulated switchgear (GIS) [1]. It is difficult to immediately reflect the severe condition of internal flaws in the equipment using traditional partial discharge (PD) sensing technologies like ultra-high frequency and ultrasound since they are independent and indirect measures. The inability to integrate systems is a result of the absence of a common sensing infrastructure [2-4].The Broadband Current Array Sensing System (BCASS) measures the current at various frequencies of the equipment's location, allowing for live monitoring of crucial conditions like power loss and power factor (PD) while the equipment is operating. Sensor data communication, analysis result transmission, and sensor measurement feedback management are all handled by BCASS via wired and wireless means [5-7]. Substation environments are common places to find wireless sensor networks,

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Assessing the steadiness and dependability of a GIS-integrated broadband current array sensing system

Anem Apparao, Koyyana Praveen, Padapana Usha Rani, Baratam Murali

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In Press, Corrected Proof ? What's this?

Effective utilization of biodiesel blends with nano additives on diesel engine towards eco-sustainability

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Abstract

The sustainable fuel known as biodiesel can be produced from either vegetable oils, animal fats, or even recycled cooking oils. It has the potential to cut greenhouse gas emissions and lessen our dependence on oil when compared to traditional diesel derived from petroleum. Burning fossil fuels releases greenhouse gases, which are a key contributor to climate change as well as other pollution. In India's agriculture industry, making biodiesel from plant sources, especially oils that can't be eaten, has gained a lot of popularity in recent years. In addition, there are not enough of these biodiesels on the market to match the surging demand for fossil fuel. A new biodiesel composition that can be used in diesel engines is made from non-edible oils. The development of a new combination of biodiesel is crucial in order to keep up with the surging demand for fossil fuels. The purpose of this study is to create a novel biodiesel blend of 50 % cottonseed biodiesel and 50 % rapeseed biodiesel and diesel with cerium oxide. The results of CR20N50 show a 15–18

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Analysis of aerodynamic characteristics of car diffuser for dissimilar diffuser angles on Sedan's using CFD

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Upcoming 5G Network Enhancement Algorithms for Wave Rate Scheduling and JUP

Chakravarthi,V.K, Usha rani,G.V, Udaya Bhanu.V, Venkatesh.Y

Abstract:

Security and privacy are key concerns in wireless communication networks due to the open nature of the wireless medium, which makes wireless transmission vulnerable to eavesdropping and hostile assaults. Implementing higher-layer key distribution and management has been made much more difficult by the advent and growth of decentralized and ad hoc wireless networks. Therefore, physical layer security has become a practical means of ensuring secure communication with little complexity. Potentially, we may apply this method to the design and improvement of wireless network physical layer security. Important Terms: Millimeter wave, ad hoc, wireless, self-backhaul, mmWave communications, multi-hop scheduling, ultra-dense tiny cells, stochastic optimization, and reinforcement learning are all way of describing communication security.

INTRODUCTION

The millimeter wave (mmWave) spectrum has very little interference and a lot of available capacity, making it an attractive choice for wireless applications in industrial settings. Innovative uses in manufacturing have emerged in the last few years, including collaborative mobile robots, real-time visual monitoring, and equipment motion control with pinpoint accuracy. Transmitting data, video, and control signals in real-time is essential for these applications, which calls for very high throughput, lightning-fast reaction times, and dependable performance. Recent research suggests that industrial control applications may need connection rates of over 500 Mbps with latency in the single digits of milliseconds. The current state of industrial wireless technology is inadequate for emerging industrial uses since it is mostly designed to function in the unlicensed 2.4 GHz or 5 GHz frequency bands. However, in wireless settings, mmWave communication is susceptible to interference, especially in scatter-rich industrial settings like factories. Extreme blocking and coverage problems arise in non-line-of-sight (NLOS) channels because to the large pass loss and high signal intensity fluctuation caused by narrow wavelengths. The total transmission latency (TLatency) of a packet is affected by several factors. One of these is the time it takes for electromagnetic waves to travel through the air. Another is the time it takes to position frames to the transmission time interval (TTI) at the link layer. Depending on the packet size and modulation scheme, this can be one or more TTI times. TPHY is the processing time in the physical (PHY) layer, which is usually a fixed delay. Finally, TQueue is the queuing delay for buffered packets until they are allocated channel resources. It is important to mention that the wireless medium access control (MAC) layer scheduler primarily controls TQueue, which is a configurable delay.

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Optimizing PEEK impact strength through multi-objective FDM 3D printing

Dr.B.Hari Sankar, L Mohana Rao, Vavilapalli Prabhakar, Palaka Nagaraju
Department of Mechanical Engineering

ABSTRACT

Because of their adaptability and low cost, thermoplastic materials including polylactic acid, nylon, polyethylene terephthalate glycol, acrylonitrile butadiene styrene, polylactic acid, and thermoplastic polyurethane are preferred in fused deposition modeling 3D printing. Unfortunately, compatibility issues with current equipment and procedures caused by high grade thermoplastic material have prevented its widespread use in FDM 3D printing. Making the necessary changes to 3D printing ear, software, and settings to accommodate new materials may be a time-consuming and costly process. The unique processing conditions and parameters required by each material make quality control and consistency maintenance a challenging task. Because of this variation, 3D printing cannot produce consistently high-quality parts. In addition, specific considerations are needed for optimizing the FDM settings for high-grade polymers (HGPs) such as polyether ether ketone (PEEK) because of the unique properties of these materials. As a result of the printing process's large temperature gradient and uneven heat distribution, residual stresses and deformations might occur, diminishing the material's quality and, more specifically, its impact strength. Using only three process parameters—build orientation, in-fill density, and chamber temperature—this paper improves a commercially available 3D printing PEEK. Additionally, the study endeavors to develop a model that can foretell the 3D printed object's Impact Strength (IS), a crucial factor to consider. In this article, we look for evidence of a relationship between the impact strength, printing time, and material use, which are all response variables or output variables. There seems to be a strong link between them, as shown by the results. The subsequent IS of 86.5 kJ/m², print time of 89 minutes, and material use of 3.26 grams are attained by using a particular parameter configuration. Setting the print density to 100% to maximize impact strength results in a notable 9.18% reduction in printing time and an 11.66% drop in material use. When a number of goals must be satisfied, this optimization method demonstrates that composite desirability is the way to go. A determination coefficient more than 50% is achieved by the suggested regression model for predicting the impact strength.

INTRODUCTION

A number of benefits, such as decreased material use, design flexibility, and near net shape production (NNSP), are offered by additive manufacturing (AM) compared to traditional manufacturing. Fused filament fabrication (FFF), often called fused deposition modeling (FDM), is one of many AM technologies that has recently gained popularity. Its simplicity, low cost, and extensive usage in engineering, education, and prototyping have all contributed to its rise in popularity [1, 2]. In comparison to other methods, FDM has lower system costs and shorter build times because to its layer-by-layer method of employing melted filament, which allows for efficient item construction with minimum waste formation. Designers get significant insights on form, function, and fitness via the production of 3D printed products using FDM. To evaluate the mechanical behavior of 3D printed components, particularly for high-grade polymers such as Polyether ether ketone (PEEK), Polyetherketoneketone (PEKK), and Polyethylenimine (PEI), which are used as metal substitutes [3, 4], mechanical testing is essential. This has become more difficult over the years due to improvements in high-performance polymers (see Figure 1). Numerous biomedical therapies have made extensive use of PEEK and its variants.

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A number of benefits, such as decreased material use, design flexibility, and near net shape production (NNSP), are offered by additive manufacturing (AM) mpared to traditional manufacturing. Fused filament fabrication (FFF), often called fused deposition modeling (FDM), is one of many AM technologies that has recently gained popularity. Its simplicity, low cost, and extensive usage in engineering, education, and prototyping have all contributed to its rise in popularity [1, 2]. In comparison to other methods, FDM has lower system osts and shorter build times because to its layer-by-ayer method of employing melted filament, which allows for efficient item construction with minimum waste formation. Designers get significant insights on form, function, and fitness via the production of 3D printed products using FDM. To evaluate the mechanical behavior of 3D printed components, particularly for high-grade polymers such as Polyether ether ketone (PEEK), Polyetherketoneketone (PEKK), and Polyethylenimine (PEI), which are used as metal substitutes [3, 4], mechanical testing is essential. This has become more difficult over the years due to improvements in high-performance polymers (see Figure 1). Numerous biomedical therapies have made extensive use of PEEK and its variants.

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