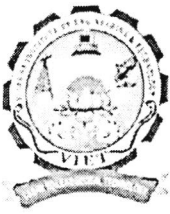


3.3.2



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DIPLOMA ENGINEERING MANAGEMENT



COLLEGE CODE
VSPT

A.Y.:2022-2023



3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the year

S.No	Title of paper	Name of the author/s	Department of the teacher	Year of publication
1	Green Synthesis And Characterized Of Mgo Nanoparticles From Black Vitex Negundo Leaf Extract	M.UDAY BHASKA R	BSH	2022-2023
2	Investigating Strength Characteristics Using Non- Destructive Tests For Concrete With Partial Replacement Of Cement With Rice Husk Ash And Ceramic Powder	V. BHARGA VI	CE	2022-2023
3	An Experimental Study To Investigate Strength Properties Of Concrete With Partial Replacement Of Cement With Metakaolin And Ceramic Powder	CH. SAI KIRAN	CE	2022-2023
4	Destructive Assessment Of M30 Grade Concrete Using Cementitious Materials At Different Curing Methods	K JAGAN	CE	2022-2023
5	Numerical Assessment Of New Precast Concrete Connections Under Cyclic Loadsan Experimental Study On M30 Grade Of Concrete By Partial Replacement Of Coarse Aggregates With Jhamma Bricks	CH SAI KIRAN	CE	2022-2023
6	Numerical Assesment Of New Precast Of Concrete Connections Undr Cyclic Roadfs Experimental Investigation On Mechanical And Durability Properties Of Nano Fly Ash And Stone Powder Dust As Partial Replacement In Concrete	V BHARGA VI	CE	2022-2023
7	Investigating strength characteristics using non destructive test for M20 grade concrete by partially replace in cement with rice husk ash and ceramic powder	K JAGAN	CE	2022-2023
8	Effect of alccofine on high strength concrete	K JAGAN	CE	2022-2023
9	Optimizing The Efficiency Of Manets Through An ANFIS- Based DSR Routing Protocol For MANETS	TEJASWI NI KONE	CSE	2022-2023
10	Skin Cancer Classification Using Convolutional Neural Networks	USHA MATTA	CSE	2022-2023
11	Video shoot transaction deduction using convolution neural network Euclidean distance on algorithm and change point analysis algorithm	USHA MATTA	CSE	2022-2023
12	Lung cancer prediction using machine learning methods	USHA MATTA	CSE	2022-2023
13	10 Kw Grid Connected Rooftop Solar Pv Power Plant	MR. K.S.B VARAPR ASAD	EEE	2022-2023

14	Improving The Maximum Power Point Tracking In Wind Farms With Pid And Artificial Intelligence For Controller For Switch Reflectance Generators	GV RAMANA	EEE	2022-2023
15	Transfer learning for image based plant diseases deduction using residual network	USHA MATTA	CSE	2022-2023
16	Statcom based power quality improving in Hybrid power system	MR. K.S.B VARAPR ASAD	EEE	2022-2023
17	Solar PV waste multi level in water for BLDC motor drive	CH V R SRIKANT H & T SRINU	EEE	2022-2023
18	Some aspects on design and performance evaluation thoughts of integrated 3 Phase solar PV-UPQC	MR. K.S.B VARAPR ASAD & CH V R SRIKANT H & O MAHESW ARI	EEE	2022-2023
19	Load Frequency Control In Two Area Power System Using Fuzzy Interface	T SANOTSH & R MAHA LAKSHMI & K ESTERUR ANI	EEE	2022-2023
20	Hybrid Powered Electric Bycycle Using Solar & Dynamo	CH B R SRIKANT H	EEE	2022-2023
21	Design and fabrication of solar refrigerator by using peltier module	KIRAN KUMAR & VENKAT A RANGA CHARYU LU	ME	2022-2023
22	Methodology foe evaluating delay and power on binary counters and block level optimisation	B JEEVAN RAO	ECE	2022-2023
23	Development analysis of in GaAs nano wire junction less MOSfet with 10nm gate length	B JEEVAN RAO	ECE	2022-2023



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Contents lists available at ScienceDirect

Materials Today: Proceedings

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Green synthesis and characterization of MgO nanoparticles from black vitex negundo leaf extract

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ARTICLE INFO

Article history:
Available online xxxx

Keywords:
Karunochi
XRD
Particle size
FTIR
Photon energy

ABSTRACT

Green Synthesis of nanoparticles from plant extracts has already established the stature of an effective eco-friendly route which can serve as an alternative to the existing conventional methods. In the present research, MgO nanoparticles (NPs) have been synthesized from pharmaceutical black vitex negundo (Karunochi) leaf extract. The synthesis of NPs obtained by employing bio-safe routes is in the limelight because nontoxic reagents are involved in the form of green extracts. The synthesized sample has been characterized by the X-ray diffraction; Fourier transforms infrared spectroscopic analysis, and UV spectral analysis. Photon energy of MgO nanoparticles is estimated to be 5.9223 eV from the data of optical absorption and the obtained FTIR spectrum confirms the presence of the organic molecules in the NPs. The optical band gap energy is calculated to be 5.915 eV for the synthesized NPs which is not yet reported, to date, according to the literature. From the data of XRD analysis, the particle size can be estimated such that it is calculated to be 22 nm which is accomplished by supplementing the crystalline d-spacing with the values of (hkl) . The present outcome of the research is that the NPs can be used as a supplementary medicine to treat covid-19 patients and they can also be utilized as pest control. The synthesized sample can be a cough remedy and it has the nature of acting as an antiseptic.

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Selection and peer-review under responsibility of the scientific committee of the International Conference on Sustainable Nanotechnology and Nanomaterials.

1. Introduction

In recent years, Green Synthesis has been recognized as a promising area of research in bio-nanotechnology with which it could be attained the benefits of both economic as well as environment-friendly features such that the current investigation is based on this method. A large number of multifaceted nano-enabled items have become a possibility at the advent of nanoparticles throughout the first two decades of the twenty-first century and continues to expand till today such that the trend will continue to flourish [1–2]. Metallic nanoparticles (MNPs) are well known for possessing unique features that set them apart from micro-sized materials. It can be used in a variety of industrial, agricultural, and domestic purposes. As a result, the development and mass production of novel MgO NPs has been hastened in order to

meet the ever-increasing demand for nanotechnology-based goods and gadgets [3–4]. The synthesis and application of MgO NPs in biomedical applications have been reviewed in a number of recent studies. In contrast to previous studies, we focus on emerging biological applications based on UV spectroscopic features of MgO NPs, as well as focusing on the probable novel insights into and bringing about a method of toxicity action against diverse microorganisms, cancer, and inflammations. [5–7]. Since Richard Feynman proposed nanotechnology in 1959, it has been used in a wide range of domains which include electrical, optical, and magnetic devices, biology, medical, energy, defence, pharmaceuticals, food, and agriculture industries [8]. According to the World Health Organization (WHO), hazardous food including chemicals or microbes such as bacteria, viruses, and parasites cause over 200 ailments ranging from cancer to diarrhea. About 600 million people (nearly 10 % of the world's population) are predicted to become ill as a result of poisoned food each year, with 420,000 deaths. Because of these dangerous bacteria found in food, scientists have concentrated

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<https://doi.org/10.1016/j.matpr.2022.12.087>

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Selection and peer-review under responsibility of the scientific committee of the International Conference on Sustainable Nanotechnology and Nanomaterials.

Please cite this article as: M. Udaybhaskar, S. Senthilkumar, G. Shanakr et al., Green synthesis and characterization of MgO nanoparticles from black vitex negundo leaf extract, Materials Today: Proceedings, <https://doi.org/10.1016/j.matpr.2022.12.087>

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INVESTIGATING STRENGTH CHARACTERISTICS USING NON-DESTRUCTIVE TESTS FOR CONCRETE WITH PARTIAL REPLACEMENT OF CEMENT WITH RICE HUSK ASH AND CERAMIC POWDER

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Abstract

In this research work, the concrete specimens are casted, cured and tested the specimens after 6 months to know the strength characteristics by performing non- destructive test. Therefore, this research work seeks to investigate the strength characteristics by performing non – destructive tests like rebound hammer and ultra sonic pulse velocity test. In the present study, an attempt has been made to investigate the strength parameters of concrete made with partial replacement of cement by rice husk ash. Moreover, no such attempt has been made in substituting rice husk ash with cement for low/medium grade concretes (viz. M20, M30). The rice husk ash is replaced with cement at 15% and 20% proportions and the cubes are casted and cured for 7 days and 28 days. After curing period, the specimens are tested to know the strength and quality of the concrete specimens after 3 and 6 months from the casting. The obtained values are compared with the standard values of the conventional mix

Keywords: strength analysis, concrete, husk ash and ceramic powder

Introduction

Concrete is used extensively in various types of construction works as a construction material among civil engineers around the world for decades. However, the deterioration of reinforced-concrete structures is recognized as a major problem worldwide. Over a period of time, as these structures become older, certain degradation or deterioration with resultant distress manifested in the form of cracking, splitting, delaminating and corrosion is found in them. The strength of the structure should also be observed after the post construction phase and this can be known by performing non – destructive tests. The most commonly used construction material in the world is concrete. The art of arriving at proper mix through a suitable combination of cement, aggregates, water and admixtures is referred as mix proportioning. The mix proportions should satisfy all the requirements to use of minimum possible cement content so that maximum economy is achieved. The purpose of concrete mix proportioning is to combine the available cementations materials, water, fine and coarse aggregates, and admixture such that the resulting mix will meet the particle requirement of strength and durability. Concrete mix design is arrived at by using certain relationships established from experimental data which afford reasonably accurate guidance to select the best combination of ingredients in getting desired properties. The large scale production of cement involves environmental problems on one hand on the other hand the unrestricted depletion of natural source. So, in order to fulfill the requirement the cement can be replaced with cementitious material. In this research work, the concrete specimens are casted, cured and tested the specimens after 6 months to know the strength characteristics by performing non- destructive test. Therefore, this research work seeks to investigate the strength characteristics by performing non – destructive tests like rebound hammer and ultra sonic pulse velocity test. In the present study, an attempt has been

made to investigate the strength parameters of concrete made with partial replacement of cement by rice husk ash. Moreover, no such attempt has been made in substituting rice husk ash with cement for low/medium grade concretes (viz. M20, M30). The rice husk ash is replaced with cement at 15% and 20% the cubes are casted and cured for 7 days and 28 days. After curing period, the specimens are tested to know the strength and quality of the concrete specimens after 6 months from the casting. The obtained values are compared with the standard values of the conventional mix.

Non-Destructive Tests

Nondestructive testing (NDT) is the process of inspecting, testing, or evaluating materials, components or assemblies for discontinuities, or differences in characteristics without destroying the serviceability of the part or system. In other words, when the inspection or test is completed the part can still be used. These destructive tests are often used to determine the physical properties of materials such as impact resistance, ductility, yield and ultimate tensile strength, fracture toughness and fatigue strength, but discontinuities and differences in material characteristics are more effectively found by NDT. Today modern nondestructive tests are used in manufacturing, fabrication and in- service inspections to ensure product integrity and reliability, to control manufacturing processes, lower production costs and to maintain a uniform quality level. During construction, NDT is used to ensure the quality of materials.

The following are the types of non-destructive tests:

Rebound Hammer, Ultra sonic pulse velocity, Magnetic particle testing, Liquid penetrant testing and Radiographic testing

The objective of the present investigation is to investigate

The workability for concrete mixes of grade M20, M30 by replacing mass of cement with rice hush ash and ceramic powder at different proportions. The strength characteristics are determined by using non-destructive tests like rebound hammer, ultra sonic pulse velocity on concrete mixes of grade M20, M30 by replacing mass of cement with rice hush ash and ceramic powder at 15% and 20%.

The scope of present study includes the Laboratory tests on cement, fine aggregate, coarse aggregate, rice husk ash and ceramic powder. Mix design of concrete mix for M20 and M30 grades as per IS 10262: 2009 was done by mixing rice husk ash and ceramic powder at 15% and 20% to weight of cement content. The specimens were casted and cured for 7 and 28 days curing in Potable water. The specimens are tested after 6 months from the date of casting to know the strength characteristics by performing non – destructive tests. From the test results we can know the strength and the quality of the concrete.

Literature review

Ganesan.k., rajagopal.k and thangavelu.k(2007) The utilization of waste materials in concrete manufacture provides a satisfactory solution to some of the environmental concerns and problems associated with waste



AN EXPERIMENTAL STUDY TO INVESTIGATE STRENGTH PROPERTIES OF CONCRETE WITH PARTIAL REPLACEMENT OF CEMENT WITH METAKAOLIN AND CERAMIC POWDER

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Abstract

Concrete is the prime material used in any RCC structure. In this generation, we can observe the rapid urbanization and industrialization which was leading to the increase in the construction of the projects. So, in the construction of any structure concrete is main material to be used in completion of structure. Concrete is a mixture of several ingredients but the main ingredient is cement which helps to bind together of remaining ingredients. But, the cost of cement is high but it is important in concrete. So, in order to fulfill the requirement the cement can be replaced with cementitious material i.e. metakaolin and ceramic powder. In this research work, the concrete specimens are casted and cured with portable water. An experimental study is made on the nature of metakaolin and ceramic powder and its influences on the properties of fresh and hardened concrete. In the present study, an attempt has been made to investigate the strength parameters of concrete made with partial replacement of cement by metakaolin and ceramic powder. Moreover, no such attempt has been made in substituting metakaolin and ceramic powder with cement for medium grade concrete i.e. M30. The compressive, tensile and flexural strength are investigated when 5%, 10%, 15%, 20%, 25%, 30% and 40% replacement of cement by metakaolin and ceramic powder in weight. The specimens are cured for 7 days, 28 days and are tested for compressive, tensile and flexural strength. The obtained results are compared with the conventional concrete mix.

Introduction

Concrete is a supreme material for the construction and majorly used worldwide which has resulted in large scale manufacturing of cement. It is proven through various researchers that production of cement produces heavy environmental pollution because of the emission of CO₂ gas. This is quite hazardous. Hence it became crucial and essential for the researchers to find a better alternative that can be eco-friendly and reasonable in every way. Hence, they have started working on the economical and eco-friendly substitute of cement which can partially supplement to cement minerals or raw materials without compromising the strength parameter. We can call such kind of material as supplementary cementing materials or a pozzolanic or mineral admixture. In this generation, we can observe the rapid urbanization and industrialization which was leading to the increase in the construction of the projects. So, in the construction of any structure concrete

is main material to be used in completion of any RCC structure. Concrete is a composite material composed of water, aggregate, and cement. Concrete is used in large quantities; almost everywhere mankind has a need of structure. It is very tough to find an option for concrete in construction, which is

main ingredient is cement which helps to bind together of remaining ingredients. But, the cost of cement is high but it is important in concrete. So, in order to fulfill the requirement the cement can be replaced with cementitious material i.e. Metakaolin and ceramic powder.

Indian ceramic production is 100 Million ton per year. In ceramic industry, about 15%-30% waste material generated from the total production. This waste is not recycled in any format present. However, the ceramic waste is durable, hard and highly resistant to biological, chemical, and physical degradation forces. The Ceramic industries are dumping the powder in any nearby pit or vacant spaces, near their unit although notified areas have been marked for dumping. This leads to serious environmental and dust pollution and occupation of a vast area of land, especially after the powder dries up so it is necessary to dispose the Ceramic waste quickly and use in the construction industry. As the ceramic waste is piling up every day, there is a pressure on ceramic industries to find a solution for its disposal. The use of this material as replacement offer cost reduction, energy savings, arguably superior products, and fewer hazards in the environment.

Use Of Cementitious Material In Concrete:

The threat to the ecology has lead to lot of investigation to the utility of industrial by product as supplementary cementations material for making concrete. Fly ash, Rice husk ash and Silica fume, metakaolin and ceramic powder are well known industrial by product that are being extensively used as supplementary cementations materials. The advancement in the cement technology has resulted in the development of high grade of cement which has enable engineers to use of lesser cement. This is possible by the use of the supplementary cementations materials. The use of metakaolin and ceramic powder as a mineral admixture in the concrete has been increasing. It is known that concrete incorporating metakaolin and ceramic powder restrain heat of hydration and has superior resistance to alkali-silica reaction, chloride ion penetration and sulphate attack.

A well-proportioned mixture generally shows improved mobility, cohesiveness, strength and durability. The beneficial effects of these materials are well documented. Water cement ratio is a 3 important factor in mix design. Primary requirement of good concrete is a satisfactory compressive strength in its hardened state.

Necessity Of the Present Work:

As per the literature available it is said that in near future there will be shortage of cement itself. Hence cement will not be available for concreting purpose as extraction of rock materials leading to the pressure on the earth's surface. The world at the end of the 21st century that has just been left behind was very different to the world that its people inherited at the beginning of that century. The latter half of the last century saw unprecedented technological changes and innovations in science and engineering in the field of communications, medicine, transportation and



DESTRUCTIVE ASSESSMENT OF M30 GRADE CONCRETE USING CEMENTITIOUS MATERIALS AT DIFFERENT CURING METHODS

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Abstract

Rapid urbanization and industrialization in this generation are putting tremendous pressure on building and infrastructure development. So, due to this development in the field of construction the demand for construction material is increasing day by day with corresponding increase in concrete production. In this present study, an attempt is made to replace the cement with other cementitious materials i.e industrial wastes like fly ash, GGBS. The specimens are casted by replacing cement with industrial wastes at different mix properties i.e 0%, 5%, 10%, 15%, 20%, 25%, 30% at different curing methods. After curing at different curing methods like water curing and wet covering the specimens are testing for compressive strength and split tensile strength. The obtained results are compared with conventional concrete mix to know the strength characteristic.

Introduction

Rapid urbanization and industrialization in this generation are putting tremendous pressure on building and infrastructure development. So, due to this development in the field of construction the demand for construction materials is increasing day by day with corresponding increase in concrete production. Concrete is the prime material used in any RCC structure. In this generation, we can observe the rapid urbanization and industrialization which was leading to the increase in the construction of the projects.

Concrete is a composite material composed of water, aggregate, and cement. Concrete is used in large quantities; almost everywhere mankind has a need of structure. It is very tough to find an option for concrete in construction, which is durable and economic. Concrete is a mixture of several ingredients but the main ingredient is cement which helps to bind together the remaining ingredients. But, the cost of cement is high but it is important in concrete. So, in order to fulfill the requirement the cement can be replaced with cementitious material i.e. GGBS and fly ash.

In this present study, an attempt is made to replace the cement with other cementitious materials i.e. industrial wastes like fly ash, GGBS. The specimens are casted by replacing cement with industrial wastes at different mix proportions at different curing methods and cured for 7 days and 28 days. After curing at different curing methods like water curing and wet covering the specimens are tested for compressive strength and split tensile strength. The obtained results are compared with conventional concrete mix to know the strength characteristics.

Aggregates:

Aggregates are the inert materials that are mixed in fixed proportions with a binding material to produce concrete these act as fillers or volume increasing components on the hand and are responsible for strength, hardness and durability of the concrete on other hand. Most important constituents of the concrete which occupy 70 to 80% of the total volume of

economy. Aggregates can be classified in many ways. But, classification of aggregates based on shape and size are as follows.

Coarse aggregates:

When the Aggregates is sieved through 4.75mm sieve, the aggregate retained on the sieve is called coarse aggregates. It is well recognized that coarse aggregates plays an important role in concrete.

Fine aggregates:

When the aggregate is sieved through 4.75 mm sieve, the aggregates passed through the sieve, it is called as fine aggregates. Natural sand is generally used as fine aggregates, silt and clay are also comes under this category.

Cement:

Cement, in general is the binding material used in building and civil engineering works. Cements are finely grounded powders that when mixed with water set to hard mass. Concrete is a mixture of paste and aggregates. The paste composed of cement and water, coats the surface of coarse and fine aggregates. Through a chemical reaction called hydration, the paste hardens and gains strength to form the rock like mass known as concrete. Cement mainly consists of the following ingredients.

- Lime (calcium oxide, Cao)
- Silica (silicon dioxide, SiO₂)
- Alumina (Aluminum oxide, Al₂O₃)
- Iron oxide (Fe₂O₃)
- 2 to 3% of Gypsum

Fly ash:

Fly ash is a fine powder that is a byproduct of burning pulverized coal in electric generation power plants. Fly ash is a pozzolanic substance which contains aluminous and siliceous material that forms cement in the presence of water. When mixed with lime and water, fly ash forms a compound similar to Portland cement. This makes fly ash suitable as a prime material in blended cement, mosaic tiles, and hollow blocks, among other building materials. When used in concrete mixes, fly ash improves the strength and segregation of the concrete and makes it easier to pump.

Literature Review

[1] w t talib khalid(2010). In this present study cement is replaced with GGBS and FLY-ASH at different percentages like 20%, 30% and 20%, 30%, 40% at different curing periods. The curing periods are 3, 7 and 28 days. After completion of curing periods compressive and split tensile tests are conducted on those specimens. Test results are more than the normal concrete mix and these materials cheap and economical also.

[2] patel, dr. (smt.), et.al (2014). Ceramic products made up with different raw materials like china clay, ball clay, potash feldspar, dolomite, talc and

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NUMERICAL ASSESSMENT OF NEW PRECAST CONCRETE CONNECTIONS UNDER CYCLIC LOADS
AN EXPERIMENTAL STUDY ON M30 GRADE OF CONCRETE BY PARTIAL REPLACEMENT
OF COARSE AGGREGATES WITH JHAMMA BRICKS

SANGARU RAJ KUMAR, CH. SAI KIRAN

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Abstract

Industrialization is increasing day by day which was leading to the faster completion of any civil engineering projects. So, due to this development in the field of construction the demand for construction materials is increasing day by day with corresponding increase in concrete production. Concrete is the prime material used in any RCC structure. So, in the construction of any structure concrete is main material to be used in completion of any RCC structure. This project focuses on the coarse aggregate in concrete. The other material will be used to replace the coarse aggregate of rock in typical concrete. This will include burn brick or jhamma brick. This material was chosen because of their availability. The burn brick is available from brick manufacturing area. Also in brick-making, a large number of bricks are rejected due to nonconformity with the required specifications. One such major nonconformity is the distorted form of brick produced due to the uneven temperature control in the kiln. These rejected bricks can also be a potential source of coarse aggregate. This would not only make good use of the otherwise waste material but would also help alleviate disposal problems. In this present study, an attempt is made to replace the coarse aggregates with the waste material i.e. jhama bricks. The concrete specimens of M30 grade are casted by replacing coarse aggregates with jhama bricks at different mix proportions i.e 0%, 10%, 20%, 30%, 40%, 50%, 60% and 80% After curing, the specimens are tested for compressive strength and split tensile strength. The obtained results are compared with conventional concrete mix to know the strength characteristics.

Introduction

Concrete is the favorite choice as a construction material among civil engineers around the world for decades. It is preferred for its better performance, longer life and low maintenance cost Concrete has been the prime ingredient of any RC structure construction. There have been many advancements in types of structures but, concrete cannot be neglected. Concrete is the most used material in today's world in the all types of civil engineering works in the construction industry. In the development of the constructions, concrete which plays a major role. The ingredients in which are used for the manufacturing of the concrete are as follows.

- Aggregates
- Cement
- Water

In this present study, an attempt is made to replace the coarse aggregates with the waste material i.e. jhama bricks. This project will present the effects of Jhama Class Brick inclusion on the mechanical properties of the

concrete matrix in wet and hardened state properties. The concrete specimens of M30 grade are casted by replacing coarse aggregates with jhama bricks at different mix proportions i.e. 0%, 10%, 20%, 30%, 40%, 50%, 60%, 80%. After curing, the specimens are tested for compressive strength and split tensile strength. The obtained results are compared with conventional concrete mix to know the strength characteristics.

Aggregates:

Aggregates are the inert materials that are mixed in fixed proportions with a binding material to produce concrete these act as fillers or volume increasing components on the hand and are responsible for strength, hardness and durability of the concrete on other hand. Most important constituents of the concrete which occupy 70 to 80% of the total volume of concrete. They give 2 body to the concrete, reduce shrinkage and effect economy. one of the most important factors for producing workable concrete is good gradation of aggregates. Good grading implies that a sample fractions of aggregates in required proportion such that sample contains minimum voids. Aggregates can be classified in many ways. But, classification of aggregates based on shape and size are as follows.

- Coarse Aggregates
- Fine Aggregates


Coarse aggregates:

When the Aggregates is sieved through 4.75mm sieve, the aggregate retained on the sieve is called coarse aggregates .It is well recognized that coarse aggregates plays an important role in concrete . we have gravel, cobble and boulders come under this category. The maximum size aggregate used may be Depend upon some conditions. Coarse Aggregates typically occupies over one – third occupy of volume of concrete.Coarse aggregates occupy 70 to 80% of the concrete. In general, 40 mm size aggregate used for normal strength and 20 mm size is used for

high strength concrete. So, the aggregates has to be strong and enough strength to bear the loads. The size ranges of various coarse aggregates are given below. Table 1

Coarse Aggregates	Size
Fine Gravel	4 mm – 8 mm
Medium gravel	8 mm – 16 mm
Coarse gravel	16 mm – 64 mm
Cobbles Cobbles	64 mm – 256 mm
Boulders	>256 mm

so depending upon the type of construction the size of the coarse aggregates


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NUMERICAL ASSESSMENT OF NEW PRECAST CONCRETE CONNECTIONS UNDER CYCLIC LOADS
EXPERIMENTAL INVESTIGATION ON MECHANICAL AND DURABILITY PROPERTIES OF NANO FLY ASH
AND STONE POWDER DUST AS A PARTIAL REPLACEMENT IN CONCRETE

Pericherla Manasa, Vbhargavi

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Abstract

When the cement, sand, and aggregate are properly bound together, the compressive strength of the concrete is enhanced as well. Stone powder dust is a by-product of stone crushing operations that is used as a filler. Stone powder dust is used in the construction of the W.B.M. road to ensure good bonding of the coarse aggregate. Nano fly ash is a waste product produced by thermal power plants that is produced in huge quantities. When nano fly ash is combined with cement, the resulting mixture has the same properties as cement. The majority of the study was carried out using nano fly ash as a substitute for cement. To investigate the behavior of concrete, stone powder dust and nano fly ash are mixed together and placed in a concrete mix. When the cement, sand, and aggregate are properly bound together, the compressive strength of the concrete is enhanced as well. Stone powder dust is a by-product of stone crushing operations that is used as a filler. Stone powder dust is used in the construction of the W.B.M. road to ensure good bonding of the coarse aggregate. Nano fly ash is a waste product produced by thermal power plants that is produced in huge quantities. When nano fly ash is combined with cement, the resulting mixture has the same properties as cement. The majority of the study was carried out using nano fly ash as a substitute for cement. To investigate the behavior of concrete, stone powder dust and nano fly ash are mixed together and placed in a concrete mix.

Introduction

Concrete is an extraordinary and key structural material in the human history. Increase in construction activities has led to an increase in demand for various raw materials in concrete. Concrete's versatility, durability, sustainability, and economy have made it the world's most widely used construction material. The production of one tone of cement consumes about 1.5 tones of raw materials, 80 units of electric power apart from one tone of CO₂ released into the atmosphere. Out of the total CO₂ emissions (from various sources) worldwide, cement industry contributes about 7% of CO₂ emissions. Annual cement production rate of the world is increasing very much year by year. The production can be reduced if demand is reduced. Demand can be reduced by using supplementary cementing materials and other material which reduce Portland cement content of concrete. The properties of concrete can also be increased by using by-products and natural wastes as supplementary cementing material. Lot of energy and cost can also be saved by using these natural wastes and industrial by-products as partial replacements to OPC and production of fly ash is nearly equal to the production of cement.

For effective utilization of fly ash and stone powder in cement in India, using stone powder and fly ash in Nano form as partial replacements to

cement is very important than other usage of these supplementary cementing materials. The fly ash is majorly used in the manufacture of cement. [9, 20] For efficient consumption of ashes in cement in India, using cow dung ash and fly ash in the form as partial replacements of cement is very important than other usage complementary cementitious materials. There are both technical advantages and communal benefits in using Stone Powder Dust and fly ash in concrete. Because cow dung ash contains large amount of calcium potassium and phosphorus which is assimilate into the construction by absorption from the soil during the expansion of Stone Powder Dust and fly ash is a pozzolanic material which behaves like cement in presence of lime and water.

Pozzolanic materials used in concrete:

Pozzolano are generally defined as siliceous or siliceous and aluminous materials which are not cementitious by themselves but in finely divided form, when react with lime in the presence of water, produce compounds possessing cementitious properties.

Fly Ash: It is the residue generated from combustion of pulverized coal under controlled conditions in boilers and collected from flue gases using electrostatic precipitators.

NANO FLY ASH:


Fly ash in Nano form has more specific surface, than ordinary fly ash. [4,5] Due to its form and specific surface area, the Nano fly ash fills the voids and makes the interfacial transition zone in concrete denser and stronger. Due to the improved properties of interfacial transition zone the concrete properties like strength and durability will also be improved. Utilization of waste materials in cement and concrete industry reduces the environmental problems of power plants and decreases electricity generation costs.

Stone powder dust:

In Quarry places there are number of stone polishing industries and huge quantities of fine powder from the grinding of rough stones during the process of polishing the stones to convert them into polishing stone suitable for lying of flooring and other such works is generated. [2, 17, 18] This powder is finer than cement. At present this powder is not used for constructive use. Stone powder dust obtained from grinding of stones in an inert material. As the powder is finer than the cement, this can be used as filler in concrete. The stone powder dust generated during the process of cutting and polishing is used as the partial replacement of cement.

Litarature Review

[1] Abhishek Jain (2013) et al have conducted experimental studies on


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INVESTIGATING STRENGTH CHARACTERISTICS USING NON DESTRUCTIVE TESTS FOR M20 GRADE CONCRETE BY PARTIALLY REPLACING CEMENT WITH RICE HUSK ASH AND CERAMIC POWDER

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Abstract

Concrete is used extensively in various types of construction works as a construction material among civil engineers around the world for decades. However, the deterioration of reinforced concrete structures is recognized as a major problem worldwide. Over a period of time, as these structures become older, certain degradation or deterioration with resultant distress manifested in the form of cracking, splitting, delaminating and corrosion is found in them. The strength of the structure should also be observed after the post construction phase and this can be known by performing non – destructive tests. Concrete is a mixture of several ingredients but the main ingredient is cement which helps to bind together of remaining ingredients. But, the cost of cement is high but it is important in concrete. So, in order to fulfill the requirement the cement can be replaced with cementitious material. In this research work, the concrete specimens are casted, cured and tested the specimens after 6 months to know the strength characteristics by performing non- destructive test. Therefore, this research work seeks to investigate the strength characteristics by performing non – destructive tests like rebound hammer and ultra sonic pulse velocity test. In the present study, an attempt has been made to investigate the strength parameters of concrete made with partial replacement of cement by rice husk ash and ceramic powder. Moreover, no such attempt has been made in substituting rice husk ash and ceramic powder with cement for low grade concrete (i.e. M20). The rice husk ash and ceramic powder is replaced with cement at 15% and 20% proportions and the cubes are casted and cured for 7 days and 28 days. After curing period, the specimens are tested to know the strength and quality of the concrete specimens after 3 and 6 months from the casting. The obtained values are compared with the standard values of the conventional mix.

Introduction

Concrete is used extensively in various types of construction works as a construction material among civil engineers around the world for decades. However, the deterioration of reinforced-concrete structures is recognized as a major problem worldwide. Over a period of time, as these structures become older, certain degradation or deterioration with resultant distress manifested in the form of cracking, splitting, delaminating and corrosion is found in them. The strength of the structure should also be observed after the post construction phase and this can be known by performing non – destructive tests. The most commonly used construction material in the world is concrete. The art of arriving at proper mix through a suitable combination of cement, aggregates, water and admixtures is referred as mix proportioning. The mix proportions should satisfy all the requirements to use of minimum possible cement content so that maximum economy is achieved. The purpose of concrete mix proportioning is to combine the available cementations materials, water, fine and coarse aggregates, and admixture such that the resulting mix will meet the particle requirement of strength and durability.

In this research work, the concrete specimens are casted, cured and tested the specimens after 6 months to know the strength characteristics by performing non- destructive test. Therefore, this research work seeks to investigate the strength characteristics by performing non – destructive tests like rebound hammer and ultra sonic pulse velocity test. In the present study, an attempt has been made to investigate the strength parameters of concrete made with partial replacement of cement by rice husk ash. Moreover, no such attempt has been made in substituting rice husk ash with cement for low grade concrete (i.e.M20). The rice husk ash and ceramic powder is replaced with cement at 0%,15% 20%.

Non-destructive tests:

Nondestructive testing (NDT) is the process of inspecting, testing, or evaluating materials, components or assemblies for discontinuities, or differences in characteristics without destroying the serviceability of the part or system. In other words, when the inspection or test is completed the part can still be used. These destructive tests are often used to determine the physical properties of materials such as impact resistance, ductility, yield and ultimate tensile strength, fracture toughness and fatigue strength, but discontinuities and differences in material characteristics are more

manufacturing, fabrication and inservice inspections to ensure product integrity and reliability, to control manufacturing processes, lower production costs and to maintain a uniform quality level. During construction, NDT is used to ensure the quality of materials.

The following are the types of non-destructive tests:

- Rebound Hammer
- Ultra sonic pulse velocity
- Magnetic particle testing
- Liquid penetrant testing
- Radiographic testing

Ceramic powder:

Ceramic powder is obtained by grinding the discarded tiles made only with the ball clay from the Ceramic industry. Ceramic powder consists of ceramic particles and additives that improve a powder's ease of use during component fabrication. Additives include a binding agent to hold the powder together after compaction and a release agent to enable a compacted component to be easily removed from the compaction die. The significant features and properties of ceramic powder are the particle size and its size distribution, the particle composition, the amount of die release agent and its composition, the amount of binder and its composition, and the type and amount of contamination.

Literature Review

Earlier studies on utilization of rice husk ash in civil engineering works:

[1] Archana Karolina and Archana Tiwari (2013) to meet out the rapid infrastructure development a huge quantity of concrete is required. Unfortunately, India is not self sufficient in the production of cement, the main ingredient of concrete and the demand exceeds the supply and makes the construction activities very costlier. Hence, currently, the entire construction industry is in search of a suitable and effective waste product that would considerably minimize the use of cement and ultimately reduce the construction cost. Fly Ash, Silica Fumes, Egg shell etc. Amongst these RHA and Fly Ash are known to have good prospects in minimizing the usage of cement. India produces about 122 million tons of paddy every year. About 20-22% rice husk is generated from paddy and 20- 25% of the total husk becomes as "RICE HUSK ASH" after burning. Each ton of paddy produces about 40 Kg of rice husk ash. This paper evaluates how different proportions of rice husk ash (RHA) and fly ash (FA) added to concrete may influence its physical and mechanical properties. Samples with dimensions of 150 X 150 mm were tested; with 0%, 10%, 20%, 22.5% and 25% of cement is replaced by total mass of waste (RHA+FA).

[2] Jose james and Subba rao.m (1986) Effect of lime:silica ratio on the kinetics of the reaction of silica with saturated lime has been investigated. Below C/S=0.65 the reaction does not proceed to completion and even in the presence of a large excess of silica only 90% lime is consumed. A parameter, lime reactivity index, has been defined to quantify the reactive silica present in rice husk ash. The product of the reaction between rice husk ash and saturated lime is a calcium hydrosilicate. The fibrillar structure and the hollow tubular morphology of the fibres, have been explained by a growth mechanism, where the driving force is osmotic pressure.

[3] Seshu D.R and Seshagiri Rao M.V.2002 2 The mechanical properties of high strength concrete with different replacement levels of ordinary Portland cement by Rice Husk Ash. The standard cubes (150mmX150mmX150mm), cylinders (150mmdiaX300mm height) and prisms (100mmX100mmX500mm) were caste. In all 144 specimens with M40 and M50 grade mix cases were caste and tested. The strength effect of High-strength concrete of various amounts of replacement of cement viz., 0%, 5%, 10%, 15% with Rice Husk Ash of both the grades were compared with that of the high-strength concrete with out Rice Husk Ash. The compressive strength at 7, 28 and 56 days have been obtained. The results of the mechanical properties of the rice husk ash at 28 days have 11 shown quite encouraging and interesting results. The optimum replacement of rice husk ash found to be 10% in both the grades of the concrete.

Earlier studies on utilization of ceramic powder in civil engineering



EFFECT OF ALCOFFINE ON HIGH STRENGTH CONCRETE

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Abstract

There have been enormous researches going on the use and utilization of industrial, agricultural and thermoelectric plant residues in the production of concrete. Production of high-strength concrete (HSC) plays an important role with different pozzolanic materials like fly ash, condensed silica fume, blast furnace slag, rice husk ash etc. There has been increase in the consumption of mineral admixture by cement and concrete industries. This rate is expected to increase day by day. The presence of mineral admixture in concrete is known to impart significant improvement in workability and durability in concrete. The present study involves the use of mineral admixture "ultrafine slag" as a cementitious material replacement and to evaluate the threshold limit of replacement of cement. Main aim of this work is to evaluate the compressive strength, flexural strength and split tensile strength of High strength concrete by partial replacement of cement (0,5,10,15 and 20%) with ultra-fine slag (Alcoffine 1203) for M60 grade of concrete. OPC of 53 grade from single source is used in this investigation. Different durability analysis of concrete incorporating ultrafine slag was also carried out. The combination of ordinary Portland cement (OPC) with alcoffine was found to increase the compressive strength of concrete on all ages when compared to concrete made with ordinary Portland cement alone and has showed excellent durability characteristic.

Keywords: High strength concrete, alcoffine, supplementary cementitious materials

Introduction

Concrete is a hard material that has cementitious medium with in which aggregates are embedded. With the development of concrete technology, the use of concrete in the construction industries have gained pace. Cement is one of the major constituents of concrete. Materials other than cement used in the manufacture of concrete are coarse and fine aggregates, admixtures and water. Cement is an extremely important constituent to concrete as it binds together other materials. The raw materials used for the manufacture of cement consist mainly of lime, silica, alumina and iron oxide. These oxides interact with one another in the kiln at high temperature to form four major complex compounds. Concrete is strong and tough material. Reinforced concrete resists cyclones, earthquakes, blast and fires much better than timber and steel if designed properly.

The quality of concrete is determined by its mechanical properties as well as its ability to resist deteriorations. Hardened concrete can be considered to have three distinct phases i.e. the hardened cement paste (HCP) or matrix, the aggregate and the interfacial or transition zone (TZ) between HCP and the aggregate. For optimum performance all the three phases should be considered explicitly. The HCP is about 30% to 40% of the volume of concrete and aggregates constitute 60% to 70% of the volume. Fig shows the different constituents of concrete. Concrete also contains air which is

categories depending on its density and strength as recommended by IS456:2000. The aggregates used in making concrete contribute mainly to its density.

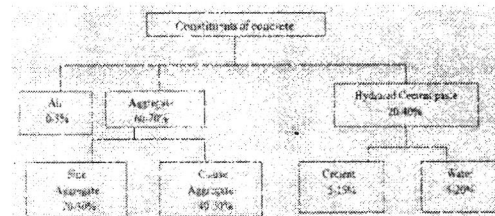


Fig 1: Constituents of Concrete

Table with 3 columns: Classification, Maximum Strength (MPa), and Type. Rows include Ordinary Concrete (<20, Low strength), Standard Concrete (20-40, Medium strength), and High strength Concrete (40-70, High strength).

Table 1: Classification of concrete based on strength (Source: IS: 456-2000)

The strength of concrete is the most important characteristic as it has strong relationship with quality. Strength as a parameter is used for controlling as well as evaluating other properties of concrete because of its relationship with durability and dimensional stability.

Various parameters that affect the strength of concrete are shown in Fig. Specimen parameter includes dimension, moisture state and shape of a specimen. Most important factor which affect the strength is the porosity which can result from either the matrix, aggregate, or the interfacial transition zone. Porosity in turn is influenced by w/c ratio, degree of hydration and air content

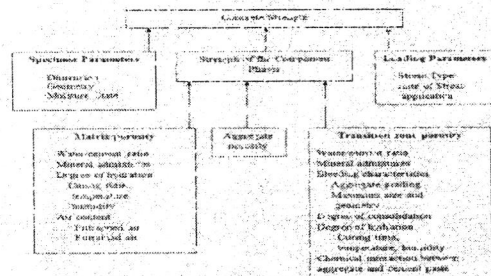


Fig 2. Factors affecting the strength of concrete

Environmental concerns:

Cement conservation is the first step in reducing the energy consumption and green house-gas emissions. Resource productivity consideration will require us to minimize Portland cement use while meeting the future demands for more concrete. This must be the top 6 priority for a viable concrete industry. Except for blended Portland cements containing mineral additions, no other hydraulic cements seem to satisfy the setting, hardening,

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Optimizing the Efficiency of MANETs Through an ANFIS- Based DSR Routing Protocol for MANETS.

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Abstract:

MANETs are baseless networks without infrastructure, consisting of nodes with mobility which are dynamic in nature. Routing protocols are available for helping node to node communication. In this context, Performance of the network by increasing QoS parameters like throughput and minimizing delay and network load has become essential factor. This paper emphasizes on the execution of ANFIS approach for enhancing the performance of the DSR routing protocol in MANETs. The suggested adopts Fuzzy Inference System in optimizing the QoS parameters. Experimental results acquired from MATLAB and OPNET 14.5 simulator specifies that ANFIS based DSR showed better performance by increase in Throughput 10.69%, decrease in Network Load by 11.43% and decrease in delay by 6.30%.

Keywords: DSR, ANFIS, Fuzzy DSR

DOI Number: 10.14704/nq.2022.20.13.NQ88295 **Neuro Quantology 2022; 20(13):2365-2369**

1. Introduction:

Mobile-Ad-Hoc-Network is a regionalize type of Ad Hoc network typically mobile in nature. It doesn't have a proper topology due to its dynamic in nature and has no access point. MANETs are dynamic by its inbuilt characteristic features, frequent routing changes due to its mobility and low energy resources. Unlike other networks, these networks though they are demanding and portable in nature the routing has become challenging issue. This routing according to the requirement, the related protocol selection has become crucial point.

MANET protocols are classified as Pro-active (Table-Driven), Re-active (On-Demand) and amalgam of routing Protocols (Hybrid-Model) as shown in the Figure1

In Pro-active Protocols for routing, network of nodes conserves the routing information in the table and updates at time interval. This continuous activity results in more overhead. DSDV, OLSR, WRP, etc. are the examples of Proactive Routing Protocols. In Reactive Routing Protocol, the routing table is updated only when it required. That is whenever sender wants to send data to receiver, it broadcasts RREQ packets or destination route and sends accordingly. This results to less overhead. AODV, DSR are the examples of Reactive Routing Protocols. Hybrid Routing Protocol is a combination of both Proactive and Reactive Routing Protocol. ZRP is an example to Hybrid Routing Protocol.

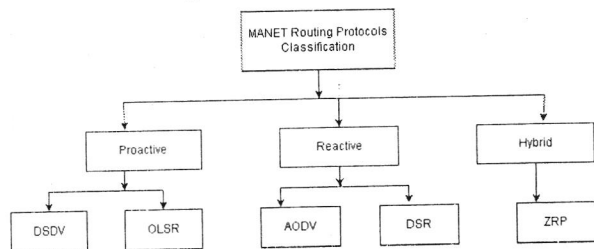


Figure1: MANET Routing Protocols Taxonomy

2. Literature Review:

Sabina Barakovic, et al [1] in their paper showed comparative performance evaluation of reactive routing protocol in MANETs. AODV and DSR routing protocol are simulated and analyzed using NS-2 and proved that DSR outperforms AODV and DSDV protocol under high mobility.

Vivek Sharma et al [2] proposed an algorithm using Adaptive Fuzzy Inference System (ANFIS) by taking inputs hop count, energy and delay to select the optimal route such that improve



SKIN CANCER CLASSIFICATION USING CONVOLUTIONAL NEURAL NETWORKS

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Published Date: 07-12-2022

ABSTRACT: Skin lesions are various abnormalities on the skin that appear on a patient due to many different reasons. These can be due to the exposure of skin to harmful UV rays or they can be mere birthmarks or an uncontrolled growth in the skin tissue, defined as cancer. Not all skin lesions are cancerous and therefore it is important to identify them at an early stage which can potentially improve the survival rate in case the pigment on skin turns out to be cancerous. The proposed system helps the user to identify if the spots on the skin are cancerous or benign by using CNN. The model was trained on HAM10000 ("Human Against Machine with 10000 training images") dataset using convolutional neural network. The dataset comprised of seven different classes of skin lesions and augmentation was used to increase the number of images in the dataset. Due to limited number of images in the dataset, to achieve better results, the model was trained using transfer learning with Mobile Net adapted for mobile use. The model was then integrated into the android application which could be used to detect whether the skin lesion is cancerous or benign using the camera of the mobile device. Moreover, the proposed system has been packed into a real-time used to detect if the spots on skin are cancerous or not by using the mobile device of the user.

Topics covered include: Convolutional Neural Networks (CNNs); deep learning frameworks; security concerns.

1. INTRODUCTION

Skin cancer is an emerging global health problem with 123,000 melanoma and 30,00,000 non-melanoma cases worldwide each year. The recent studies have reported excessive exposure to ultraviolet rays as a major factor in developing skin cancer. The most effective solution to control the death rate for skin cancer is a timely diagnosis of skin lesions as the five-year survival rate for melanoma patients is 99 percent when diagnosed and screened at the early stage. Considering an inability of dermatologists for accurate diagnosis of skin cancer, there is a need to develop an automated efficient system for the diagnosis of skin cancer. visual examination of skin cancer is

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Video Shot Transition Detection Using Convolutional Neural Network (CNN), Euclidean Distance Algorithm and Change Point Analysis Algorithm

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Abstract: Multimedia streams usage increases nowadays and that creates the scope of development of efficient and effective methodologies for manipulating different image databases storing this type of information. Any content-based access to video data always requires parsing of each video stream into its building blocks. Any video stream consists of a number of shots; each one is a sequence of frames. Shot boundary detection is the very first step in any video stream-analysis system and there are numbers of proposed techniques are available for solving the problem of shot boundary detection, but the major limitation to them are their inefficiency, lack of reliability and less trustworthy. Here, proposes to learn shot boundary detection end-to-end, from pixels to final shot boundaries. For training such a model, we created our own dataset and automatically generated transitions such as cuts, dissolves and fades. Here we propose a Convolutional Neural Network (CNN) and Euclidean Distance algorithm and Change Point Analysis algorithm to make the system more efficient and accurate in nature.

Keywords: Convolutional Neural Network (CNN), Euclidean Distance algorithm.

I. INTRODUCTION

All digital video information consists of a series of many frames or images. Over the years image processing technology has developed comprehensive and complete measures and techniques to index, store, edit, retrieve, sequence and present video material. To develop any content-based manipulations on digital video stream information, this information must first be structured and broken down into different components. The basic structural building blocks are called shots and the boundaries between shots need to be determined automatically

A shot in video stream information may be defined as continuous images (i.e. frames) from a single camera at a time. A shot boundary is defined the gap between two shots. A cut is a type of shot boundary where one shot abruptly changes to another shot. An example of a shot cut is where the last frame in one shot is followed by the first frame in the next. Examples of other different types of shot boundary are fades (where the frames of the shot gradually change from or to black), dissolves (where the frames of the first shot are gradually morphed into the frames of the second) or wipes (where the frames of the first shot are moved gradually in a horizontal or vertical direction into the frames of the second).

The main reason why automatic shot boundary detection is difficult is the fact that any kind of shot transition can be easily confused with camera and object motion which occurs in video anyway. A shot with much object motion throughout the frame such as a sports or action shot or a clip from a music video, can cause the false recognition of a shot boundary. Conventionally, if there exist frames that are merged by the adjacent shots but belong to neither of them, the transition is called a gradual one; otherwise, it is called a cut.[1]

II. PROPOSED ARCHITECTURE

For any video indexing, browsing, retrieval, representation and other video analysis technologies video shot boundary detection is the first and fundamental step. To identify the transition between every two adjacent shots, video shot boundary detection is the process.

1. Pixel Comparison: In Pixel Comparison, if there two frames are significantly different and to count the number of pixels that change in value more than any threshold. This method is sensitive to camera motion. We note that manually adjusting the threshold is unlikely to be practical. This commonly used matching process duplicates the process used to extract motion vectors from an image pair. Then the pixel differences for each region were sorted, and then the weighted sum of the sorted region differences. The Gradual transitions were detected by generating a cumulative difference measures from consecutive values of the image differences. During dissolves and fades, this chromatic image assumes a reasonably constant value:

Lung Cancer Prediction Using Machine learning Methods

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Abstract

Predicting Lung Cancer at an early stage is very important and expensive. Machine Learning is useful to solve this at a very low cost. This tends to Solve Prediction, Classification problems, and many more in real-time. The Author has developed a comparative Classification Model for Pulmonary Carcinoma. Nowadays, Pulmonary carcinoma cases are increasing rapidly due to direct or indirect Effects such as Smoking, Alcohol Consumption, HeredityEtc. This study has been made based on the following ML algorithms, such as Multi-Layer perception (MLP), Logistic Regression (LR), Random Forest Classifier (RF), Ada Boost Classifier, and Support Vector machine (SVM). The outcomes of this comparative analysis are shown with the help of the Python Library.

Keywords: *Multi-Layer perception (MLP), Logistic Regression (LR), Random Forest Classifier (RF), and Support Vector machine (SVM).*

1. Introduction

PULMONARY CARCINOMA

Pulmonary Carcinoma is considered a life-threatening illness and a key concern for high mortality in today's world. Lung disease impacts people to a more considerable degree and, as expected, now ranks 7th in the death rate index, resulting in 1.5 percent of the world's overall mortality rate.

Pulmonary Carcinoma originates from the lung and spreads to the brain. Any of the symptoms associated with patients include dry cough, extreme chest pain, breathlessness, weight loss, etc. They are looking at cancer cultivation, and it leads doctors to worry further over smoke and second-hand smoking as if they were the leading causes of Pulmonary Carcinoma.

1, 2. Treatment of Pulmonary Carcinoma
Includes Surgery, Radiation therapy, Chemotherapy, Immunotherapy, Despite this diagnosis of Pulmonary Carcinoma, the mechanism is fragile, and the doctor may only know the condition at an early level. Predicting before the final stage of Cancer is very important to control the mortality rate with significant control. The survival rate of pulmonary Carcinoma is very promising with proper diagnosis and treatment. The mortality rate of Pulmonary Carcinoma ranges from person to person. It depends on sex, age, fear, yellow fingertips, alcohol, variations in historical smoking habits, and fitness. Machine learning is used to

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Transfer Learning for Image-Based Plant Disease Detection Using Residual Network

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Abstract: Cassava, Africa's second-largest source of carbohydrates, is a critical food security crop farmed by smallholder farmers due to its ability to tolerate harsh conditions. This starchy root is grown on at least 80% of Sub-Saharan African family farms, although viral infections are a major source of low yields. Cassava disease can only be identified by trained professionals because the symptoms among numerous varieties of disease are quite similar and each leaf might carry multiple diseases, making the work even more challenging. As a result, acquiring labelled training data is time-consuming and costly. An automated tool could assist professionals diagnose disease more accurately and allow farmers in remote regions to monitor their crops without the assistance of specialists.

Keywords: Cassava, Viral infections

1. INTRODUCTION

Cassava (*Manihot esculenta* Crantz) is a staple food grown in Sub-Saharan Africa. Cassava is a plant that contains good source of protein and vitamins, particularly in the leaves. It is frequently used as a rice substitute [1]. Cassava is grown on a small, medium, and large scale by farmers across Africa under a variety of environmental and climatic conditions. Cassava is a food security crop for smallholder farms, especially in low-income, food-insecure areas, because it produces sufficient yields in low-fertility soils and with irregular rainfall patterns. However, the main challenge is that cassava plants are susceptible to a variety of diseases and lesser-known viral strains [2].

As leaves are an important element of the plant and serve as a site for photosynthesis, diseased leaves will have an impact on crop output. The phloem tissue is responsible for transporting the photosynthesis results to the other components of the plant. The growth of the stems and tubers will be flawless if the plant's leaves are healthy and the photosynthetic process is carried out appropriately. However, if disease attacks the leaves and disrupts the photosynthetic process, the growth of stems and tubers is also disrupted, resulting in low-quality crop yields [3]. However, due to economic constraints and the inability of an expert to identify disease in cassava leaves in a timely manner, farmers are unable to respond to disease concerns in cassava leaves promptly and properly. As a result, we require an intelligent system capable of resolving these issues. This project focuses on identifying four diseases that frequently affect cassava leaves: Cassava Bacterial Blight (CBB), Cassava Brown Steak Disease (CBSD), Cassava Green Mite (CGM), and Cassava Mosaic Disease (CMD). The dataset is available in TensorFlow datasets. The labelled images are split into training set, test set and validation set. The number of images per class are unbalanced with the two disease classes CMD and CBSD having seventy percent of the images.

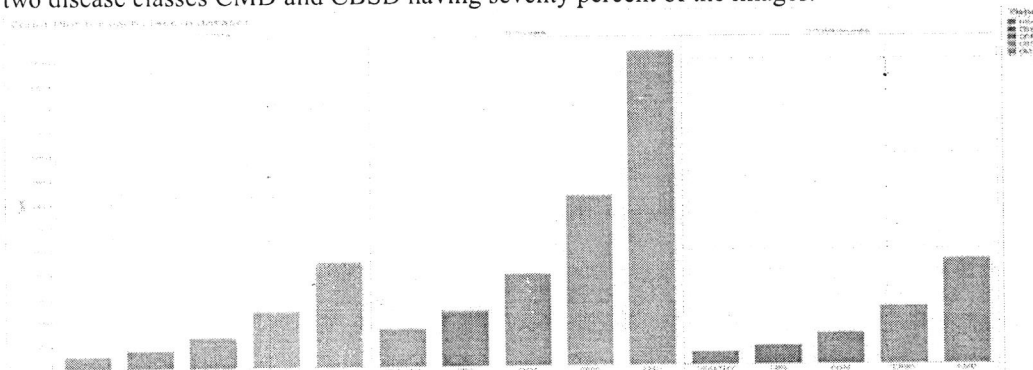
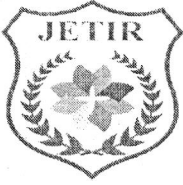


FIG 1 TheGraph depicts the count of images for each class

1.1 DISEASES

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10 KW GRID CONNECTED ROOFTOP SOLAR PV POWER PLANT

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ABSTRACT:

With the intent of reducing carbon footprints on the energy used for a Medical unit in Visakhapatnam, Andhrapradesh, India has been considered by going with a 10KW Solar PV Power Plant connected to Grid with a Grid Intertied Inverter to convert generated DC power from Solar to AC Power. Thus, latest of Photovoltaic Technology called Mono PERC has been used with 470Wp PV Module has been utilized to generate desired energy from the system.

Proposed plant is at a location in Gajuwaka, Visakhapatnam District with 10 Deg Fixed tilt and detailed aspects of Engineering, procurement and construction were considered to generate minimum 14000KWh per year and the same is captured within this paper.

1. INTRODUCTION

The electricity sector in India supplies the world's 6th largest energy consumer, accounting for 3.4% of global energy consumption by more than 17% of global population. the Energy policy of India is predominantly controlled by the Government of India's, Ministry of Power, Ministry of Coal and Ministry of New Renewable Energy and administered locally by Public Sector Undertakings (PSUs).

About 70% of the electricity consumed in India is generated by thermal power plants, 21% by hydroelectric power plants and 4% by nuclear power plants. More than 50% of India's commercial energy demand is met through the country's vast coal reserves. The country has also invested heavily in recent years in renewable energy utilization, especially wind energy. In 2010, India's installed wind generated electric capacity was 13,064 MW. Additionally, India has committed massive amount of funds for the construction of various nuclear reactors which would generate at least 30,000 MW. In July 2009, India unveiled a \$19 billion plan to produce 100,000 MW of solar power by 2023.

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STATCOM based Power Quality Improvement in Hybrid Power System

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Date of Submission: 01-01-2023

Date of Acceptance: 08-01-2023

ABSTRACT—The utility load now faces new demands in relation to power quality, voltage stabilization, and effective energy use as a result of the increased use of distributed energy sources in the electricity system. The sources of renewable energy that are regarded as being the most reliable are wind and solar. Due to the unpredictability of the wind and solar irradiance availability, however, the solitary operation of either photovoltaic or wind energy systems does not offer a highly stable source of electricity production. As a result, a variety of wind and solar power generation systems can create a very promising and dependable supply of electricity. A hybrid wind and photovoltaic system model has been presented in this paper. The distant users of this type of technology can benefit much from it.

In remote or island locations where grid integration is not very cost-effective, this kind of technology is quite helpful and advantageous. But connecting power electronics to DG systems results in very serious power quality issues, like harmonic production and reactive power adjustment, which disrupt the power distribution system. In this paper hybrid wind-PV generation system simulation model is given. Analysis is done on the system's performance in grid connected mode. Total harmonic distortion (THD) calculations at various wind speeds were used to assess the power quality of the wind-SPV hybrid system. Utilizing STATCOM has enhanced the power quality of this hybrid system.

Keywords—Total Harmonics Distortion(THD), STATCOM, Hybrid system, Distributed Generation(DG),Solar Photo. Voltaic(SPV).

I. INTRODUCTION

The use of sustainable energy sources for the production of electricity can only be a feasible alternative to fossil fuels in light of the recent rising worries over environmental problems brought on by fossil fuels. Air flow and sunlight are two abundant

sources of renewable energy. These two are regarded as the leading renewable energy sources. On the other hand, the main drawback of sunlight and air movement is that they cannot supply constant irradiation or constant speed air movement, respectively. Therefore, it cannot be used independently when a constant supply of electricity is needed. A new development in renewable energy technology is the blending of various energy sources with energy storage devices. Stand-alone wind and Solar Photovoltaic are two possible hybrid pairings. Since it makes use of the advantages of both solar and wind energy systems, the wind-SPV hybrid generation (WSPVHG) system with grid integration may be a viable option for producing electricity[2]. A hybrid system can lower the cost of electricity while still delivering high-quality power. Along with all of its advantages, the hybrid system also has some drawbacks; such as protection, synchronization, and power quality issues, but we will only focus on the latter here [1]. Voltage sag, harmonics, and power factor can all be used to assess the quality of power. In this study, we compute harmonics to evaluate the hybrid wind-PV system's power quality [9]. This essay follows with descriptions of the hybrid system in part II and D-STATCOM modeling in section

II. HYBRID RENEWABLE ENERGY SYSTEM MODEL

A hybrid renewable energy system is one in which the system's electrical load must be supplied by two or more different power producing sources. Given that it makes use of the advantages of both solar and wind energy systems, a wind-PV hybrid generating system with grid integration could be a viable option for producing electricity [3]. This combination will provide the finest solution in standalone as well as grid connected mode to satisfy the growth in load demand. The grid-connected mode increases overall system efficiency and reliability while lowering costs. During

Improving the Maximum Power Point Tracking in Wind Farms with PID and Artificial Intelligence Controllers for Switched Reluctance Generators

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Abstract— One of the most significant forms of renewable energy is wind power, which has been the subject of in-depth study to develop more dependable and efficient ways. Numerous research on wind energy have been conducted in the recent years. The most often discussed subjects include maximum power point tracking (MPPT) systems, kinds of generators used in wind turbine applications, control and stability of wind plants. Recent research on the VSWT has centered on developing MPPT technology. For a switched reluctance generator (SRG) powered by a variable speed wind turbine to generate the most power. By detecting the wind speed and adjusting the wind turbine shaft speed for the ideal tip speed ratio, MPPT is accomplished for the wind turbine. By altering SRG's turn-off angle. The asymmetrical half-bridge converter system connected to the SRG. The MATLAB/Simulink environment is used to simulate the systems. This project presents PID and Artificial intelligent controllers as MPPT system. The PID and intelligent controllers regulate the SRG's output power. The outcomes demonstrate that ANN controller outperforms the FL controller and PID controller in terms of accuracy and efficiency.

Keywords- The maximum power point tracking(MPPT), wind turbine, Switched reluctance generator (SRG),variable speed wind turbines(VSWT), proportional integral derivative (PID)Artificial neural network controller (ANN), Fuzzy logic controller (FLC).

1. INTRODUCTION

Fixed speed wind turbines (FSWT) and variable speed wind turbines(VSWT). are the two primary categories of wind turbines. The FSWT are easy and affordable. In contrast to FSWTs, the VSWT is more efficient despite being more complex and costly [1-3]. The development of MPPT technologies has been the focus of recent VSWT research. With MPPT, the wind generator can absorb the greatest amount of energy from the wind, resulting in high efficiency [4-8].

Traditional controllers, such as proportional integral (PI), proportional derivative (PD), proportional integral derivative (PID) controllers, provide benefits such as robustness and broad margin stability [9]. Nonetheless, these controllers have several drawbacks, including high sensitivity to parameter changes and high sensitivity to nonlinear dynamic systems [10-15]. Intelligent controllers, on the other hand, operate a system without using dynamic equations and relying on some critical system attributes. Because of its advantages, the fuzzy logic controller (FLC) and artificial neural network controller (ANNC) have recently seen widespread use [16][17].

Several wind turbine generators have been investigated, including the induction generator (IG), doubly fed induction generator (DFIG), wound field synchronous generator (WFSG), permanent magnet synchronous generator (PMSG), and switching reluctance generator (SRG) [18]. For FSWT, IGs is employed. Because of its benefits, particularly in transitory situations, the DFIG is an appropriate candidate for VSWTs [19]. In recent years, the SRG has been studied in order to apply for the VSWT and achieve optimum power efficiency [20-24]. This is a great option since it has several advantages such as mechanical durability, high efficiency, performance across a wide range of speeds, high power density, and high fault tolerance. Based on the SRG's performance at various wind speeds, this generator may be a suitable replacement and function more efficiently. In wind turbine applications, the SRG also produces electricity from wind power without a gearbox. Recently, the SRG has been employed in the VSWT to get maximum power due to these benefits [25-27]. The common research to achieve optimum efficiency in varying wind speeds is looking into the switching of SRG and the best turn-on and turn-off angle of the SRG asymmetric half bridge [28]. To manage the SRG, rotor location is crucial. To optimize the amount of electricity sent to the grid, wind rotational speed control is explored [29].

Solar PV Based Multi Level Inverter For BLDC Motor Drive

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Date of Submission: 12-03-2023

Date of Acceptance: 22-03-2023

ABSTRACT: Because of the BLDC motor's straightforward construction, high efficiency, low maintenance requirements, and low cost, it is commonly used in high power and low voltage applications. Also, they produce a lot of power and have a lot of torque for their size. Although being a DC motor in this instance, the BLDC motor functions on an alternating current source and is driven directly from the AC supply port. The main drawback is that any disruptions in the source will have an impact on the applications that use BLDC motors in the industrial context. So, to avoid this, there should be a converter and an inverter intermediary between the motor and the source. . The BLDC motor can be driven using one of three different techniques. 1.Pulse width modulation-based two-level inverters (PWM). 2. An inverter with many operating levels. 3. A neutral clamping multilevel inverter. The recommended inverter may reduce the harmonic content of the output signal by employing a multicarrier PWM method. It has the ability to produce excellent motor currents. In this case, it is possible to precisely control the speed of a BLDC by using a three-level diode clamped multilevel inverter.

The main objective of this study is to show how to use an inverter to operate a BLDC drive, where the harmonics can be reduced. A device that changes voltage into current is called a diode clamped multi-level inverter. This research gives a more effective alternative to this approach. It is possible to evaluate the overall effectiveness of the system by modelling the operation of the neutral clamp multilevel inverter-based drive system using the MATLAB Simulink software package. The entire application will stop working and producing output in the event of a power outage. So, under these conditions, it is necessary to turn to renewable energies in order to strengthen the reliability of electricity supply and output. Several renewable energy sources are accessible, but due to their advantages, solar PV systems should be chosen over conventional power

supplies. A diode clamped multi-level inverter was used to drive the BLDC.

Keywords:BLDC, Multi-level Inverter, Neutral Point Clamped Diode, THD, Multicarrier PWM, firing circuit.

I. INTRODUCTION

Using a BLDC motor has many benefits, including great efficiency, little maintenance needs, lighter weight, and a significantly more compact design. BLDC motors have been widely used in a range of industrial applications for many years due to their inherent advantages. These are the most suitable motors for applications requiring rapid dynamic response in speed response due to their high efficiency and ease of regulation across a wide speed range. The motor drive industry is seeing an increase in the use of motor drive topologies based on Multi-Level Inverter (MLI) technology. The ability to construct multilayer voltage waveforms with equipment with a lower voltage rating is one advantage of three-level topologies, which would be a significant benefit. Whereas Pulse Width Modulation (PWM) techniques aim to produce sinusoids with varying voltage and frequency, multilevel inverters' goal is to generate sine values utilising discrete voltage levels. Sinus voltages are produced from discrete voltage levels using multilevel inverters. It is feasible to create three-phase sinusoids for a range of voltages by giving the MOSFETs various gate signals. PWM has been implemented for inverters in a number of different ways that have been created. The two most popular methods for creating PWM for multilevel inverters are Sine-Triangle PWM (SPWM) and Space Vector PWM (SVPWM) (SVPWM). A type of pulse width modulation called multilevel sine triangle PW comparing values. The speed control of different motors using multilayer inverter systems has been the subject of several earlier investigations, all of which have been published. Some of them have memberships in this group. Yousif Ismail Al

Some Aspects on Design and Performance Evaluation of Integrated Three Phase Solar PV-UPQC

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Date of Submission: 13-04-2023

Date of Acceptance: 17-04-2023

ABSTRACT: This paper dealt the design and operation of an integrated, unified three-phase solar photovoltaic power quality conditioner (PV-UPQC). Shunt and series voltage compensators are coupled back to back with a shared DC-link to form the PV-UPQC. Besides with adjusting for load current harmonics, the shunt compensator also extracts energy from a PV array. For better performance of the PV-UPQC, a moving average filter-based improved synchronous reference frame control is employed to extract the load active current component. Grid voltage sags and swells are just two examples of the power quality issues that the series compensator corrects. During sag and swell circumstances, the compensator injects voltage that is either in phase or out of phase with the point of common coupling (PCC) voltage. The suggested solution combines the advantages of producing clean energy with bettering electricity quality. By simulating in Matlab-Simulink under a nonlinear load, the steady state and dynamic performance of the system are assessed. A scaled-down laboratory prototype is then used to test the system's performance in the presence of various disturbances, including load unbalance, PCC voltage swings, and irradiation fluctuation.

KEYWORDS: UPQC, power quality, shunt-series compensator, solar-PV, PCC.

I. INTRODUCTION

There is an emphasis on clean energy generation is increasing day by day and the solar PV generation is such clean energy generation sources available abundantly. The power quality of electric power has become an important issue in electrical power system operation in the last few years. But due to the intermittent nature of the PV energy sources and also the increased penetration of such systems particularly in weak distribution systems leading to voltage quality problems like voltage sags/swells which eventually lead to the grid instability. With the advancement of semiconductor technology there is an increased penetration of power electronic loads which draws nonlinear currents

these currents cause voltage distortion problems at the point of common coupling in the distribution systems. These voltage quality problems lead to frequent false tripping of power electronic systems, malfunctioning and false triggering system components. Power quality issues at both load side and grid side are the major problems faced by modern distribution systems integrated with the three-phase renewable Grid interfaced source.

An unified power quality conditioner (UPQC) has been considered in this work. The solar PV Integrated with UPQC has numerous advantages such as improving power quality of the grid, protecting critical loads from grid side disturbances. UPQC is the combination of both shunt and series compensators. The shunt compensators compensates for the load power quality problems such as load current harmonics and load reactive power and also extracts power from the PV-array by using Maximum Power Point Tracking (MPPT). The series compensator protects the load from the grid side power quality problems such as voltage sags/swells by injecting appropriate voltage in phase with the grid voltage. The major task in the control of UPQC is the generation of reference signal. The techniques for the reference signal generation are broadly classified in to time-domain and frequency domain techniques. The commonly used techniques are instantaneous reactive power theory (p-q Theory), synchronous reference frame theory (d-q theory) and instantaneous symmetrical component theory. The main issue with the use of synchronous reference frame theory is that during load unbalanced condition double harmonic component is present in the d-axis current. This result in poor dynamic performance of UPQC. To mitigate this a moving average filter (MAF) is used to filter the d-axis current to obtain fundamental load active current. The Present Work Concentrated on Analysis of an UPQC integrated with Solar PV using MAF along with MPC to improve the

Load Frequency Control in Two Area Power System Using Fuzzy Interface

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Date of Submission: 12-03-2023

Date of Acceptance: 22-03-2023

ABSTRACT: The load-frequency control (LFC), which employs speed control, is used to re-establish the balance between load and generation in each control region. The basic objective of LFC is to minimize the steady state error and transient deviations to zero beforehand. This paper explored LFC utilizing traditional Controllers and Fuzzy Inference System (FIS) for two area system. With the aid of the MATLAB/Simulink programme, the outcomes of the two controllers are compared. Results of comparisons between traditional controllers and fuzzy inference systems are shown.

KEYWORDS: Fuzzy Inference System (FIS), Conventional Controller, and Load Frequency Control

I. INTRODUCTION

Due to its growing demand, electricity generation is crucial nowadays. The system's dynamic behaviour is dependent on disturbances and adjustments to the operating point. The output of the system, which must have a steady frequency and maintain the scheduled power, determines the quality of the electricity produced in power plants. As a result, load frequency control (LFC) is crucial for the power system's ability to deliver dependable and high-quality electricity. Conventional controllers like PI, PD, and PID can provide control actions for a single operating condition, but in real-world situations, the parameters are constantly changing. Thus, it is challenging to set up the necessary improvements to achieve zero frequency deviation. Thus, it is essential to offer automatic correction.

In order to improve dynamic performance, a variety of control strategies have been used in the design of load frequency controllers. When comparing the many load frequency controller types, conventional controllers are the most prevalent and frequently used. Although conventional controllers are easy to implement, they

produce significant frequency variation. To improve performance, the majority of state feedback controllers based on linear optimum control theory have been presented. Fixed gain controllers fail to deliver the optimal control performance under a variety of operating situations because they are built for nominal operating conditions. So, it is desirable to monitor operating circumstances and use up-to-date parameters to compute the control in order to maintain system performance close to its maximum. Self-adjusting gains settings in adaptive controllers have. It is well known, this load frequency management issue was what caused the Northern grid breakdown. This is a result of excessive grid usage in addition to excessive generation. It caused a blackout that affected all eight states in the practically entire Northern area. This was caused by the traditional controllers' faulty control actions, and despite the warnings being sent, some states continued to consume more electricity than they needed. In order to detect load changes and stabilise the frequency deviation, an adaptive control system is needed. In this research, a fuzzy inference system (FIS) technology is used to deliver an automatic control action. Results are presented after a comparison between the suggested controller and the traditional controller.

II. SINGLE AREA POWER SYSTEM

There are several categories used to categorise modern power systems. For instance, there are five regional grids in India, including the Eastern, Western, Northern, Southern, and North-Eastern grids. These regional areas are all commonly connected to their surrounding regions. Tie-lines are the transmission lines that link one area to its neighbouring territory. These tie-lines are used to distribute power between two places. Load frequency control, as the name suggests, controls the power flow between various locations while maintaining a consistent frequency.

Design and Fabrication of Solar Refrigerator by using Peltier Module

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Abstract - In present days we are using high electricity consuming refrigerators, which also produce CFC pollutant (Chlorofluoro carbon gas) into the atmosphere by usage of different refrigerants in refrigerators. Which type of pollutant is most effect the environment and humans health by increasing global warming. So we are find the solutions to the global warming problem, by coming up with a solutions to eliminate the emission of CFC's. Our project is to design and fabrication of portable solar Refrigerator by using pelier module, which eliminates the emission of CFC's by neglecting the refrigerants, is very ecofriendly and also cheaper when compared to the present day Refrigerators. The fabrication of a portable refrigerator works on solar energy and thermoelectric effect. This portable solar powered refrigerator can be used in deserts, rural areas where electricity is not available throughout the day, and also be used in medical applications like prevention of medicines, injections. This is also arranged with a charging device which can be used for lighting and to charge electronic devices like mobile phones.

1. INTRODUCTION

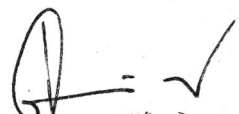
Refrigeration is a process of removing heat from a low temperature reservoir and transferring it to a high-temperature reservoir. The work of heat transfer is traditionally driven by mechanical means, but can also be driven by heat, magnetism, electricity, laser, or conditioning. Refrigeration has had a large impact on industry, lifestyle, agriculture, and settlement patterns. The idea of preserving food dates back to at least the ancient Roman & Chinese empires. This has resulted in new food sources available to entire populations, which has had a large impact on the nutrition of society. Electricity generation is the leading cause of industrial air pollution in the country. Most of our electricity comes from coal, nuclear, and other non renewable power plants. Producing energy from these resources takes as every to all on our environment. Polluting our air, land. Renewable energy sources can be used to produce electricity with fewer environmental impacts. It is possible to make electricity from renewable energy sources without producing CO₂. This refrigerator will be suitable for cooling purposes meant for small objects and will have a relatively small chilling time as compared to the normal to the refrigeration systems, also for the backup. This refrigerator will be attached to a dynamo based charging system which will maintain the smooth operation of refrigerator in case of non availability of solar power. In most of the rural areas of our country, the

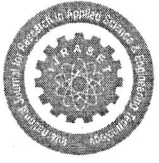
electric supply is either sporadically available or not available at all. The most severe effect of this problem is on the Primary Health Care Centres. Due to no electricity, most of the PHC's do not maintain adequate supply of medicines and equipment which need to be kept in a cold environment. So in case of any emergency, the patient is to be referred either to the town or city hospital which results in loss of precious time and may prove fatal for the patient. Due to the difficulty in disposal of Chlorofluoro carbon (CFCs) and Hydro Chlorofluoro carbons (HCFCs), conventional sources are being used so as to decrease the environmental degradation. The temperature difference is developed between the two junctions of the thermocouple due to which one side of the peltier becomes cold and other hot. In refrigerator space, cool side of the thermocouple model is used whereas hot side is used for the rejection of heat to atmosphere with the help of heat sink. The size of the peltier varies from very small to very large size according to the requirement and application.

2. Body of Paper

The circuit of the refrigerator is made quite simple and convenient so that in case of any fault, it can be easily dissembled and can be repaired without any major changes to the design. The peltier unit are connected to the 12 volt DC supply. The cooling fans mounted on the heat sink are connected with the power supply of 12 DC volts.

A switch is placed in the incoming positive dc supply and an LED along with a 1 Kilo-ohm resistance is placed after the switch in parallel with the supply. The circuit diagram of the circuitry of the refrigerator is as shown in the following figure.


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A Methodology for Evaluating Delay and Power on Binary Counters and Block Level Optimization

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Abstract: In this paper, slice level optimization is performed on the conventional 6:3 counter and then finally integrated all the slices to the original one. Slice level optimization corresponds to partition the given circuit in to number of blocks such that final integration can be done effectively. Considering individual blocks Power testing and delay testing, results were taken by triggering the activities which lead to power consumption and all possible critical paths were also tested for every individual block and then comparison is made. Test vectors are also applied such that every consecutive cycle output is complemented, so that low to high and high to low delays can be captured with in a smaller number of test vectors. Identical strategy is applied to measure the power because for every two cycles only one power consuming event occurs on a single node under consideration. The proposed 6:3 counter is 36% faster than the conventional one and also saves the power for about 56%. Utilizing more NAND, NOR and AOI gates instead of AND, OR gates have led to the achieved optimization.

Keywords: Counter, Delay Testing, Power Testing, Slice level Optimization, Test Vectors

I. INTRODUCTION

Row compression technique is used in [1,2,3] for integrating the partial products effectively. Delay is more in these counters due to needing an equality circuit in the maximum delay taking paths. Compressor of size 5:2 and 4:2 is proposed in [4,5]. Date selector is used to improve the delay in maximum delay taking paths in[6,7]. Low power compressor was proposed in[8], Adder architecture was proposed in [9]. In this paper, we present a slice level optimization method on the existing design[10] and then every slice is optimized to the best possible extent with respect to the power and delay and finally integrated. Slice will be most probably a sub – circuit with primary inputs and intermediate outputs or it may be with intermediate inputs and also intermediate outputs or at the final slice we can imagine a slice as having intermediate output as the primary input and primary output as the output. Every slice, in detail power and delay testing were performed. Delay testing corresponds to examining all possible critical paths for low to high and high to low of that output. Power testing corresponds to examining for the all possible low to high of that particular node.

II. LITERATURE REVIEW [10]

In stacker 3-bit, the basic hardware required is carry logic for output Y1 and three input AND gate and three input OR gate for rest of the outputs. Output will be generated with in two levels and the delay will be the summation of two input AND and three input OR delays. First output will be “0” if all the three bits are zero, second output will be “0” if any two of the inputs are zero and the final output will be “0” if any one of the inputs is zero.

All the blocks were analyzed for it’s performance. Every block in this design will be optimized for the VLSI constraints. Detailed delay and power analysis will be done on the existing and also new design is proposed.

In 16T Block, It is used for generating the output S for the 6:3 counter and two such copies of hardware is needed to realize the circuit. Delay is the Summation of not gate in the first level, AND gate in the second level and OR gate in the third level. There are six power consuming internal and external nodes which may lead to more power consumption. XOR is needed with two inputs and those inputs are 16T BLOCK with inputs as H2, H1, H0 as one input and one more 16T BLOCK with inputs as I2, I1, I0. Output being produced is S for 6:3 counter.

In 26T Block, this block requires two levels of logic to generate the output, where in the first level it requires AND gates and in the second level it requires OR gate. There are four power consuming internal and external nodes at a time out of eight power consuming nodes. It is used to generate C2 output of 6:3 Counter. In 34T Block, this block is used to generate C1 output of 6:3 Counter. It requires five levels to produce the output, where it needs AND, OR, NOT, AND and OR in the levels starting from one to five. 6:3 Counter requires six levels to produce the output S, three levels to generate C2 output and six levels to produce C1 output. There are 48 power consuming internal and external nodes in the circuit.

Development and Analysis of InGaAs Nanowire Junctionless MOSFET with 10 nm gate length

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Abstract—The device performance of nanowire junctionless MOSFET (NW-JL-MOSFET) with InGaAs as core material in the sub-10 nm regime is examined by a device simulator, namely ATLAS. The focus is on gate-all-around nanowires with InGaAs core. These devices are further examined by adding gate-stack (high-k dielectric + oxide) method. It is observed that optimal selection of structure parameters of InGaAs NW-JL-MOSFET attains higher drain current and optimal performance. This proposed architecture also provides better switching speed of the structure. The gate dielectric material optimization of the structure is attained via broad device simulation. In this manuscript, a literature is carried for the short channel effects like subthreshold swing, I_{on}/I_{off} ratio, Threshold voltage and drain induced barrier lowering (DIBL). The InGaAs device has a better threshold voltage and I_{on}/I_{off} ratio, according to simulation data.

Keywords—Nanowire, Junctionless, MOSFET, Compound Material, Subthreshold Swing (SS), High K dielectric, gate all around (GAA)

I. INTRODUCTION

Gate All Around (GAA) Field Effect Transistor (FET) using silicon nanowire has appeared as a high performance device to down-scale the upcoming nanoscale semiconductor device due to higher packaging density, best gate controllability, as well as good potential to counter Short Channel Effects (SCEs) [1-3]. Although with all the advantages, GAA nanowire FET has a disadvantage of high series resistance occurring as an abrupt junction develops between densely doped source-drain with minutely silicon body [4-7]. The idea for such problem is the formation of Junctionless (JL) nanowire FET [7]. Due to carrier transport mechanism, the JLFET based devices are addressed as accumulation mode devices. However, the conventional FET based devices are simply named as inversion mode devices. The JFET is developed by heavily doping of the source, drain and channel regions uniformly throughout [8]. However due to heavily doping of the channel, the JL-nanowire undergoes a problem such as minimum drive current (as of less carrier mobility) [9] or less transconductance [7, 9, 10]. JL nanowire FET possesses higher sensitivity due to heavy doping towards random dopant fluctuations (RDFs) [11, 12]. A solution to these problems, as proposed by Ramond et.al. [13], is GAA charge plasma dopingless FET nanowire. On introducing an n/p-type in pure type silicon, development of source-drain region becomes feasible with usage of suitable work functions. This concept removes doping requirement and clears doping control issues, namely sharp doping fluctuation and doping profile. Charge plasma is then applied to bi-polar transistors [14, 15], tunnel FET (TFET)

[15] and MOSFET [16, 17]. A charge-plasma device produces a reduced thermal expenditure and provides better drive current, sub-threshold slope, as well as on-off current ratio. It further gives highly immune structure towards varying parameters in RDF in comparison to junctionless counterparts [16]

The performance of III-V materials and their interfaces has advanced, making the manufacturing of miniaturized III-V transistors a viable option [12], [17]. We examine ultra-scaled nanowire GAA transistors with InGaAs core in this paper. The scaling limit of SiO₂ as a gate dielectric (2 nm) also prevents device shrinkage. Quantum mechanical tunneling [7] forces this limit. The problem is handled by stacking high-k dielectric layers on top of SiO₂ layers [10-13] demonstrates the gate-stacked (GS) DM gate silicon on insulator MOSFET for improved performance.

The construction of multiple gate FET (MGFET) and 3-D structures say dual gate (DG), Omega/FinFET and GAA-FETs got an upper edge over the planner structure with sharp CMOS-scaling. In addition, the GAA-based MOSFET is regarded as final entity for downscaling of device less than 50 nm [5] that provides higher packing density, steeper sub-threshold slope as well as high current driving ability. The GAA-FET critically contracts SCEs because silicon layer is fully covered by entirely gate and thus, it controls channel's electrostatic potential effectively [5-9]. However, a scaled device got advantages of higher series resistance which occurs by construction of immediate source or drain junction [10,11]. The significant solutions like Schottky-Barrier source or drain or JL-MOSFETs are extensively proposed for investigations [12]. The JL-MOSFET shows highly doped source or drain or channel regimes in a uniform manner, thus show no PN junction creation within the source or drain and channel. However, highly concentrated doping of channel decreases the carrier mobility, which affect the device drive current as well as transconductance [13-15]. All these disadvantages made the doped source-drain regions to be replaced with Schottky Barrier metal source or drain that offers raised on-current as well as improvement in transconductance to JL MOSFETs

The low work function of the gate regime related to device drain has considerably lowered electric field and hot carrier effects. And, from the fabrication view point complicated and robustly amalgamated work-function of two metals considered as gate electrode. As it depends upon a ion etching method to patterning the non-matching gate metals together.

Also, the dual material gate technology has enhanced the device immunity over the SCEs [10]-[11]. The new

Hybrid Powered Electric Bicycle Using Solar & Dynamo

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Abstract: The hybrid powered electrical bicycle is a system that involves three different ways of charging a battery: Solar power, Dynamo and 240V ac charge. The power from these three modes is used to charge a battery with an electric motor running a bicycle. The hybrid powered bicycle is designed in such a way that the rider can have to modes of operating bicycle that can choose the bicycle to be driven completely with the electric motor or it can be driven manually.

Index Terms: Bicycle, Controller, Electric Motor, Throttle, Solar panel, Dynamo

I. INTRODUCTION- The electric bicycle offers a cleaner alternative to travel short-to-moderate distances rather than driving a gasoline-powered car. The price of crude oil has increased significantly over the past few years and there seems to be no turning back. The environment has also been more of a focus throughout the world in the past few years, and it seems that cleaner alternatives have been steadily on the rise with no end in sight. The electric bicycle is a project that can promote both cleaner technology as well as a lesser dependence on oil. It will run on clean electric power with the ability to recharge the battery 3 separate ways: through the 120 VAC wall source, by generating power through the pedals of the bicycle, and by solar-cell generative power. An extra benefit to building the electric bicycle is that it can also show the general public how much cheaper it would be to convert their regular bicycle into an electric bicycle rather than driving solely in their gas-powered vehicles. The greater importance of the environment in the world leads to an opportunity for students in our position. With the economy trying to get out of one of the worst depressions of the century, there are numerous opportunities for us to help out. This is our opportunity to contribute a greener and more efficient planet.

2. OBJECTIVES

These are the objective to be performed before continuing to proceed with this project.

- To reduce the pollution.
- To reduce the dependency on fossil fuel
- Easy utilization of renewable energy Sources.
- Environmentally Eco friendly and cheap.
- The battery and, we use dynamo to charge the battery when the bicycle is in motion.
- When there is no sunlight the battery provides for recharging using the wall charger by plugging into ordinary wall outlets, usually taking about three hours to recharge.
- The battery gives the required voltage to the hub motor mounted on the front wheel to run the bicycle.

3. CALCULATIONS

$$\text{Volt} = 36 \text{ V}$$

$$\text{Power} = 250 \text{ W}$$

3.1 POWER EQUATION


$$\text{Power} = I * V$$

Where

$$\begin{aligned} V &= 24 \text{ V} \\ P &= 250 \text{ W} \\ I &= 250/24 \\ &= 10.4166 \text{ A} \end{aligned}$$

3.2 TO FIND TORQUE OF THE MOTOR

$$\begin{aligned} T &= P * 60 / 2 * 3.14 * N \\ &= 250 * 60 / 2 * 3.14 * 300 \\ &= 7.96 \text{ N-m} \end{aligned}$$


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