

Comparative Study of Wind & Seismic Effect on a Multi-Storied Building

Uma Maheswari¹, Krishna Bhuvan Prasad²

¹Assistant Professor & HOD, Department of Civil Engineering, Chaitanya Engineering College

²U.G. Student, Department of Civil Engineering, Chaitanya Engineering College

Abstract

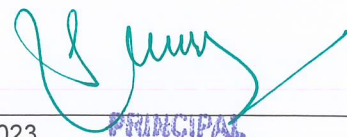
On demand of growing population construction of high-rise building is being made compulsory for avoiding land scarcity in future. Many major cities in India are very closer to the coastal area and almost all of them comes under live seismic zone which is big problem for high rise multistorey buildings. As manual analysis of such a complex structure is too hectic and time consuming, it is very necessary to find the solution on this issue instantly, the Wind and Seismic Analysis of the structure done by the softwares like STAAD-PRO and advanced software CSI ETABS. In this proposed study three different models were generated and analyzed by both softwares Staad-Pro and Etabs under the guideline of IS: 875-2015-Part III and IS: 1893-2016-Part-I. The response of G+5, G+20 and G+50 storey buildings has been studied. After comparing all the results we conclude whether earthquake or wind effect is critical.

Keywords: Etabs, Seismic Load, Staad-Pro, Wind Load

1. Introduction

Due to growing population and less availability of land, multistoried buildings are constructed which can serve many people in less area. In this modern era asurbanization increases availability of land isbecoming less, due to high population and cost of landbecome higher. To handle this problem, the onlysolution is to prefer high rise structure. In this thesis STAAD- Pro and ETABS software's is used to design and analyses any kind ofstructure in static and dynamic approach. However, these software's will give different design andanalytical results for the same structural configurations, this is due to their different analytical mechanism and the way they do analyse the structure. This raises a need to do a comparative study between these two software to know the real advantages and disadvantages of these software's

Rapid Industrialization causes migration of people to urban centers where job opportunities are significant. Therefore, land available for buildings to accommodate the migrated people is becoming scarce, resulting in rapid increase in the cost of land. The shortage of land and effective use of sites for new constructions in metropolitan areas plays very important role. This new generation of high-rise structures poses new challenges for structural engineering. High rise structures can be one that by virtue of height is affected by lateral forces due to wind or Earthquake or sometimes both.



PRINCIPAL

Experimental Investigation on Strength of Concrete using waste rubber tyres as Partial Replacement of Coarse Aggregate

Sunil Sammani¹, Anusuri. Uma Maheswari²

¹M. Tech Student, Department of Civil Engineering, Chaitanya Engineering College, Kommadi, A,P, India

²Assistant Professor & HOD, Department of Civil Engineering, Chaitanya Engineering College, Kommadi, A,P, India

ABSTRACT

The use of scrap tyre rubber in the preparation of concrete has been thought as an alternative disposal of such waste to protect the environment. In this study an attempt has been made to identify the various properties necessary for the design of concrete mix with the coarse tyre rubber chips as aggregate in a systematic manner. In the present experimental investigation, the M50 grade concrete has been chosen as the reference concrete specimen. Scrap tyre rubber chips, has been used as coarse aggregate with the replacement of conventional coarse aggregate Concrete is one of the most popular building materials. The construction industry is always increasing its uses and applications. Therefore, it is required to find alternative materials to reduce the cost of concrete. On the other hand, non-biodegradable waste i.e. water bottles, disposable glasses, shredded or crumbed rubber etc., is creating a lot of problems in the environment and its disposal becoming a great difficulty. The objective of this paper is to investigate the use of rubber pieces as coarse aggregate in the concrete. Concrete tested with varying percentages of rubber from 0 to 20% of normal aggregate. Strength tests and Slump cone test on concrete is carried out and comparative analysis is made.

Keywords: Compressive Strength, Crumb rubber, Flexural Strength, Rubberized Concrete, Split Tensile Strength.

INTRODUCTION

Waste-Tire rubber is one of the significant environmental problems worldwide. With the increase in the automobile production, huge amounts of waste tire need to be disposed. Due to the rapid depletion of available sites for waste disposal, many countries banned the disposal of waste tire rubber in landfills. It is recommended to use rubcrete in the production of curbs, roads, concrete blocks, and non-bearing concrete wall. Recycled waste tire rubber is a promising material in the construction industry due to its lightweight, elasticity, energy absorption, sound and heat insulating properties. In this paper the compressive strength of concrete utilizing waster tire rubber has been investigated. Recycled waste tire rubber has been used in this study to replace the coarse aggregate by weight using different percentages. Extensive investigations on wastage recycling are being implemented to minimize the environmental damages. Investigation shows that used tyre do not decompose under environmental condition, so burning is the only the choice for their decomposition, which causes harmful pollution. On the basis of experiments, we can use these crumb rubber tyres in concrete as coarse aggregate. However, this may decrease the compressive strength of concrete which will be compensated by adding nano-silica to the rubber containing concrete.

LITERATURE REVIEW

A. Y. Kamala Raju, N. Harish Kumar (2019), "Strength Performance of Crumb Rubber Concrete":

Compressive strength of M40 grade of concrete with 0.4 water to cement ratio was investigated; in which, crumb rubber shall be used at varying percentages 0%, 10%, 20%, 30% as a partial replacement to sand in concrete in order to find out the optimum percentage of crumb rubber. The concrete mix of M40 prepared was tested at 7, 14 & 28 days. The use of crumb rubber overcome pollution problem in the environment and it helps in the durability of concrete. On the basis of experimental investigation and the test results, following conclusions are drawn, the compressive strength increases up to 10% and then gradually decreases and workability of rubberized concrete decreases with increase in rubber content which could be compensated by increasing the dosage of chemical admixtures.



EFFECT OF SUGAR CANE JUICE ON PROPERTIES OF CEMENT

¹ANUSURI. UMA MAHESWARI, ²B. KRISHNA BHUVAN PRASAD, ³G. THULASI, ⁴T. MANIKANTA,
⁵M. GANESH

¹Assistant Professor & HOD, ^{2,3,4,5} B.Tech Students

¹Department of Civil Engineering,

¹Chaitanya Engineering College, Kommadi, Visakhapatnam, India

Abstract: Concrete is an inevitable material in the human being's life, because of its superior characteristics like strength and durability, but in certain situations it can't be used in all places because of low setting time of concrete. Sugar cane juice (SCJ) was investigated as a retarding agent in concrete production. Slump values of concrete and compressive strength of cement with partial replacement of water by sugar cane juice was also investigated. The cement cubes were prepared by replacing water with SCJ in the following proportions 0, 5, 10, 15, 20%. The cubes were cured, tested and the physical properties of interest in this study were determined. Results show that the final setting time of cement was delayed with increase in content of the SCJ in the cement mortar mix.

Index Terms – Compressive Strength, Setting Time, Slump Value, Sugarcane Juice.


I. INTRODUCTION

Concrete is a composite material typically produced from cement/binder, coarse aggregate, fine aggregate, water, and admixtures. The proportion of the constituent materials influences the fresh and hardened states and durability properties of concrete. Nowadays, a typical concrete mix design would, of necessity, include chemical and mineral admixtures for sustainability and eco-friendliness. Though chemical admixtures are relatively small in volume compared to other concrete constituents, they influence the concrete's properties, such as setting time (initial and final), consistency and strength. Admixtures are materials other than ingredients of concrete or mortar which are added to a batch before or during concrete mixing. In temperate climates, concreting can be challenging. Hence, retarders are used to slow down the setting time of cement-based materials. In our project we are using Sugarcane Juice as a retarding admixture.

II. LITERATURE REVIEW

[1] Rehan Ahmed Memon and Fareed Ahmed Memon (2022), "Experimental Study on the Effect of Sugarcane Juice as an Admixture on Fresh and Hardened Properties of Concrete":

This study was primarily based on enhancing the physical properties of concrete i.e Workability Setting time Compressive and Tensile strength by a natural admixture which is locally and easily available throughout the agricultural countries of world. To serve the purpose sugarcane juice was proposed to study in detail to find the best mixture with concrete. Mixed proportions of 0%, 5%, 10% and 15% of sugarcane juice with replacement of water were tested at 3, 7 and 28 days. For better and comparative results 3 samples of each proportion were casted and cured for desired curing periods and average of all specimens was analyzed as results. Overall results were very promising and beneficiary in every physical property of concrete. Best results for Setting time and workability were found at 15% replacement of water to sugarcane juice. Setting time increased up to 5hr as compared to the control mix. Workability was found to be collapsed at 15% replacement of water to the sugarcane juice. Compressive and Tensile strengths were found optimum at 10% replacement of juice. It was found that compressive strength increased up to 14% from the control mix and tensile strength increased up to 55% at 10% replacement of sugarcane juice.


PRINCIPAL
CHAITANYA ENGINEERING COLLEGE
Kommadi, Visakhapatnam-530 048

EXPERIMENTAL STUDY ON DURABILITY ASPECTS OF COCO-PEAT CONCRETE

Anusuri Uma Maheswari¹, A. Yaswanth², S. Bhanu Shanthi Priya³, K. Sailaja⁴

¹Assistant Professor & Head of the Department, Chaitanya Engineering College, kommadi, Visakhapatnam.

^{2,3}U.G. Students, Department of Civil Engineering, Chaitanya Engineering College, kommadi, Visakhapatnam.

⁴U.G. Student, Department of Civil Engineering, Chaitanya Engineering College, kommadi, Visakhapatnam.

Abstract - Coco Peat is the non-fibrous, spongy, light weight, corky material that holds together the coir fiber in coconut husk. Concrete is the widely used first number of structural materials in the world today. Infrastructure developed across the world created demand for different construction materials. Cost of building materials are increasing day by day so there is a need to find alternative materials in place of ingredients of concrete. Concrete made from coco-peat waste as fine aggregate will be studied for durability properties; the percentage replacement will be 0%, 5%, 10%, 15% and 20% with fine aggregate.

Key Words:- Coco-Peat, Durability, Light Weight Aggregate, Slump, Water Absorption.

1. INTRODUCTION

Concrete is a basic construction material. It is used in a wide range across the world. Usage of concrete becomes vast due to the infrastructural development and increased construction activities. As the demand for concrete increased some negative impacts arises like lack of raw materials, continuous extraction of natural river sand leads to its depletion and decreases ground water level, cement manufacturing plants increases CO₂ content by production of large quantity of cement.

To save the natural resources from over extraction of aggregates from rocks and sand from rivers, many alternate materials are tried in the production of concrete. These alternate materials are found from the wastes generated from domestic, industrial and agricultural sectors.

Durability indicates the life period of the material under the given environmental conditions. In general, concrete is durable under normal environmental situations. The durability issues arise due to either unknowingly introducing deleterious materials while adding the constituents or when the concrete is exposed to severe harmful environmental conditions not expected earlier. Therefore, this study aimed to estimate the durability performance of concrete with coco-peat as partial replacement of fine aggregate.

2. MATERIALS & MIX PROPORTIONS USED

Ordinary Portland cement (OPC) 53 grade conforming to Indian Standard IS 12269: 2013 was used as a binder. Fine aggregate conformed to Indian Standard IS 383: 2016, zone III is used. Coco-Peat of maximum size of 4.75 mm is used as partial replacement of fine aggregate. Coarse aggregate of maximum size 20 mm is used. Mix proportion used for concrete mix was 1:1.61:2.21:0.50 with a cement content of 438.96 kg/m³.

3. DURABILITY TESTS

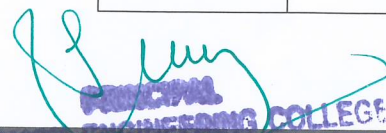
(A) Water Absorption Test

Concrete specimens were placed in an oven and maintained at 105°C±/5°C for 24 hours. After this period, specimens were allowed to cool at room temperature for 24 h and then the weights were measured frequently until the weights became constant. This value was considered as mass of the specimen and noted as W₁. The specimens were then immersed in water for 48 hours and surface dried properly. The weight of oven-dried concrete specimen is taken as W₂.

$$\text{Water Absorption (\%)} = \frac{W_2 - W_1}{W_1} * 100$$

Table -1: Water Absorption of Concrete with varying percentages of Coco-Peat

Coco-Peat (%)	Water Absorption (%)
0	2.70
5	3.01
10	3.20
15	3.34
20	4.70





IJCSPUB PUBLICATION (IJCSPUB.ORG)

INTERNATIONAL JOURNAL OF CURRENT SCIENCE (IJCSPUB)

An International Open Access, Peer-reviewed, Refereed Journal

Experimental Study on Different Types of Steel Fibers on Concrete

¹Kuppili. Venkata Sai Sagar, ²Anusuri. Uma Maheswari¹P.G. Student, ²Assistant Professor & HOD^{1,2} Department of Civil Engineering,^{1,2}Chaitanya Engineering College, kommadi, Visakhapatnam, India

Abstract: In this research, extensive laboratory investigations have been undertaken to study the effect of varying fiber contents on the mechanical properties of Concrete such as compressive, tensile, flexural strengths and durability properties such as water absorption test is conducted. SFRC specimens were casted, cured and tested for 7 and 28 days. Plain concrete specimens were also casted and tested for reference purposes. In this paper, the experimental results of SFRC and plain concrete are discussed for M70 Grade of concrete with straight steel fiber, hooked end steel fiber and crimped steel fiber dosages of 0.5%, 1%, 1.5%, 2.0%, 2.5% & 3.0% by weight of concrete having an aspect ratio of 50. The results show that the strength and durability properties of SFRC with varying dosages of steel fibers enhanced in comparison with the conventional concrete.

Index Terms – Compressive strength, Crimped steel fiber, Flexural strength, Hooked steel fiber, Split Tensile strength, Straight steel fiber.

I. INTRODUCTION

Concrete is the most important and historic discovery of man when it comes to construction. Concrete has allowed humans to build structures which are providing us with the resources to sustain our populated planet. Dams, Bridges and many more structures which have improved after the introduction of concrete have been monumental in making our lives easier. Concrete is able to sustain immense load which could be mounted on the structure.

Concrete strength lies in compression. It is weak to tensile forces. Though, efforts are being put into improving its strength in tension, compressive strength still remains the main forte when it comes to concrete. To increase the tensile strength of concrete a technique of introduction of fibers in concrete is being used. These fibers act as crack arrestors and prevent the propagation of the cracks. These fibers are uniformly distributed and randomly arranged. This concrete is named as fiber reinforced concrete.

Fiber reinforced concrete (FRC) is defined as the composite material of cement concrete or mortar and discontinuous discrete and uniformly dispersed fibrous material. Fiber reinforced concrete is in use since many years in India, but the structural applications are very much limited. However, its application is picking up in the recent days.

Fibers like that of steel, glass, polypropylene, asbestos, carbon etc. are introduced in concrete by partial replacement of cement by weight and the concrete formed is known as Fiber Reinforced Concrete (FRC). FRC is formed when fibers such as steel, glass etc. are added to concrete in addition or by partial replacement to improve the properties such flexural, split tensile as well as compressive strength.

PRINCIPAL
CHAITANYA ENGINEERING COLLEGE
Kommadi, Visakhapatnam-530 048



ASSESSMENT OF WATER QUALITY PARAMETERS

¹Anusuri Uma Maheswari, ²P.Jabez, ³M.Gowtham Nithish, K.Dhanaraj, P.Surendra

¹Assistant Professor & HOD, ^{2,3,4,5} U.G. Students, ¹Department of Civil Engineering,
¹Chaitanya Engineering College, Kommadi, Visakhapatnam, India.

Abstract: The water is a primary natural resource for people for different consumptions such as drinking, irrigation, hydro-electricity, fish fostering and recreation; therefore, it requires at least an acceptable level of water quality. The quality of water usually described according to its physical, chemical and biological characteristics. Due to use of contaminated water, human population suffers from water borne diseases. It is therefore necessary to check the water quality at regular interval of time. Parameters that may be tested include pH, conductivity, turbidity, hardness, dissolved oxygen, alkalinity, total dissolved solids, iron, sulphates and chlorides. Five different samples at five different locations are taken for sampling, Industrial area (Steel Plant), Seashore area (Bheemili), Agricultural area (Anandapuram), Slum area (Allipuram), Hilly area (Kommadi) are selected and the water quality parameters are studied and compared with the Standard water quality parameters.

IndexTerms - Alkalinity, Conductivity, Dissolved Oxygen, Hardness, Total Dissolved Solids, Turbidity

I. INTRODUCTION

Introduction

Water quality refers to the chemical, physical, biological, and radiological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species, or to any human need or purpose. Human activities that involve urbanization, agricultural development, over use of fertilizers, inadequate management of land use and sewage disposal have directly or indirectly affected the quality of water and making it unfit for different purpose. Therefore now a day's fresh water has become a scare commodity due to over exploitation and pollution. Water quality is largely determined by both natural processes including the lithology of the basin, atmospheric inputs and climatic conditions, and by anthropogenic inputs. In this paper, some parameters assessing the quality of water has been presented with past work carried out by scientist and academicians related with quality of water.

According to WHO estimate about 80% of water pollution in India is due to domestic waste. The improper management of water systems may cause serious problems in availability of drinking water. Water resource is most often polluted by industrial effluents. When waste from different industry are discharged without proper treatment in to the water. The physical, chemical and biological characteristics of water are altered in such a way that they are not useful for the purpose for which they are intended.

Need of the Study

The need of study of surface water quality is one of the major issues today due to increasing the load of pollution from industrial, commercial and residential with its effects on human health and aquatic ecosystems.

II. WATER QUALITY PARAMETERS AND ITS SIGNIFICANCE

It is very essential and important to test the water before it is used for drinking, domestic, agricultural or industrial purpose. Water must be tested with different physio-chemical parameters. Selection of parameters for testing of water is solely depends upon for what purpose we going to use that water and what extent we need its quality and purity. Water does content different types of floating, dissolved, suspended and microbiological as well as bacteriological impurities.

Some physical test should be performed for testing of its physical appearance such as pH, turbidity, conductivity, TDS etc, while chemical tests should be perform for its dissolved oxygen, alkalinity, hardness, chlorides, iron, sulphate and fluorides.

Strength and Durability Analysis of Concrete Replacing Cement by Glass Powder

Sriram Neteti, Anusuri Uma Maheswari

Department of Civil Engineering, Chaitanya engineering college, Visakhapatnam.

Submitted: 01-06-2022

Revised: 05-06-2022

Accepted: 08-06-2022

ABSTRACT

Global warming is induced by the release of greenhouse gasses in the atmosphere, including CO₂. Carbon dioxide provides around 65 percent of global warming amongst greenhouse gases. Worldwide cement production generates around 7% of greenhouse gas emissions in the world. As a result, initiatives in concrete production have been undertaken to employ waste materials as partial replacements for coarse or fine aggregates and cement. When crushed to a very fine powder, waste glass exhibits pozzolanic qualities it can be applied as a partial substitute for cement in concrete. The goal of this review is to determine the strength of concrete utilising waste glass powder as a partial substitute for cement in concrete. Cement substitution by glass powder has been tested within ranges of 5% to 40% increments of 5%. It was evaluated for compressive strength and flexural strength at 7 and 28 days of aging, and the data were consistent with those of standard concrete. The findings indicate that replacing 20% of the cement with glass powder resulted in greater strength. An alkalinity analysis was also performed to determine corrosion resistance.

Keywords: Glass powder, M50, Strength and durability.

I. INTRODUCTION

In the present study, an attempt has been made to investigate the strength and durability parameters of concrete made with partial replacement of cement by Glass powder. The effects of curing of concrete on compressive, tensile and flexural strength are investigated when Different percentage replacement of cement by Glass powder in weight. Mix design of M30 grade of concrete is prepared by using ordinary Portland cement (OPC) of 53 grade is adopted. And it has been replaced with Glass powder at different percentages like Different percentage in weight. The

mixed concrete is casted into concrete specimens are cured for 28 days and are tested for compressive, tensile and flexural strength. The obtained results are compared with the conventional concrete mix.

Solid waste management is a very crucial issue for the society worldwide. Glass wastes form a major component of solid waste and being an inert and nonorganic material, it is non-biodegradable and its disposal into landfills create serious environmental problems. Using waste glass in concrete as fine aggregate provide better solution for its disposal problem and also prevent depletion of natural resources like river sand. Since a very large space and lands are used to stockpile waste glass, it is very essential to find ways to reuse it or recycle it. The advantage of almost 100% recyclability of waste glass makes it as one of the material considered for the concept of waste to wealth, world wide. A variety of new products can be produced using waste glass. There are two main ways of use waste glass in concrete.

Glass wool is one of the important form of glass which is used as an heat insulating material on roofs, walls and floors of buildings. Glass wool insulation is recyclable and reusable, so that it can be recycled for another applications after its original use. Based on the citations, it is found that waste glass can be used in concrete in two ways, one is as fine aggregate as a replacement for natural sand and another one is as a Supplementary Cementing Material in concrete. Many research works have been done on concrete with glass waste as partial replacement for fine aggregate and coarse aggregates. Waste management has become a critical challenge in developing countries like India. Unprecedented levels of waste material are produced due to rise in population and the management of solid wastes have arisen as an alarming threat for healthy environment world wide. Since glass wastes are non-biodegradable

EXPERIMENTAL INVESTIGATION ON BEHAVIOR OF STRENGTH ASPECTS OF CONCRETE USING COCO-PEAT

Anusuri.Uma Maheswari*¹, K. Sailaja*², A. Sanjay*³, A. Dharma Teja*⁴,
R. Sai Kumar*⁵, M. Pavan Kalyan*⁶, S. Anand*⁷

*¹Assistant Professor, Department of Civil Engineering, Chaitanya Engineering College,
Kommadi, Andhra Pradesh, India.

*^{2,3,4,5,6,7}U.G. Students, Department of Civil Engineering, Chaitanya Engineering College,
Kommadi, Andhra Pradesh, India.

ABSTRACT

Wastes generated by industrial and agricultural processes have created disposal and management problems which pose serious challenges to efforts towards environmental conservation. In this project, an experimental study is carried out on behavior of M30 concrete while adding coco-peat as partial replacement for fine-aggregate in percentages of 5, 10,15 and 20. Generally waste materials obtained from industries are used as a replacement of materials. Like this, coco-peat is an organic material which is a waste material obtained from coconuts. Like a sponge, coco-peat can hold large quantities of water, it will reduce the rate of curing.

Keywords: Coco-Peat, Compressive Strength, Flexural Strength, Organic Material, Split Tensile Strength.

I. INTRODUCTION

Concrete is a basic construction material. It is used in a wide range across the world. Usage of concrete becomes vast due to the infrastructural development and increased construction activities. As the demand for concrete increased some negative impacts arises like lack of raw materials, continuous extraction of natural river sand leads to its depletion and decreases ground water level, cement manufacturing plants increases CO₂ content by production of large quantity of cement. These reasons have generated a lot of concern about environment in the construction field and leads to researches, experimental investigations on alternative solution for concrete ingredients.

Coco-Peat is the non-fibrous, spongy, light weight, corky material that holds together the coir fibre in coconut husk. It was in early 90's that the horticultural use of coco peat was discovered and the material demand has been in the rise ever since.

II. LITERATURE REVIEW

[1] R. Ramesh, R. Ram Kumar etal [2019] "An Experimental Study on Behavior of Concrete with Coco-Peat": In this thesis they have studied the behavior of concrete with addition of coco-peat at 10% and 20% as partial replacement of fine aggregate. They had carried out investigations on M25 grade concrete and made a comparative study between conventional concrete and coco-peat concrete for compressive strength and split tensile strength at 7 and 28 days of curing. Finally, they concluded that 10% of coco-peat gives the compressive strength and tensile strength as relatively acceptable for a light weight concrete.

[2] G. Vinoth kanna [2018], "Experimental investigations on bricks with the replacement of coconut fibre": There is a positive effect of river sand and coconut fibre partially on clay brick samples that reach its optimum at 50% clay, 35% river sand and 15% coconut fibre by weight can be incorporated into raw clay minerals of brick chambers, without degrading their mechanical properties.

[3] Dr.S. Chithra [2017], "Study on cement mortars made with coir pith particles": This mortar can be used for flooring, making pavement blocks and street road pavements etc. Reducing the usage of non-renewable resource of sand, so that cost of construction also reduced.

[4] V. Sai Uday, B.A Jitha. [2017] "Concrete Reinforced with Coconut Fibre": As we know concrete is weak in tension and flexure so it is reinforced with steel reinforcing bars. Various types of fibres were used in concrete to make it stronger. Natural fibre such as coconut fibre have more physical and mechanical characteristics. The length of fibre used is 6mm with approximate mean aspect ratio, the fibre is presoaked in water for 24 hours.

Stabilization of Red Clay Soil using Rice Straw

Anusuri Uma Maheswari¹, M. Pavan Kumar², Pooja Kumari³, G.V. Tanuj Varma⁴, G. Haritha⁵, M. Venu Gopal⁶, P. Gayatri⁷, B. Divya⁸

¹Assistant Professor & HOD, Department of Civil Engineering, Chaitanya Engineering College, Kommadi

^{2, 3, 4, 5, 6, 7, 8}Under Graduate Students, Department of Civil Engineering, Chaitanya Engineering College, Kommadi

Abstract: Infrastructure projects such as highways, railways, water reservoirs etc, requires earth materials in very large quantities. The foundation should have sufficient strength to support any land based structure. The soil surrounding the foundation plays a very important role. The strength of soil should be maintained according to the loading conditions. One of the most important aspect for construction purpose is to improve the soil strength i.e; stabilizing soil. Here, in this paper, soil stabilization is done by mixing of soil with the chemical treated rice straws fibers. The main motive of this analysis is to find out the utilization of waste rice straw fiber materials in foundation construction without open burning of waste so we can reduce the pollution which create by the open burning of rice straw in the fields.

Keywords: California Bearing Ratio, maximum dry density, optimum moisture content, rice straw, stabilization

I. INTRODUCTION

Different types of soil present in India and every soil has its own characteristics. Some soils have good physical and mechanical properties and some soils have good fertility characteristics. According to the point of view of a geotechnical engineer, the soil should have good bearing capacity but such type of soil is not present in overall country so the soil reinforcement word has been introduce to solve this problem. Soil reinforcement can be define as the inserting of a strengthen material into the soil to increase the bearing capacity and stability characteristics of soil.

Soil stabilization involves the use of stabilizing agents (binder materials) in weak soils to improve its geotechnical properties such as compressibility, strength, permeability and durability. The components of stabilization technology include soils and or soil minerals and stabilizing agent or binders (cementitious materials). Soil stabilization aims at improving soil strength and increasing resistance to softening by water through bonding the soil particles together, water proofing the particles or combination of the two. Usually, the technology provides an alternative provision structural solution to a practical problem.

Agricultural residue burning is a very big issue in worldwide because it creates lots off negative impact on our environment. It creates air pollution by increasing the amount of carbon in environment due to burning which cause climatic changes and global warming. The rice straw burning is a cause of methane emission. In this study we are analyzing rice straw because Rice straw ash have the good concentration of SiO₂ as 40.07% .and 27.5% content of K₂O.

II. LITERATURE REVIEW

- 1) Nidhi Gautam, Sohiti Agrawal, Mukesh Pandey, Nikhil Nandwani (2020), "Effect of Mixing of Rice Straw to Enhance the Characteristics of Soil": In this paper, soil reinforcement analysis completed with the mixing of soil with the powder produced from burning of rice straws fibers (parali) by an specific method. The main motive of this analysis is to find out the utilization of waste rice straw fiber materials in foundation construction without open burning of waste so we can reduce the pollution which create by the open burning of rice straw in the fields. They finally concluded that use of rice straw ash in soil improved the bearing strength of soil on in foundation construction and in slope stability as well.
- 2) Serin Issac, Neethu Elizabeth John (2018), "Stabilization of Expansive Kuttanad clay using Lime treated Rice straw fibres": In this thesis, a detailed study is undertaken to study the effect of Rice Straw as a reinforcement material in Kuttanad clay used as a pavement material. The study is intended to investigate the strength behaviour of the soil reinforced with randomly included Rice Straw fibres. The samples were reinforced with untreated Rice Straw. The untreated Rice Straw was added to soil in addition with Lime also. The reinforced soil samples were then subjected to Unconfined Compressive Strength, Light Compaction and California Bearing Ratio tests to study the effect of fibre reinforcement on Kuttanad clay. Different percentages of Rice Straw fibres (0.25%, 0.5%, 0.75%, and 1%) are added to the 6% lime stabilized soil. They found that maximum CBR value of 5.095 is obtained for 0.5% Rice Straw at optimum lime content of 6% .

Machine learning-based approaches for tomato pest classification

Gayatri Pattnaik¹, Kodimala Parvathi²

¹School of Electronics Engineering, KIIT Deemed to be University, Bhubaneswar, India.

²Department of Electronics and Communication Engineering, Chaitanya Engineering College, Visakhapatnam, India

Article Info

Article history:

Received Jan 22, 2021

Revised Jan 31, 2022

Accepted Feb 08, 2022

Keywords:

DT
GLCM
HOG
K-NN
LBP
SURF
SVM

ABSTRACT

Insect pests are posing a significant threat to agricultural production. They live in different places like fruits, vegetables, flowers, and grains. It impacts plant growth and causes damage to crop yields. We presented an automatic detection and classification of tomato pests using image processing with machine learning-based approaches. In our work, we considered texture features of pest images extracted by feature extraction algorithms like gray level co-occurrence matrix (GLCM), local binary pattern (LBP), histogram of oriented gradient (HOG), and speeded up robust features (SURF). The three standard classification methods, including support vector machine (SVM), k-nearest neighbour (k-NN), and decision tree (DT) are used for classification operation. The three classifiers have undergone a comprehensive analysis to present which classifier with which feature yields the best accuracy. The experiment results showed that the SVM classifier's precision using the feature extracted by local binary patterns (LBP) algorithm achieves the highest value of 81.02%. MATLAB software used for feature extraction and waikato environment for knowledge analysis (WEKA) graphical user interface for classification.

This is an open access article under the [CC BY-SA](#) license.



Corresponding Author:

Gayatri Pattnaik
School of Electronics Engineering, KIIT Deemed to be University
Bhubaneswar, Odisha, India, Pin-751024
Email: gayatripattnaik13@gmail.com

1. INTRODUCTION

Insect pests cause crop losses every year which cost around US\$36 billion. Therefore, immediate decisions are required to prevent pest proliferation. Traditionally, the pesticide was used to avoid damage to the crop, but excess use of it is hazardous and detrimental to our ecosystem. Agricultural scientists created a scheme called integrated pest management (IPM) to limit the use of chemical pesticides since the 1960s [1]. Although it has effective and accurate ways of pest control, still it is not compatible all the time. It needs thorough observation of pest behaviours. Therefore, automatic detection and classification of pest images based on image processing are proposed in this study to achieve pest identification and control.

In recent years, machine learning (ML) and image processing methods have been explored for automatic pest detection and classification mechanism. Wang *et al.* [2] implemented two ML algorithms artificial neural network (ANN) and support vector machine (SVM) to learn pest features and obtained good results. Fina *et al.* [3] developed a k-mean clustering and correspondence filter-based automated plant pest identification and recognition technique. Furthermore, Xie *et al.* [4] developed an insect recognition system using advanced multiple task sparse representation and multiple kernel learning techniques to classify 24 crop pest types. He *et al.* [5] demonstrated a classification approach based on machine vision and image processing for identifying cotton pests and diseases. It uses picture enhancement and filtering algorithms

MACHINE LEARNING BASED PERFORMANCE ANOMALY AVOIDANCE SCHEME FOR MEDICAL IOT APPLICATIONS

¹ILLAPU SANKARA SRINIVASA RAO, ²V. SIVAKUMAR

*¹Research Scholar, Department Of Computer Science And Engineering, Vel Tech Rangarajan Dr. Sagunthala R&D Institute Of Science & Technology, Avadi, Tamilnadu, India

²Associate Professor, Department Of Computer Science And Engineering, Vel Tech Rangarajan Dr. Sagunthala R&D Institute Of Science & Technology, Avadi, Tamilnadu, India

*Email:1 issr.1977@gmail.com

ABSTRACT

The Restricted access window (RAW) method, which is part of the IEEE 802.11ah standard for the Internet of Things (IoT), reduces the effect of collisions on the network while increasing the overall performance of the network. However, in multi-rate IoT networks based on IEEE 802.11ah, performance anomaly degrades the network performance. The Machine Learning based Performance anomaly avoidance with cluster-based grouping (MLPA-CBG) scheme proposed in this article is intended to address this issue. The proposed scheme makes use of the self-organizing map neural network for the purpose of categorizing devices as per bit rate. Then, each group is assigned a time slot that allows them to access the channels. CBG outperforms the default uniform grouping scheme in terms of throughput, delay and energy consumption.

Keywords: CBG, SOM, IoT, anomaly, Machine Learning.

1. INTRODUCTION

With the fast advancement of telecommunications technology, the Internet of Things (IoT) is becoming more popular in many areas of human existence. IEEE802.11ah has recently been announced as a potential standard for Internet of Things (IoT) applications [1]. This standard makes use of a variety of MCS in order to accommodate a wide range of data rates. The network nodes use rate adaptation methods to determine the most effective MCS depending on the observed channel quality. Because of the restricted access window (RAW) method, which is implemented at the medium access control (MAC) layer, power usage is minimized in case of dense Internet of Things networks. When the RAW mechanism is activated, it controls the MAC layer by specifying limited periods for channel access, which are referred to as RAW slots. When it comes to RAW slots, it enables each group of nodes to compete with one another by utilizing CSMA/CA, to get a channel in a RAW slot.

According to the typical IEEE802.11 multi-rate networks, the channel is primarily used by the nodes with the lowest data rates rather than the

nodes with the highest data rates, resulting in performance anomaly. A performance anomaly is defined as a reduction in the throughput of higher rate nodes to the point where it falls below the throughput of lower rate nodes. Similar to the legacy 802.11, it has been found that the performance of the RAW mechanism in conjunction with the UG scheme has been significantly reduced as a result of a performance issue. One easy solution to this issue is to provide the same amount of channel time to all of the nodes. The authors achieved time-based fairness by taking advantage of the transmission opportunities provided by the nodes. In addition, the authors tuned MAC parameters such as arbitration inter frame spacing (AIFS), contention window (W_0), and packet size in accordance with the data rate provided by nodes [2-7].

The majority of existing solutions to the performance anomaly are based on adjusting the MAC settings, which results in extra MAC overhead being introduced. Due to the fact that grouping is an important component, we suggest a Machine Learning based Performance anomaly avoidance with cluster-based grouping (MLPA-CBG) method to



SpringerLink

Log in

Menu

Search

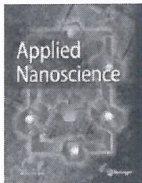
Cart

Home Applied Nanoscience Article

An efficient chaos-LSA integrated game theory algorithm for a QoS-assured delay time control mechanism with a unique parent selection strategy for a 6LOWPAN wireless body area network

Original Article Published: 11 February 2022

Volume 13, pages 3053–3071, (2023) Cite this article



Applied Nanoscience

Aims and scope

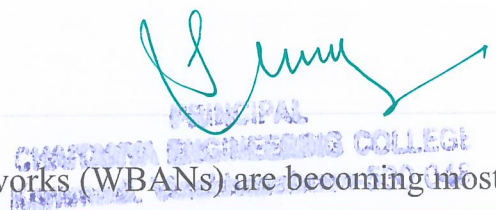
Submit manuscript

Sankara Srinivasa Rao Illapu & **V. Sivakumar**

159 Accesses 2 Citations [Explore all metrics](#) →

Abstract

Through the progress in networking, wireless body area networks (WBANs) are becoming most popular in applications of medical as well as nonmedical fields. Real-time patient monitoring



Smart Materials- Types & Applications

Anusuri Uma Maheswari¹, Anusuri Lavanya², E. Vinay³

^{1,3}Assistant Professor, Civil Department, Chaitanya Engineering College, Kommadi

²Assistant Professor, Electrical Department, Visakha Institute of Engineering and Technology, Narva

Abstract: Smart Materials are also known as advanced materials or intelligent materials or responsive materials. These materials can be defined as advanced materials that can respond smartly to environmental changes. The general feature of all smart materials is the fact that one or more properties might be significantly altered under controlled conditions by external stimuli such as stress, moisture, electric fields, magnetic fields, light, temperature etc.. This study focuses on Smart Materials types and applications in various fields.

Keywords: Actuator, Piezoelectric, Sensors, Shape Memory Alloys, Smart Materials.

I. INTRODUCTION

Smart Materials (SMs) are defined as the materials that change their behaviour in systematic manner as a response to specific stimulus which could be altered. Thousands of years ago human beings used materials for different causes due to which there was an enhancement in their living standards. Even civilizations were divided on the basis of their discovery of materials like the first age was the Stone Age. The most revolutionary age was the Bronze Age because Bronze was durable and harder. From the past two decades, science and technology have made great improvements in synthesizing the new materials. They are divided mainly into 4 categories which are Polymers, Ceramics, Metals and Smart Materials.

Smart Materials are becoming more popular because they have various applications as compared to standard materials. These special materials can change their properties such as materials which can change its shape just by adding some heat or can change its phase instantly when placed near magnet.

The new era of Smart Materials will have a great impact on mankind, for example some of them can change their properties according to the environment and some of them have sensory capabilities some of them can repair automatically and some of them have self-degradation, these extraordinary capabilities of Smart Materials will have an impact on all aspects of civilization.

II. CLASSIFICATION OF SMART MATERIALS

Smart Materials are categorized on the basis of their properties such as Active and Passive. Active Smart Materials possess the capability of modifying their geometric and material properties under the application of electric, thermal or magnetic fields there by acquiring an inherent capacity to transduce energy. Passive Smart Materials lack the inherent capability to transduce energy. The three basic components of smart system are sensor, processor and actuator.

III. TYPES OF SMART MATERIALS

All types of Smart Materials can think on their own and have mental alertness, quick perception, speed activity, effectiveness, spirited liveness and intelligence. The different types of Smart Materials are:

A. Shape Memory Alloys (SMAs)

Shape Memory Alloys are a unique class of metal alloys that can recover apparent permanent strains when they are heated above a certain temperature.

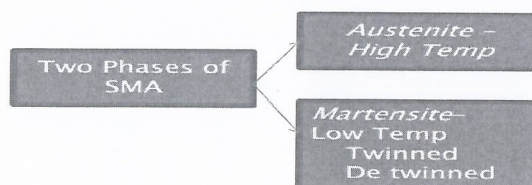


Fig. 1: Two Phases of SMA

A phase transformation which occurs between these two phases upon heating/cooling is the basis for the unique properties of the SMAs.

Identification of Tumour in Lung and Brain using Segmentation Classification Technique

¹Mangalagiri Deepasai, ²Vemulapati Pavani

¹PG Scholar, Dept. of ECE , Chaitanya Engineering College, Vizag, AP, INDIA,

²Assistant Professor, Dept. of ECE , Chaitanya Engineering College, Vizag, AP, INDIA.

Abstract

In several medical vision implementations, segmentation and marking are also the weakest measures. This paper shows a system focused on watershed transformations, which are structured to solve popular problems in a number of applications and are controllable by parameter adaptation. Lung cancer identification, a system for segmenting cancer regions from CT images, a watershed algorithm for image segmentation, and brain tumour detection from MRI images are two of these modules introduced. Neural networks and Support Vector Machines are used to identify data utilising different GLCM features as well as certain mathematical features. We discuss the findings of both implementations in 2D MRI images of brain tumours and CT images of lung cancer to explain the algorithms' concepts and show their generic properties. Finally the rate of accuracy obtained is compared for ANN and SVM classification. The rate of accuracy is 100% for lung images and 96% for brain using SVM classifier. By experimental results the SVM performance is better and suitable in medical image classifications.

Keywords

MRI Images, CT Images, GLCM, Neural Network, SVM

1. Introduction

Lately, picture taking care of methods are comprehensively used in a couple of clinical regions for picture improvement in earlier area and treatment stages, where the time factor is crucial to discover the anomaly issues in target pictures, especially in various threat tumours like cell breakdown in the lungs, chest illness, etc Picture quality and accuracy is the middle factors of this investigation, picture quality assessment similarly as progress are depending upon the improvement stage where low pre-planning techniques is used reliant on Gabor channel inside Gaussian standards. Keeping the division guidelines, an updated territory of the object of interest that is used as a fundamental foundation of feature extraction is gotten. Contingent upon wide features, a commonness connection is made. In this investigation, the essential recognized features for exact pictures assessment are pixels real features. Clinical Image Segmentation is simply the collaboration of modified or loader acknowledgment of cutoff points inside a 2D or 3D picture. A huge difficulty of clinical picture division is the high alterability in clinical pictures. As an issue of first significance, the human existence structures itself shows huge techniques for assortment. Other than a wide scope of modalities (X-bar, CT, MRI, microscopy, PET, SPECT, Endoscopy, OCT, and some more) are used to make clinical pictures. The delayed consequence of the division would then have the option to be

SPECTRAL EFFICIENCY IMPROVEMENT IN UL MASSIVE MIMO USING STBC FRAMEWORK

K.Indira¹, D. Rajitha²

#1student, #2Associate Professor, Department of Digital electronics and communication systems (ECE), Chaitanya Engineering College affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA (JNTUK), Chaitanya Valley, Kommadi, Madhurawada, Visakhapatnam, Andhra Pradesh 530048

Abstract: In wireless communication, Massive MIMO plays a vital role in 4G and 5G technologies. The Massive MIMO systems and MIMO channel models are briefly introduced and the shortcoming with MIMO technologies in achieving LTE - Advanced standard has been conferred. The rapid development in analog and communication technologies makes the cellular communication popular for commercial purposes. The evolution of cellular systems can be described through the different generations. In addition, Massive-MIMO systems are protected against the channel rank loss. Also, it permits existence of cheaper terminals through the possibility of multiplexing gain at base station (BS) without entailing multiple antenna terminals. In order to acquire above benefits, the channel state information at transmitter (CSIT) is crucial to properly succor the multiplexed user. Along with Space time block coding (STBC), the individual user need proper scheduling algorithm reckon on the serving user groups. Even though, the CSIT and scheduling algorithm is not mandatory in SU-MIMO, the Massive-MIMO has been adopted in LTE standard after envisaging its potential advantage. Thus, this work is majorly concentrated on implementation of the Massive MIMO systems with improvements of spectral efficiency compared to the state of art approaches.

Keywords: Massive MIMO, OFDM.

1. Introduction: In wireless communication, Massive MIMO plays a vital role in 4G and 5G technologies. The Massive MIMO systems and MIMO channel models are briefly introduced and the shortcoming with MIMO technologies in achieving LTE - Advanced standard has been conferred. The rapid development in analog and communication technologies makes the cellular communication popular for commercial purposes. The evolution of cellular systems can be described through the different generations. Beginning from analog cellular communications in 1G, the digital systems has evolved from second generation (2G). The 3G systems supports large number of phone calls per cell with 2Mbps data rate whereas, 4G

EXPERIMENTAL STUDY ON USING PLASTIC WASTE IN MANUFACTURING OF PAVER BLOCKS

**Anusuri Uma Maheswari^{*1}, L. Srinuswamy^{*2}, K. Mohan^{*3}, D. Murthy^{*4},
V. Vasudeva Rao^{*5}**

^{*1}Assistant Professor, Department of Civil Engineering, Chaitanya Engineering College,
kommadi, Andhra Pradesh, India.

^{*2,3,4,5} U.G. Students, Department of Civil Engineering, Chaitanya Engineering College, kommadi,
Andhra Pradesh, India.

ABSTRACT

Due to vast population increase, the use of plastic are in day by day is more. Several researches worked on carrying waste plastic application in construction industry. At present nearly lakhs of tons of waste plastic is produced in India every year .So the aim of this project is to replace cement with waste plastic in paver block and to reduce the cost of paver block in compared to that of conventional concrete paver block. In this project we have used waste plastic in different proportions with sand. The paver bocks were prepared and tested and the results were discussed elaborately.

KEYWORDS: Acid Resistance Test, Compressive Strength, Fire Resistance Test, Paver block, Plastic waste.

I. INTRODUCTION

Paver blocks are used in very excess in the construction field because it's gives an aesthetically pleasing look, cost effective and required very less safeguarding. Mostly the paver blocks are manufactured by the use of two main components fine aggregate (sand) and cement, these materials are naturally and easily available but have very high cost. Also cement produce the CO₂ emission in very huge amount by addition of water into it, which is being one of the reason for the global warming. So, we are making an attempt towards the safety of environment and to make the environment pollution free. That's the reason we are adding waste plastic in place of the cement. As we know the waste plastic is the major problem now-a-days for polluting the land and river.

In year 2019 the waste plastic produce worldwide is about 400 million tons, in which only 9% is consumed for recycled, the report is of April,2019 India itself produce 5.6 million tons of waste plastic till April 2019. So, it is very big problem of the disposal of the waste plastic. That's why we are using this waste plastic in the manufacturing of the paver blocks We replaced the cement with waste plastic and performed various test on the paver block manufacture with the waste plastic like, compressive strength test, fire resistance test, hardness test, acid resistance test etc. with different proportions.

II. METHODOLOGY

a) Properties of Materials:

1. Waste Plastic:

Plastic waste used in this project for making paver block was collected from the nearby locality. It includes plastic bottles. Plastics are commonly used substances which play an important role in almost every aspect of our lives. The widespread generation of plastics waste needs proper end-of-life management. The highest amount of plastics is found in containers and packaging's (i.e. bottles, packaging, cups etc.).

2. Fine Aggregate (Sand):

Sand is the most common and very important in all construction work. Natural river sand is used as fine aggregate. The properties of sand were determined by in accordance with the code IS: 2386 (Part-1), (passing from 600 microns retain on 300 microns).


PRINCIPAL



Experimental Study on Stabilization of Red Clay Soil using Rice Husk Ash

¹Anusuri. Uma Maheswari, ²T.Balakrishna, ³K.Bhanu, ⁴M.Avinash

¹Assistant Professor, ^{2,3,4}U.G. Students

¹Department of Civil Engineering,

¹Chaitanya Engineering College, Kommadi, Madhurwada, Andhra Pradesh.

Abstract: Soil is defined as sediments or other accumulation of mineral particles produced by the physical or chemical disintegration of rocks. The main aim is to study the feasibility of stabilizing the soil by using rice husk ash, thus re-using the waste materials and providing an economical and eco-friendly method of soil stabilization. Soil stabilisation is a system to treat the soil to improve the performance of the soil.

Index Terms –California Bearing Ratio(CBR), Stabilisation, Red Clay soil, Rice Husk Ash.

I. INTRODUCTION

For any land-based structure, the foundation is very important and has to be strong to support the entire structure. In order for the foundation to be strong, the soil around it plays a very critical role. So, to work with soils, we need to have proper knowledge about their properties and factors which affect their behavior. The process of soil stabilization helps to achieve the required properties in a soil needed for the construction work. Stabilization of soil is a method to improve the index and Engineering properties of soil. There are certain method of soil stabilization such as mechanical stabilization, chemical stabilization and bio- enzymatic soil stabilization. RHA may be used as chemical stabilizer as it contains high silica content.

II. LITERATURE REVIEW


- [A] T.Subramani, D.Udayakuma (2016) “Experimental study of stabilisation of clay soil using coir fibre”: From this research we concluded that the strength of soil-coir mix is seen to increase as increasing percentage of coir Fibre, CBR and UCS values of soil-coir Fibre mix increases with its increasing percentage. When we reinforce the soil with coir Fibers/coir geo-textiles it is seen to be a cost effective method regarding the ground improvement techniques.
- [B] Aparna Roy (2014), “Soil Stabilization using Rice Husk Ash and Cement”: has presented a study which gives details about soil which is stabilized with different percentages of Rice Husk Ash and a small amount of cement. The results obtained show that the increase in RHA content increases the Optimum Moisture Content but decreases the Maximum Dry Density. Also, the CBR value and Unconfined Compressive Strength of soil are considerably improved with the Rice Husk Ash content.
- [C] Prakash Chava. Dr. M.S. Nagakumar (2014) “Studies on soil stabilisation by using bagasse ash”: It was observed that there was decrease in plasticity index of soil reinforced with bagasse fibre. Bagasse is an eco friendly fibre which is biodegradable also. Values of UCS and CBR increased with its addition. Optimum moisture content also increased. Sugarcane bagasse improved some properties of the clayey soil and also helpful in rural road construction purpose.

III. MATERIALS CHARACTERIZATION

3.1 Clayey Soil

Clay is one of the main construction material in the manufacture of brick. Clay is the finely grained natural rock or soil material that combines one or more clay minerals with possible traces of quartz, metal oxides and organic matter.

Silica is the main constituent & is responsible for strength, resistance to shrinkage and shape of the brick, hardness, and also to a great extent, for its durability or long life. But if we add too much free sand in the brick earth and thereby increase the proportion of total silica in the earth, resulting bricks would be very brittle and porous and may not burn easily. In the red soil lime, kankar and free carbonates are absent and these soils are rich in lime, magnesia, phosphates, nitrogen, humus, and potash. The water holding or water-absorbing capacity of these soils is less


PRINCIPAL
CHAITANYA ENGINEERING COLLEGE



Experimental Study on Stabilization of Black Cotton Soil using Rice Husk Ash

¹Anusuri. Uma Maheswari, ²S.Bhaskara Rao, ³T.Prasanth, ⁴Y.Ganesh

¹Assistant Professor, ^{2,3,4} U.G. Students

¹Department of Civil Engineering,

¹Chaitanya Engineering College, Kommadi, Madhurwada, Andhra Pradesh.

Abstract: Infrastructure projects such as highways, railways, water reservoirs etc, requires earth materials in very large quantity. One of the most important aspect for construction purposes to improve the soil strength is stabilization. Soil stabilization regime improves engineering properties such as volume stability, strength and durability various researches and have shown promising results for application of such expansive soils after stabilization with additives such as lime, fly ash, demolished concrete etc. In this project we used rice husk ash as an additive to the expansive soil. Extensive laboratory/ field trail shave been carried out by Sieve analysis, liquid limit, plastic limit, California bearing ratio, heavy compaction test.

Index Terms – Black Cotton Soil, California Bearing Ratio(CBR), Stabilisation, Rice Husk Ash.

I. INTRODUCTION

Soil is one of the most important engineering materials. The geotechnical properties of a soil such as its grain-size distribution, plasticity, permeability and shear strength etc. can be assessed by proper laboratory testing. Soil alone has very specific properties that may not be appropriate for different types of constructions. construction. This is due to hot climate and poor drainage conditions associated with these soil formations. These soils inhibit the moisture from the surface in monsoon and summer season by means of evaporation. Owing to these reasons, the soil possesses cyclic swell-shrink behavior, low strength, high moisture content, volume change in soil, differential settlement etc. These failures may result in longitudinal and transverse cracking of pavements, surface distress, rutting of surface and deep cutting in foundations. To overcome these circumstances in the soil, it should be treated and stabilized in best way. Thus the geotechnical engineers are required to improve the various unsuitable soils by stabilizing it by chemical or mechanical method. One such unsuitable soil is black cotton soil.

Soil stabilization means the improvement of stability or bearing capacity of the soil by the use of controlled compaction, proportioning and/or the addition of suitable admixture or stabilizers. Broadly, it refers to any chemical or mechanical treatment given to a mass of soil to improve or maintain its engineering properties. Soil stabilization is widely used in road, pavement and foundation construction to improve the Strength, Volume stability and Durability of the soil

II. LITERATURE REVIEW

- [A] Vishal Ghutke, Pranita Bhandari, Vikash Agrawal (2018) “Stabilisation of soil by using RiceHusk”: In this study the stabilization of soil is done by using rice hush at 4%, 8%,12% and determined the Liquid limit, Plastic Limit, MDD.
- [B] Kiran R.G., Kiran L (2015) “Analysis of strength characteristics of black cotton soil using bagasse and additives as a stabilizer”: There was increased strength values and the CBR and UCS values also increased. If the stability of soil is inadequate for supporting the loads of wheels, the soil properties should be improved by soil stabilisation technique. Soil stabilisation is the modification of one or more soil properties by mechanical or any chemical methods to create an improves strength of soil.
- [C] Harshita Bairagi, R.K. Yadav, R Jain (2014) “Effect of jute fibres on engineering characteristics of black cotton soil”: On adding the jute fibres to the soil, a decrease in its swelling behavior is observed. The CBR is seen to increase and unconfined compressive strength increases. As jute is an ecofriendly fibre its application on black soil engineering land is of extreme importance and increases its properties tremendously.

PRINCIPAL
CHAITANYA ENGINEERING COLLEGE
Kommadi, Visakhapatnam-530 044

Manufacturing Process of Plastic Paver Blocks

Anusuri Uma Maheswari¹, P. Ramcharan², S. Bharat Kalyan³

¹ Assistant Professor, Dept of Civil Engineering

^{2,3} Dept of Civil Engineering

^{1,2,3} Chaitanya Engineering College, Kommadi.

Abstract- Plastic waste which is increasing day by day becomes eyesore and in turn pollutes the environment, especially in high mountain villages where no garbage correction system exists. A large amount of plastic is being brought into the tourist trekking regions are discarded or burned which leads to the contamination of environment and air. Hence, these waste plastics are to be effectively utilized. Hence we can use plastic waste in manufacturing of paver blocks by replacing cement.

Keywords- Manufacturing Process, Tests on Paver blocks, Paver Blocks, Plastic Waste.

I. INTRODUCTION

Paver block paving is versatile, aesthetically attractive, functional, and cost effective and requires little or no maintenance if correctly manufactured and lay. Most concrete block paving constructed in India also has performed satisfactorily but two main areas of concern are occasional failure due to excessive surface wear, and variability in the strength of block. Natural resources are depleting worldwide at the same time the generated wastes from the industry and residential area are increasing substantially. The sustainable development for construction involves the use of Nonconventional and innovative materials, and recycling of waste materials in order to compensate the lack of natural resources and to find alternative ways conserving the environment. So in order to save nature resources from depleting we can go for plastic paver blocks which are eco-friendly and cost effective.

II. LITERATURE REVIEW

[A]R.Mahadevil et.al, “An experimental investigation on concrete paver block by using PVC plastic material”:

The aim of their research is to reduce the unit weight, cost of block and also to reduce the environmental pollution. Disposal of plastic in an environment is considered to be a big problem due to its low biodegradability and presence in large quantities. The PVC plastic is used in the form of powder as partial replacement of fine aggregate in percentage of 0, 10 and 30. Using 197x167x61mm bone shaped paver block molds

and M30 grade of concrete mix are used. The compression and water absorption tests are carried out.

[B]Dinesh A, et.al, “Utilization of waste plastic in manufacturing of bricks and plastic paver blocks”:

In this study High-density polyethylene (HDPE) and polyethylene (PE) bags are cleaned and added with sand and aggregate at various percentages to obtain high strength bricks that possess thermal and sound insulation properties to control pollution and to reduce the overall cost of construction, this is one of the best ways to avoid the accumulation of plastic waste which is an on-degradable pollutant. The plastic waste is naturally available in surplus quantity and hence the cost factor comes down.

[C]Manhal A etal, “Strength and Behavior of Concrete contains Waste Plastic”:

This paper presents a method of strengthen concrete by the addition of percentages recycled waste plastic (polyethylene). Samples are investigated at time interval of 7 days using 1%, 3% and 5% from fine aggregate recycled waste plastic (polyethylene). It is found that when waste plastic bottles increased from zero to 5% of the sand in the mix, the compressive strength increase by 4.1% at 7 days age.

III. MANUFACTURING PROCESS OF PLASTIC PAVER BLOCKS

A. Melting Of Plastic

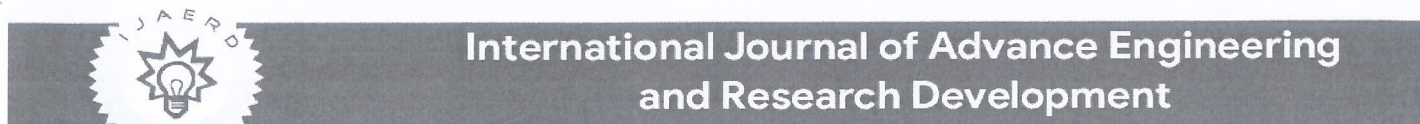
Light a small fire under the metal drum and gently heat it. Add the plastic waste. As it warms up it will reduce in size. Light the plastic at the top using a small flame to help it melt down. Make sure the fire does not get too hot. Keep adding plastic gently at the side of the melted plastic until it melts down to a black liquid. Do not stand directly over the melting barrel try to avoid breathing any gases from the fire and take care as tools can get hot.

Remember, melting plastics will produce fumes which can be harmful if inhaled. Make sure to melt them in a



[Skip to main content](#) [Skip to main navigation menu](#) [Skip to site footer](#)

[Open Menu](#)



- [About The Journal](#)
 - [Vision & Mission](#)
 - [Aim And Scope](#)
 - [Publication Ethics](#)
 - [Open Access](#)
 - [Privacy Policy](#)
 - [Terms & Conditions](#)
 - [Refund Policy](#)
- [Call For Paper](#)
 - [Research Area](#)
 - [Conference Support](#)
- [Author Section](#)
 - [Instructions To Author](#)
 - [Article Processing Charges](#)
 - [Copyright Form](#)
 - [Paper Template](#)
 - [Publication Frequency](#)
 - [Peer-Review Process](#)
 - [Indexing](#)
- [Articles](#)
 - [Current](#)
 - [Archives](#)
- [Reviewer](#)
 - [Editorial Team](#)
 - [Instructions To Reviewer](#)
 - [Reviewer Application Form](#)
- [Submissions](#)
- [Contact Us](#)

[Search](#)

- [Register](#)
- [Login](#)

1. [Home /](#)
2. [Archives /](#)
3. [Vol. 7 No. 12 \(2020\): Volume: 07, Issue: 12 - December, 2020 /](#)
4. [Articles](#)

PID Control of High-Order Non-minimum Phase Systems using Advantages of Model Reduction

Authors

- S.Siva Sankar Department of EEE, Chaitanya Engineering College, Visakhapatnam, A.P
- M.R.Lakshmana Rao Department of EEE, Chaitanya Engineering College, Visakhapatnam, A.P
- Dr.G.Surya Kalyan Department of EEE, Chaitanya Engineering College, Visakhapatnam, A.P

Keywords:

controller design, model reduction, PID controller, singular perturbation approximation, magnitude optimum

Abstract

In this paper, a simple controller design method is presented for design of a higher order non minimum phase (NMP) systems. First the original higher order NMP system is reduced to a lower order NMP model using a model reduction method. Then a Proportional Integral Derivative (PID) controller is designed for the obtained lower order model. The Controller thus obtained is attributed to the original NMP system for its control. The model reduction method employed is based on Singular Perturbation Approximation (SPA) method and the controller design is on Magnitude Optimum Multiple Integration (MOMI) method. The validity of the proposed design method is supported through a numerical example


Downloads

- [PDF](#) [Download PDF](#) [Abstract](#)

Published

2020-12-25

How to Cite


 PRINCIPAL
 CHAITANYA ENGINEERING COLLEGE
 Kanyamedi, Visakhapatnam-530 048

Evaluation of Ultimate Capacity of a Rectangular Solid Slab using Yield Line Analysis

Anusuri Uma Maheswari¹, Shaik Khasim Peera²
¹Assistant Professor, Chaitanya Engineering College

Abstract- In this paper, yield line theory is used to analyze regular slabs for different nine edge conditions. Two approaches are used for the computation of ultimate load-carrying capacity of a reinforced concrete slab concerning yield line theory. One is an energy method which uses the principle of virtual work and the other, an equilibrium method, which study the equilibrium of diverse part of the slab formed by the yield lines. The yield line theory is an upper bound theory and hence which pattern gives lowest load carrying capacity is the governing pattern. Finally equations are formulated by using yield line theory which are simple to apply.

Index terms- Edge conditions, Equilibrium work method, Virtual work method, Failure pattern, Yield analysis

I. INTRODUCTION

Yield line theory was first came into reality by Ingerslev (1923) where for the first time he performed this analysis on an rectangular slab simply supported by only assuming that bending moments act alone at yield lines. This theory was further developed and substantially forged by K W Johansen (1931).

In 1931, K W Johansen gave the conception an implication as lines of relative rotation of rigid slab parts, and in 1943 published this eponymous theory. Yield line analysis was adopted by Danish concrete code and set up into the curriculum at Technical University of Denmark. Wide-ranging research continued following the publications, from 1961-1962, by Wood, Jones and English translation of Johansen's thesis. Yield line theory has also been used quite extensively in the design of concrete plate elements that are required to withstand the forces generated by explosions in both domestic and military applications.

In rectangular slab based on the amount of reinforcement provided in the span directions there

are 2 types of patterns available one is regular and the other is reversal pattern.



Fig.1 Rectangular Slab Yield Patterns

II. METHODS OF ANALYSIS

A. Virtual Work Method

In this method, the work done by external force during small moments of collapse mechanism is equal to the work absorbed by the plastic hinges.

Work done = energy absorbed by the yield lines.

$$\sum (w \times \delta) = \sum (m \times l \times \theta)$$

w is the load acting, δ is the vertical displacement of load

θ is rotation of region about axis of rotation

m is the moment of resistance of the slab per unit run

l is the length of yield line or the projected length on to the axis of rotation.

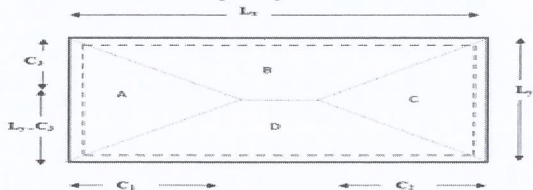
B. Equilibrium/Segmental Method

In this method external work done and internal work done of each individual segments of the slab is determined then the external and internal work done of each segment is equated and thereafter the load carrying capacity of each individual segment of slab is determined.

III. EQUATIONS FORMULATION

Equation calculation by virtual work method:

A. For solid slab regular pattern



Design of Guy Supported Industrial Steel Chimneys



Anusuri Uma Maheswari, Shaik Khasim Peera

Abstract: In last three decades, the constructions of tall stacks were prominent to prevent and control air pollution with the growing interest of industrial development. These structures are generally slender, and tall with cylindrical and circular cross-sections. The constructions of chimneys in practice are with different support conditions such as self-supported, guy wire etc. The most frequent construction materials for chimney or stacks are concrete, steel and masonry. This paper presents the analysis and design of Guy Supported industrial steel chimneys comprises a number of sets of collars (guy wire arrangement) and various height to diameter ratios such as 25, 29 and 33 (the most preferable ratios as per IS 6533 (Part 1): 1989), The analysis were carried out by using STAAD software considering various loads such as dead load, temperature effects, wind, seismic loads etc. and combination of it. As lateral loads are dominant the considered basic wind speeds are 39m/s, 47 m/s, and 55m/s (as per IS 875 (Part 3): 1987) and Seismic load are taken as per IS 1893 (Part 4): 2005 for particular work considering seismic zone-II and with medium soil.

Keywords: Stacks, Guy Supported steel chimney, Seismic zone, Basic wind speed.

I. INTRODUCTION

Chimneys or stacks are very important industrial structures for emission of poisonous and combustible gases to a higher elevation such that the gases do not foul surrounding atmosphere. The construction of tall stacks has been on the increases in the last three decades to prevent and control of air-pollution, because in INDIA deaths causing due to air-pollution are in the fifth place. These structures are slender, tall and generally with cylindrical and circular cross-sections. Chimneys are used to build with different support conditions and different construction materials, such as concrete, steel or masonry. A chimney through which contaminated gases are discharged at a high enough elevation so that after decline due to atmospheric instability, their concentration and that of their entrained solid particulates is within acceptable limits on reaching the ground.

Manuscript received on April 02, 2020.

Revised Manuscript received on April 15, 2020.

Manuscript published on May 30, 2020.

Anusuri Uma Maheswari, Assistant Professor in Chaitanya Engineering College, Kommadi, Visakhapatnam, India.

Shaik Khasim Peera, Master's degree, Structural Engineering, Gayatri Vidya Parishad College of Engineering (Autonomous), Madhurwada, AP.

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

A chimney achieves simultaneous reduction in concentration of a number of pollutants like SO₂, CO, fly ash, etc., and being highly reliable it does not require a standby. While these are its distinct merits, it is well to remember that a chimney is not the complete solution to the problem of pollution control.

II. LITERATURE REVIEW

Anurag jain, Behman arya, Charles goddard and Jon galsworthy (2009) : Discussion is about hurricane loading on chimneys pile foundation system by using non-linear dynamic analysis for assessment of the hurricane and wind loads on pile and mat foundations which support 350ft tall chimneys, results from non-linear dynamic analysis were used. In computer simulation model, Concrete wind shield, pile cap and individual pile were modeled. A 157 kmph and 225 kmph wind speeds are considered for the analysis.

Flaga and liepecki (2010) : Analyze the steel chimneys of circular cross-section due to vortex excitation for lateral response. The maximum displacement at top of chimney to vortex shedding is calculated by using a mathematical model on vortex shedding.

G.Murali, B.Mohan, P.Sitara and P.Jayasree : This paper deals with the study of three chimneys of 55m high above ground level. These chimneys were designed as per IS: 6533–1989 and wind load was calculated as per IS: 875–1987. Three different wind speeds were considered for the design viz., 39m/s, 47m/s & 55m/s respectively. The force exerted by wind on the chimney varies with the wind speed and its associated turbulence.

III. OBJECTIVE

The main objective is about Analysis and Design of Guy Supported Industrial Steel Chimneys for considered sets of collars and various height to diameter ratios such as 25, 29 and 33 this are most preferable ratios as per the IS 6533 (Part 1): 1989 and for various loads such as Dead load, Temperature effects, Wind load (basic wind speeds 39m/s, 47 m/s, and 55m/s) as per IS 875 (Part 3): 1987 and seismic load (seismic zone-II) as per IS 1893 (Part 4): 2005 were studied and finding out the governing load for the design And comparison between the static and dynamic design loads as the no of sets of collars increasing with different height to diameter ratios considered.



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

UTILIZATION OF RICE HUSK IN PRODUCTION OF RED CLAY BRICKS

¹Anusuri.Uma Maheswari, ²D.Rohit Varma ³G.Srivalli, ⁴N.Ravi Raju, ⁵V.Sri Santosh

¹Assistant Professor, ^{2,3,4,5}U.G. Students

¹Department of Civil Engineering

¹Chaitanya Engineering College, Andhra Pradesh, India

Abstract: This study focus on reuse and recycle the available waste generated to find a socio-economic, eco-friendly and cleaner environment and also to study the feasibility of producing bricks using agricultural waste material rice husk in varying percentages. Properties such as compressive strength, water Absorption, hardness, soundness is determined.

Index Terms - compressive strength, hardness, rice husk ash, soundness, water Absorption.

I. INTRODUCTION

Brick is a major component for building work. Reuse of waste generated from industrial & agricultural activities as building materials appear to be visible solution to problem of pollution and waste disposal. In india estimated that nearly 30% of the daily production turns on waste during the manufacturing, transportation and usage. From decades burnt clay bricks have been used in the building construction and it helps reduce the energy consumption of buildings due to its thermal insulation property. As a result of this, there is still an existing demand for clay bricks and good quantity of soil is being exploited for its production. The rice milling industry generates rice husk ash which is also considered as a water product. This study focus on the investigation of properties of clay bricks produced by the partial replacement of the clay with Rice Husk (RH).

II. LITERATURE SURVEY

2.1 Manufacturing of bricks using rice husk ash

Sudarshan S. Shankare et.al (2019) have published a paper "Manufacturing of Bricks Using Rice Husk Ash". In their research rice husk ash was varied by 4, 8, 12, 16 and 20 percentage by weight and Engineering properties like compressive strength, water absorption, soundness, shape and size have been studied according to Indian Standard Specifications and compared to all other proportions. The test outcomes discussed that increasing rice husk in product decline the compressive strength because the combusted rice husk replace with the space in the product which effect the density and compressive strength.

2.2 Use of Rice Husk Ash as Substitute to Make Clay Bricks

Rafid Shams Huq et.al (2018) studied the usage of rice husk ash as supplementary material in production of bricks. The focus of their paper is not identifying the best production process but to explore the effectiveness of one of the possible uses of RHA in the construction industry. Bricks of different percentage of RHA (15%, 25%, 35%) were made and tested for Water Absorption, Crushing Strength, Los Angeles Abrasion Value & Aggregate Impact Value. It was observed that although porosity increases due to RHA, it is still acceptable to use RHA in brick.

2.3 Recycling of bagasse ash and rice husk ash in the production of bricks

Mrs.K.Saranya et.al (2016) examined the usage of sugarcane bagasse ash and rice husk in manufacturing of bricks. In this study SCBA & RHA are mixed in particular proportion (2.5%, 5%, 10%, 15%, 20%) is provided as the replacement of clay in the production of bricks. The experimental results showed that the use of SCBA-RHA-CLAY combination bricks is lighter in weight, durable, non-hazardous, energy efficient, additional strength gains due to pozzolanic properties and reduction in permeability because of pore refinement.

2.4 Effect of Rice Husk and Rice Husk Ash to Properties of Bricks

J. Sutas et.al (2011) Their research has aims to study effect between rice husk and rice husk ash on properties of bricks. Comparative adding between rice husk and rice husk ash were varied by 0 -10% by weight. The results showed that more adding rice husk less compressive strength and density of specimens.

PRINCIPAL
CHAITANYA ENGINEERING COLLEGE
Konnadi, Visakhapatnam-530 119

Experimental Study on Production of Cement Bricks using Waste Materials

Anusuri. Uma Maheswari¹, S. Aparna², V. Kiran Kumar³, R. Venkatesh⁴

¹Assistant Professor, Dept. of Civil, Chaitanya Engineering College, Andhra Pradesh, India
^{2,3,4}B.TECH student, Chaitanya Engineering College, Andhra Pradesh, India

Abstract –Cement is one of the major producers of carbon dioxide, which is the main cause of global warming. During the manufacturing process of cement bricks the formation of clinker can be achieved only by heating the cement at very high temperature. This leads to the release of enormous amounts of carbon in the atmosphere. This CO₂ gas pollutes the environment. On the other hand, waste management became a major challenging problem across the world. In India nearly about 90 million tonnes of bagasse gets produced from sugar milling industry and at the same time rice husk waste is generated in large quantities in rice milling industry. Our experimental study deals with the implementation of Bagasse Ash and Rice Husk as an effective replacement for cement.

Key Words: Bagasse Ash, Cement Brick, Rice Husk, Compressive Strength, Water Absorption

1. INTRODUCTION

Due to limited availability of natural resources and urbanization, there is a shortfall of conventional building construction materials. On the other hand, energy produced for the production of conventional construction materials pollutes air, water and land.

There is a strong demand for environmentally safe reuse and effective disposal method for bagasse ash and rice husk which otherwise creates land degradation and makes soil infertile. The ultimate disposal of bagasse ash and rice husk can be accomplished by using it an engineering construction material.

In the present study the main aim is to reduce the quantity of usage of cement in manufacturing of bricks so various attempts were made by using agricultural wastes rice husk and bagasse ash in varying fractions in the manufacturing of cement bricks.

2. OBJECTIVES

- To convert waste materials into construction materials.
- To encourage the wastes as eco-friendly materials.
- Replacement of cement with the rice husk ash and comparison of strength of concrete thus obtained with conventional concrete.

- Evaluating the water absorption capacity of bricks with varying proportions of usage of bagasse ash and rice husk.

3. MATERIALS USED

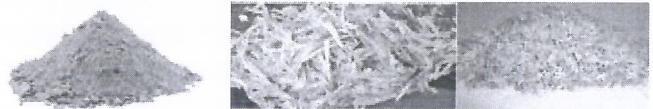


Fig -1: Raw Materials

Cement:

Cement used in this experimental work is Ordinary Portland Cement conforming to IS:4031-1998. The O.P.C. was classified into 3 grades- 33 grade, 43 grade and 53 grade.

Bagasse Ash:

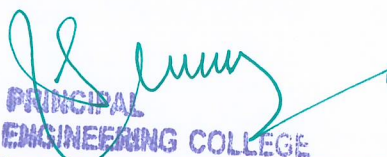
Bagasse Ash is a residue which is obtained from the burning of bagasse in sugar producing factory. The burning of bagasse which a waste of sugarcane produces bagasse ash. Presently in sugar factories bagasse is burnt as a fuel so as to run their boilers. This material contains amorphous silica which is indication of cementing properties.

Rice Husk

Rice Husk is an agricultural by product generated in rice milling industry. Rice Husk is found to be good material which fulfils the physical characteristics and chemical composition of mineral admixtures.

Water:

Water is an important ingredient of brick as it actually used for manufacturing of brick. Since it helps to bind all the raw materials for giving proper mix. Water used for making brick should be free from impurities.


PRINCIPAL
CHAITANYA ENGINEERING COLLEGE
Konnadi, Visakhapatnam-530 048

Experimental Investigation on Usage of Plastic Waste in Manufacturing of Bricks

Anusuri Uma Maheswari¹, N.Ravi Raju², G.Srivalli³

¹Assistant Professor, Dept of Civil Engineering

^{2,3}Dept of Civil Engineering

^{1,2,3}Chaitanya Engineering College, Kommadi

Abstract- In building construction brick is one of the major ingredients in the material used for construction. In the process of brick making, it has to be burn in kiln which introduced to evolve the CO₂ gas in major quantity. This CO₂ gas pollutes the environment. So the solution on this disadvantage of the burnt clay bricks is replacing the bricks with another material i.e. bricks made from waste plastic bottles. Today we need cost effective and environment friendly material which not pollute the enviroenment. Therefore we can use the waste plastic bottles for making an affordable house.

Keywords- eco-friendly bricks, compressive strength test, efflorescence test, plastic waste

I. INTRODUCTION

Plastic is a non-bio-degradable substance which takes thousands of years to decompose that creates land as well as water pollution to the environment. The quantity of plastic waste in Municipal Solid Waste (MSW) is expanding rapidly. It is estimated that the rate of usage is double for every 10 years. The Plastic usage is large in consumption and one of the largest plastic wastes is polyethylene (PE). The utilization of earth based clay material resulted in resource depletion and environmental degradation. As amount of clay required for brick is huge, in this project these waste plastics are effectively utilized in order to reduce the land space required to dump these wastes. This creates the prevention from various harmful diseases. Polyethylene (PE) bags are cleaned and added with fine aggregate at various ratios to obtain high strength bricks that possess thermal and sound insulation properties. This is one of the best ways to avoid the accumulation of plastic waste. It also helps to conserve energy, reduce the overall cost of construction and hence in this project, an attempts made to manufacture the plastic sand bricks by utilizing the waste plastics.

II. MATERIALS

1. Sand

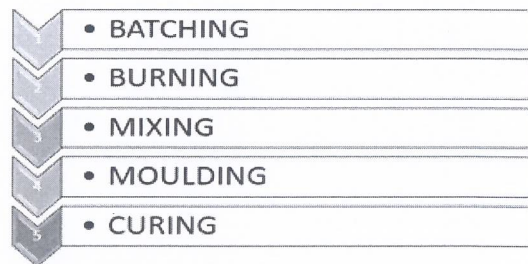
Natural river sand was used as fine aggregate. The properties of sand were determined by conducting tests as per IS: 2386 (Part-1). The results are shown in test data of materials. The results obtained from sieve analysis are furnished.

The results indicate that the sand conforms to zone II of IS: 383-1970.

2. Waste Plastic

Plastics are commonly used substances which play an important role in almost every aspect of our lives. The widespread generation of plastics waste needs proper end-of-life management. The highest amount of plastics is found in containers and packaging's (i.e. bottles, packaging, cups etc.), but they also are found in durables (e.g. tires, building materials, furniture, etc.) and disposable goods (e.g. medical devices). Diversity of plastics applications is related with their specific properties, low density, easy processing, good mechanical properties, good chemical resistance, excellent thermal and electrical insulating properties and low cost (in comparison to other materials).

III. METHODOLOGY



A. Batching of materials:

Mix Ratio	Plastic:Sand Ratio (wt in gms)		
	1:3	1:4	1:5
For 1 brick	1000:3000	800:3200	667:3333

(Handwritten Signature)
 PRINCIPAL
 CHAITANYA ENGINEERING COLLEGE
 Kommadi, Visakhapatnam-530 048

A STUDY OF HIGH PERFORMANCE CONCRETE BY USING INDUSTRIAL WASTE PRODUCT AND AGRICULTURE WASTE MATERIAL ON M80 GRADE CONCRETE

1. Ommi Divya Bharathi ,

2. A. Uma Maheswari

1 PG Scholar, Department of Civil Engineering,
M-Tech (Structural Engineering)

2 Assistant Professor (Structural Engineering) Department of Civil Engineering,
Chaitanya Engineering College.

ABSTRACT Concrete is the most extensively used man-made construction material in the world. Its most important quality is its versatility and the ability to design the concrete of any required properties according to the environment. Human development in today's scenario is impossible without the excessive use of concrete. Cement is the most important component of concrete. Unfortunately production of cement emits a very large amount of greenhouse gases and possesses a very potential threat to the atmosphere. Thus it is inevitable for the sustainable development of human life that the dependency on cement to obtain strength in concrete should be lowered. This is the main reason to obtain a suitable replacement of cement to obtain high strength concrete at a low cost incurred. Also the modern constructions require very high strength in concrete which is only possible by mixing a suitable quantity of admixtures in the concrete. Silica fume, metakaolin and ggbs Slag are abundantly available industrial waste products in India and rice husk ash more available waste material in India. Due to the latest imposed rules and regulations their disposal has become costly. Thus it is necessary to find a suitable useful way to utilize these waste materials. These materials have high siliceous content and pozzolanic properties thus these can be used as a replacement of cement in concrete mix and may also be used as admixture to obtain high strength. In this present case we do the partial replacement of cement with different industrial and agriculture waste material and also curing water and two acids. The proportion of admixture 10-15% silica fume, 10-20% metakoline, 10-20% ggbs slag and 10-20% rice husk ash

Key words : different industrial and agriculture waste material, compressive strength, split tensile strength, flexural strength, acid curing, high performance concrete

1. INTRODUCTION

1.0 General

Concrete is a strong & durable material. The most popular material Reinforced concrete is used throughout the world for construction. After all experiments and researches respect to workability, strength and durability of concrete is increased very much and gives a special performance is called as "High Performance Concrete". It is a range of materials combining of products beyond the conventional mix concrete and construction methods.



PRINCIPAL
CHAITANYA ENGINEERING COLLEGE
Konnadi, Visakhapatnam-530 048

**EXPERIMENTAL INVESTIGATION ON STRENGTH OF
CONCRETE BY PARTIAL REPLACEMENT OF CEMENT
WITH SUGARCANE BAGASSE ASH & FINE AGGREGATE
WITH GLASS POWDER IN CONCRETE**

¹Bammidi Satyavathi,

²A. Uma Maheswari

1PG Scholar, Department of Civil Engineering,
M-Tech (Structural Engineering)

2Assistant Professor(Structural Engineering)Department of Civil
Engineering, Chaitanya Engineering College.

ABSTRACT

Concrete is the most extensively used man-made construction material in the world. Its most important quality is its versatility and the ability to design the concrete of any required properties according to the environment. The researches has shown that every one ton of cement manufacture releases half ton of carbon dioxide, so there is an immediate need to control the usage of cement. on the agriculture materials wastes such as sugar cane bagasse ash is difficult to dispose which in return is environmental hazard. The Bagasse ash imparts high early strength to concrete and also reduce the permeability of concrete. The Silica present in the Bagasse ash reacts with components of cement during hydration and imparts additional properties such as chloride resistance, corrosion resistance. Bagasse ash in concrete not only reduces the environmental pollution but also enhances the properties of concrete and also reduces the cost. Glass powder used in concrete making leads to greener environment. using glass powder in concrete is an interesting possibility for economy on waste disposal sites and conservation of environment. This project examines the possibility of using sugar cane bagasse as partial replacement of cement and glass powder as fine aggregate replacement in concrete. Sugar cane bagasse ash can be taken 5%, 10%, 15%, 20% and 25% and glass powder 5%, 10%, 15%, 20% and 25% in M-60 grade concrete.

Key words: sugar cane bagasse ash, glass powder, compressive strength, split tensile strength and flexural strength




PRINCIPAL
CHAITANYA ENGINEERING COLLEGE
Kottimidi, Visakhapatnam-530 048

Home > Advances in Smart Grid and Renewable Energy > Conference paper


A New Design Method for High-Order Discrete Systems Using Polynomial Differentiation Technique


| Conference paper | First Online: 05 January 2021

| pp 231–236 | [Cite this conference paper](#)

 **Book** Advances in Smart Grid and Renewable Energy
(ETAERE 2020, ETAERE 2020)

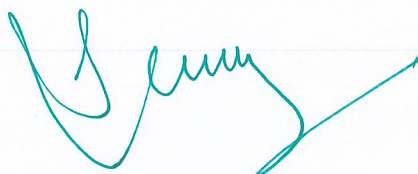
G. V. K. R. Sastry, **G. Surya Kalyan** & R. S. R. Krishnam Naidu 

 **Part of the book series:** Lecture Notes in Electrical Engineering ((LNEE,volume 691))

 **Included in the following conference series:**
International Conference on Emerging Trends and Advances in Electrical Engineering and Renewable Energy

✓ [Show all](#)

 429 Accesses


PRINCIPAL
CHAUDHARI ENGINEERING COLL
Konnadi, Visakhapatnam-530 046

Abstract



Contents lists available at ScienceDirect

Materials Today: Proceedings

journal homepage: www.elsevier.com/locate/matpr

IWO based pattern synthesis of LAA based on tuning of parameters

D. Rajitha*, G. Karunakar

Department of ECE, GITAM Deemed to be University, Visakhapatnam, Andhra Pradesh, India

ARTICLE INFO

Article history:

Received 12 July 2020

Accepted 22 July 2020

Available online xxxxx

Keywords:

IWO

Antennas

Antenna array

Tuning parameters

ABSTRACT

Mobile communications and spatial detection require antennas with high directive radiation pattern. The main aim of this paper is to achieve directive by reducing side lobes for linear antenna array. As the derivative based optimization is prone to level maxima, invasive weed optimization has been with tuning of vital parameters (d, noEl, noff). Being derivative free IWO with parameters tuning has achieved maximum reduction of side lobes from -13.2 db to -19.8 db. The result is encouraging slowly supervision over standard IWO. Another further is possible by Chao theory.

© 2020 Elsevier Ltd. All rights reserved.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Nanotechnology: Ideas, Innovation and Industries.

1. Introduction

Utilization of antenna arrays improves the capacity and specular efficiency of wireless communication systems. Energy Efficiency can also be enhanced [1–5]. A directional main lobe and low side lobe level improve the communication quality and reduce interferences [6–10]. Evolutionary algorithms have been found to be efficient methods of beam pattern synthesis as no restriction is necessary for antenna arrays [11–15]. Suggested a method of GA to synthesize radiation patterns of non-uniform LAA (non-uniform linear antenna arrays) having 20 dB SLL. Rao [16–18] has used PSO for circular antenna arrays. In this research work IWO has been used to solve the beam pattern synthesis problems. The key parameters are properly tuned to achieve better performance. IWO is a numerical statistic optimization algorithm inspired by weed colonization [19]. The whole population consists of a certain number of weeds and each weed is made up of a set of variables for decision. it is assumed that the weeds are robust and invoice posing serious threat to the dissemble plant [20–25].

Principal of IWO: For Optimization minimization everyday with lower value of fitness generates more of number of seeds on the other hand if we do with high value create less number of seeds. Restaurant of freshly created seeds diminishes from maximum to minimum value in the colony framework. Then these are dispensed with zero mean and variance standard deviation to generate new weeds which create new seeds. The total value constant worst fitness is eliminated.

Steps

1. Initialization
2. Reproduction
3. Special distribution
4. Competition explanation

2. Flow chart of IWO

SOP

The current I affect the beam pattern directly. So, an optimal set of excitation current for each element need to be determined to achieve lower SLL. The simulation process of the behaviour of weeds in traditional IWO can be followed by considering the basic features of the process are given below Figs. 1 and 2

Governing equations

$$\begin{aligned} p.d &= d \cos \varnothing \\ E1 &= E2 = E0 \\ \lambda &\rightarrow 2\pi \\ \frac{2\pi}{\lambda} &= \beta \end{aligned} \quad (1)$$

Phase difference $(\frac{2\pi}{\lambda})d \cos \varnothing = \beta d \cos \varnothing$

E.F source 1 = E1 =

Point of 2 lobes by $\frac{\varnothing}{2}$

$$\begin{bmatrix} E1 = E0^{-j\frac{\varnothing}{2}} \\ E2 = E0^{j\frac{\varnothing}{2}} \end{bmatrix} \quad (2)$$

Total E field

* Corresponding author.

E-mail address: drajithagitam@gmail.com (D. Rajitha).<https://doi.org/10.1016/j.matpr.2020.07.577>

2214-7853/© 2020 Elsevier Ltd. All rights reserved.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Nanotechnology: Ideas, Innovation and Industries.

Integration of AODV and OLSR Routing Protocols for Providing Security in MANET's

SEEMA KUMARI VERMA ^{#1}, SATISH KUMAR YANAMADALA ^{#2}

^{#1} M.Tech Scholar, Department of CSE,
Chaitanya Engineering Collège, Kommadi, Visakhapatnam., AP, India.

^{#2} Assistant Professor, Department of CSE,
Chaitanya Engineering Collège, Kommadi, Visakhapatnam., AP, India.

ABSTRACT

Network is a process of connecting multiple systems in order to transfer the information from one location to other location through some physical medium. There are mainly two types of networks: One is Client-Server Architecture (CSA) , in which a client will always have a facility like sending a request to the server and the server will always generates a response for that requested client. Another form is Peer to Peer (P2P) network in which each node can act as both sender and receiver. As we all know that the data or information in the network is mainly divided into packets of equal sizes. However during communication there may be occur some packets lost between nodes due to the reason like node or link failures created by the intruders. To protect these networks, security protocols have been developed to protect routing and application data. However, these protocols only protect routes or communication, not both. In this proposed thesis we try to propose an integrated approach to combine pre-existing routing approaches with security primitive and try to avoid data loss during communication. In this proposed thesis we try to find out the alternate path from the point of attack (POA) and optimize the packet delivery rate.

Key Words:

Packets, Data Communication, Node Failures, Routing Protocols, Point of Attack.

Analytical Study of Funicular and Flat Slabs

V. D. Santosh Kumar

M. Tech. Student

Department of Civil Engineering

Chaitanya Engineering College, Andhra Pradesh, India

A. Uma Maheswari

Assistant Professor

Department of Civil Engineering

Chaitanya Engineering College, Andhra Pradesh, India

Abstract

A funicular slab is a thin doubly curved shell of a shape which is purely in compression in most parts of the shell. In funicular shells, the shape of the shell is such that under a particular loading condition, the shell is subjected to pure compression unaccompanied by bending and shear stresses. The shells are subjected to pure membrane state of stress, under appropriate loading and boundary condition the resulting bending and twisting moment are either zero or small which may be neglected. In this study doubly curved thin shells are analyzed using finite element software SAP 2000. Doubly curved shells which are in square plane having 3m*3m are considered. The behavior of shells under uniformly distributed load is studied and compared with the plane flat slabs of same dimensions and thickness. In this case study deflection curves, membrane stress contour diagram are obtained. It is observed that the deflections, bending moments and shell stresses of funicular shell are reduced when compared to flat slab.

Keywords: Funicular slab, doubly curved thin shells, waffle shells

I. INTRODUCTION

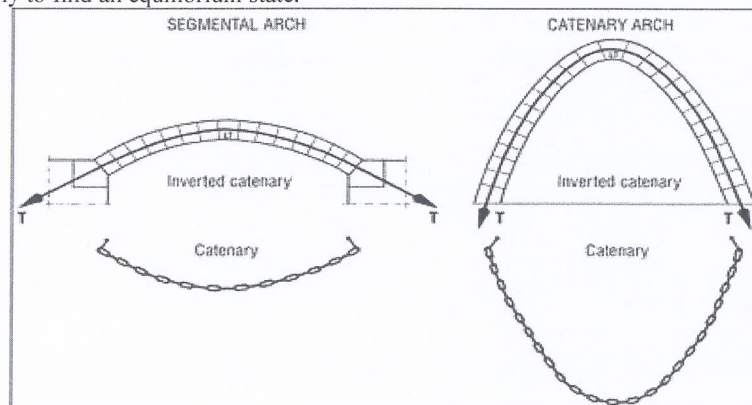
A. General

Precast doubly-curved shells (Funicular shells) have been in use for the past few years as roofing and flooring elements. These shell units are effectively used for replacing the solid RCC slabs. They may be used in conjunction with precast joists or battens or planks or as waffle shells by providing 'in situ ribs in two directions. This type of construction has many advantages over the conventional RCC slabs being lighter in weight and saves reinforcing steel and concrete.

B. Concept of Funicular Shell

A Funicular Shell is a three dimensional catenary on a rectilinear base. The roofing system consists of doubly curved shells made with materials of good compressive strength such as waste stone pieces and brick tiles and supported on reinforced concrete edge beams. A series of these shells in variable geometric configurations supported on a grid of concrete beams, identical to a coffer slab, provides an attractive roof for small to medium spans.

Conceptually, a funicular structure could be said to be a structure which can achieve equilibrium state by adopting a mechanism of a 'right' form (shape/geometry) corresponding to the applied loads. This 'right' form is referred to as the 'funicular' geometry. Medieval vault builders created complex forms carefully balanced in compression. For example, a catenary cable is a 'funicular' geometry for uniformly distributed loads. Under any other loading pattern, this shape is non-funicular, as the cable mechanism needs to move considerably to find an equilibrium state.



In order to achieve a stable structure, the geometry of the structure needs to be funicular (i.e., reciprocal) to the loading condition. The process of tailoring the geometry (form) of the structure to be funicular to the loading condition is called 'form finding'. Funicular structures geometry could be said to be derived from the funicular polygon, a term from graphic statics.

- [About](#)
- [Current Issue](#)
- [Archives](#)
- [Submit a Manuscript](#)
- [Other Journals](#)
- [Contact us](#)

Search

- [Register](#)
- [Login](#)

Home ▶ Archives ▶ Vol. 7 No. 4.22 (2018): Special Issue 22 ▶ Articles

A New Method for the Order Reduction of Multivariable Systems Using Bilinear Transformation and Time Moments Matching Technique

[Article Summary](#)

[Keywords](#)

[Abstract](#)

[References](#)

[Full Article](#)

[How to cite](#)

Authors

Dr. G.V.K.R. Sastry

Dr. G. Surya Kalyan

K. Tejeswara Rao

doi <https://doi.org/10.14419/ijet.v7i4.22.28696>

Contact Information

- Amman, Jordan
- Queen Rania Street, The Union Building, Office 29
- spc@sciencepubco.com
- editor@sciencepubco.com

Follow us on

- [Facebook](#)
- [Twitter](#)
- [LinkedIn](#)
- [Google+](#)

Quick Links

- [Home](#)
- [Contact us](#)
- [Journals](#)
- [Register](#)

Partners

- [Google Scholar](#)
- [CrossRef](#)
- [Open Journal Systems](#)
- [Portico](#)


[Home](#) > [ICCCE 2018](#) > Conference paper


A Novel Method for the Design of High-Order Discontinuous Systems

| Conference paper | First Online: 01 September 2018

| pp 303–309 | [Cite this conference paper](#)

 **Book** [ICCCE 2018](#)
cover (ICCCE 2018)


[G. V. K. R. Sastry](#) , [G. Surya Kalyan](#) & [K. Tejeswar Rao](#)

 **Part of the book series:** [Lecture Notes in Electrical Engineering](#) ((LNEE,volume 500))

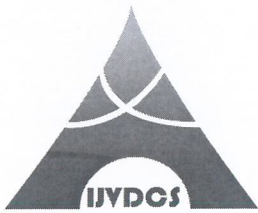
 **Included in the following conference series:**
[International Conference on Communications and Cyber Physical Engineering 2018](#)

 1107 Accesses

Abstract


PRINCIPAL
CHAITANYA ENGINEERING COLLEGE
G.M.MADI, VISAKHAPATNAM-530 048

A new procedure is suggested for the design of high order discontinuous systems using an order reduction technique. The method is computationally very simple and straightforward. The proposed method is based on an improved bilinear Routh approximation method and illustrated using typical numerical examples.



www.ijvdc.org

Reliable Low-Power FIR Architecture Benchmarked On ASIC

BOREDDY MANASA¹, VEMULAPATI PAVANI²

¹Research Scholar, Dept of ECE, Chaitanya Engineering College, Kommadi, Visakhapatnam, Andhra Pradesh, India, Email: reddy.reddypm@gmail.com.

²Assistant Professor, Dept of ECE, Chaitanya Engineering College, Kommadi, Visakhapatnam, Andhra Pradesh, India, Email: vemulapatipavani@gmail.com.

Abstract: Finite Impulse Response(FIR) filters are the most popular type filters in a typical digital filter application on a Digital signal processing(DSP) reads a input samples from an A/D converter, performs the mathematical manipulations dictated by theory for the required filter type and outputs the result via a D/A converter. Digital filters uses finite precision to represent signals and are differ from analog filters as digital filters uses finite precision arithmetic to compute the filter response . In this paper, FIR filter is implemented in Xilinx ISE using VERILOG language. VERILOG coding for the FIR filter is implemented in this paper and waveforms are observed through simulation. For this paper the chosen multipliers are booth and Wallace and the considered adders are Kogge stone and carry skip. In this paper we have to develop an RTL for the structures and verify the functionality of the structures along with performing the synthesis using Xilinx synthesizer. The results are compared in ter ms of area (LUT’S), power for various fir structures.

Keywords: FIR, Wallace, Booth, Koggestone, Carry Skip.

I. INTRODUCTION

Filter is a frequency selective network. A filter allows a particular band of frequencies and attenuates all the remaining frequencies. Analog and digital are the two types of filter. Depending on the impulse response of a filter it is classified into two types one is finite impulse response and the other is infinite impulse response. In the industry of electronics digital filters are used. Compared to analog filters digital filters have attain much signal to noise ratio for this reason we use digital filters than analog filters. The digital filters will perform noiseless mathematical operations at each intermediate step in the transforms. Design engineers use digital filters to achieve better performance level that are difficult to obtain with analog filters.The three operations will do in digital filters are Addition operation or subtraction, Multiplication of a signal by a constant value and Delaying a digital signal by one or more sample periods.A graphical means of describing a digital filter whereby the behavior of the filter is described by in below figure

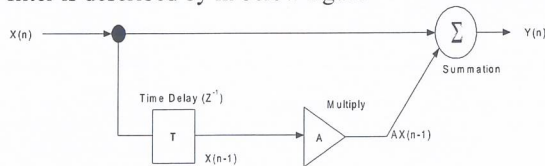


Fig1. Block Diagram of a Simple Digital Filter.

δ(n)Is the unit impulse function given as input to a filter and its response is h (n). if the impulse response of a system is known, it is possible to calculate the system response for any input sequence x (n). at sample index n = 0 the unit

impulse is applied to the system. So. The impulse is non-zero only for values of n greater than or equal to zero i.e., h (n) is zero for n<0. This impulse response is said to be casual otherwise the system would be producing a response before an input has been applied. It is known from the time-invariance property of a Linear Time Invariant System that the response of a system to a delayed unit impulse (n - k) .

y(n) = sum_{k=-inf}^{inf} x(k)h(n-k) (1)

Multipliers are one of the major devices that are used in digital signal processing systems. A series of repeated addition will give the result for multiplication as in past multiplication is considered as addition, subtraction and shifting. Multiplicand is the number which is to be added, multiplier is the number of times that is added and product is the result. A partial product will be generated while doing addition at each step. The information that is in the content was preserved by interrupting the operands as integers and generating twice the length of operands. Multiplication process is carried out in two steps. The first one is to generate the partial products of the given operands and the second one is to add all the partial products. Twofold is the basic multiplication principle. The partial are evaluated in first fold and all those products are added up to get the final result. Shifting operation is done which gates the right bit to "multiplicand". In order to perform multiplication operation for both signed and unsigned numbers we use two's compliment method. As the key factor of any system is multiplier so the performance of a system is determined by the performance of a multiplier. But the limitation with this

Handwritten signature and stamp: CHAITANYA ENGINEERING COLLEGE, Kommadi, Visakhapatnam-530 048

A REVIEW ON MIMO OFDM WIRELESS CHANNEL PREDICTION

By

P. V. V. GEETA *

K. SURESH **

*-** Department of Electronics & Communication Engineering, Chaitanya Engineering College, Visakhapatnam, Andhra Pradesh, India.

Date Received: 15/11/2021

Date Revised: 09/12/2021

Date Accepted: 04/01/2022

ABSTRACT

Multiple Inputs Multiple Output (MIMO) is a wireless technology combined with Orthogonal Frequency Division Multiplexing (OFDM) to ensure that the signals are transmitted orthogonally with each other. It is the continuous growth and improvement of the communication environment. It provides reliability, the highest throughput, data throughput, reliable high data rate, high spectral efficiency, high data rate, and resource allocation. The main purpose of this paper is to provide an overview of the fundamentals of MIMO-OFDM channel techniques.

Keywords: Multiple-Input Multiple-Output (MIMO), Orthogonal Frequency Division Multiplexing (OFDM), SISO, SIMO, MISO.

INTRODUCTION

In traditional wireless communications, the transmitter and receiver each have one antenna. This can lead to increased problems with the multipath effect. When a radio signal encounters an impediment such as a mountain or a building, the signal is scattered, and they must take many routes to reach their destination. The arrival delay of the scattered signal component caused many problems, including unstable reception, fading, etc. This has resulted in a slower data transfer rate and an increased error rate in the digital communications system with remote Internet access. The use of two or more antennas and multiple transmissions of the signal at the source and the destination eliminates the problems posed by multipath propagation of waves and allows taking the impact. MIMO technology has attracted attention due to its potential applications in WLAN, digital television, metropolitan area networks, and mobile communications. MIMO (multiple-input, multiple-output) is an antenna technology in which data is sent in multiple streams from multiple transmitters to multiple receivers.

MIMO improves data speeds as well as range. In various MIMO systems, the achievable capabilities of antenna systems vary. Although the formulas are estimates, they give an idea of how to calculate the channel capacity conditions when using multiple antennas.

Many signal transmission systems are utilized in wireless communication, including FDMA, TDMA, CDMA, and OFDM (Bolcskei, 2006). OFDM (Orthogonal Frequency Division Multiplexing) is a multicarrier modulation technology that is frequently employed in short-range communications. MIMO refers to a system with many inputs and outputs that are used to send and receive multiple signals utilizing multiple antennas at both the transmitter and receiver. There are a variety of setups available, for example, 2 antennas to send the signal and 2 receivers to receive the signal in a 2 x 2 MIMO arrangement.

An ad-hoc network is defined as a collection of wireless mobile nodes that may be configured to create a network and do not require any infrastructure. MIMO makes use of the dimensions of space to increase the capacity, range, and dependability of wireless systems. MIMO is used in conjunction with OFDM to demonstrate multipath resilience, reduce error rates, and improve spectral efficiency and throughput. MIMO OFDM is a broadband wireless access technology (WiFi-802.11n,



This paper has objectives related to SDG



Novel Technique of Synthesizing and Optimizing Linear Antenna Array having Minimal Side Lobes and Null Control Using Invasive Weed Concept

D.Rajitha, G.Karunakar, Rudra Pratap Das

Abstract: In this paper, a special optimization technique called Invasive weed optimization (IWO) has been initiated to synthesize linear variety of antenna arrays. IWO is applied to optimize amplitude excitations for performance improvement such as a reduced level of side lobes as well as control of null. A design example is considered and the amplitude weights are optimized with and without considering a specific beam width. In comparison with the conventional linear array antenna radiation pattern, this approach yields diminished levels of side lobe coupled with nulls positions in specific lines of choice.

Keywords: Antenna Array, Low side lobe level, Null control, Invasive weed optimization

I. INTRODUCTION

For long distance operation and communication devoid of interference, the antennas must have high directivity and minimal levels of side lobe. However, generally arrays having less bandwidth do not produce result in lower levels of side lobe. The above mentioned requirements are conflicting because narrow width of beam does not result in reducing side lobe. The converse is also true. Thus, a compromise has to be obtained by controlling levels of side lobe and synchronously keeping beam width at a suitable value. Novel algorithms such as genetic algorithm (GA)[1] and particle swarm optimization (PSO) [2] are effective in optimizing the gap between elements as well as excitation of the elements in the course of synthesizing the array.

For the objective of achieving a compromise between width of beam and level of side lobes, a highly effective evolutionary algorithm IWO has been selected for discussion in this paper. It is noted that Mehrabain and Lucas introduced IWO [3].

II. FORMULATION

1. Linear Antenna array

Taking an array of antenna placed on line of X-axis, the array factor for the azimuth plane can be expressed in [2].

$$AF(\theta) = \sum_{n=1}^{2N} I_n \cos[kx_n \cos(\theta) + \phi] \quad (1)$$

Revised Manuscript Received on May 8, 2019.

D.Rajitha, Electronics & Communication Department, Chaitanya Engineering College, Visakhapatnam, India.

Dr.G.Karunakar, Electronics & Communication Department, GITAM Deemed to be University, Visakhapatnam, India.

Dr.Rudra Pratap Das, Director R&D, NSRIT, Visakhapatnam, India.

Here k represents the wave number, θ gives the angle of azimuth. I_n , ϕ_n and x_n are the amplitude, phase position of excitation of element n respectively. Assuming uniformity in phase part of excitation ($\phi_n = 0$), by controlling nulls the reduction of side lobe is feasible by variation of I_n .

So the resultant fitness for [2] can be described as

$$Fitness = \sum_i \frac{1}{\Delta\theta_i} \int_{\theta_{li}}^{\theta_{hi}} |AF(\theta)|^2 d\theta + \sum_k |AF(\theta_k)|^2 \quad (2)$$

Here θ_{li} and θ_{hi} are related to spatial regions corresponding to reduction of level of side. Null's direction is given by θ_k , the difference $\Delta\theta_i = \theta_{hi} - \theta_{li}$. Reduction of side lobe level and positioning of nulls are altered by solving the first and second terms of the above equation.

2. Novel Technique of Optimization (Invasive Weed):

The main steps of IWO are a) to Initialize, b) to Reproduce & disperse spatially and c) Competitive exclusion.

a. Initialization

In a solution space of N dimension, random initialization of seeds of finite number is carried out by its irregular positions.

b. Reproduction & Spatial dispersal

This step is similar to growth of seed to flower of the weed. The reproductive capacity of each seed is given by the magnitude of fitness function. Individual fitness value as well as the minimum & maximum values of the specific colony is required to determine the number of seeds reproduced from each seed. The produced seeds follow a random dispersion defined by Gaussian type having zero mean & changing standard deviation. This implies that location search can be carried out by scattering the produced seeds in neighborhood of mother weed. The value of σ reduces non linearity with the progress of generations. Initial value is given by $\sigma_{initial}$ & final value is given by σ_{final} . The relationship can be expressed as

$$\sigma_{gen} = \frac{(gen_{max} - gen)^n}{(gen_{max})^n} (\sigma_{initial} - \sigma_{final}) + \sigma_{final} \quad (3)$$

Here gen_{max} represents the highest figure of generations.



Comparing Radiation Characteristics of Fractal Arrays with Random and Periodic Arrays

N.Kalpana, D.Rajitha, K.Suresh, M.Ramesh Patnaik, T.Durga Prasad

Abstract- In recent years, Antenna design has become one of the important considerations in communication technology. Different antenna designs serve different purposes basing on their performance characteristics, physical design constraints and radiation characteristics. This paper discusses the concept of fractal geometry and applies it to antenna theory. This paper aims to investigate how a random array antenna radiation characteristics can be improved by the choice of fractal geometry of Sierpinski gasket over random and periodic array antenna. Matlab code is used to generate antenna geometry and also its radiation pattern along with its array factor curves.

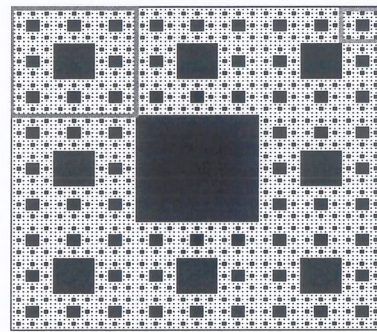
I. INTRODUCTION

Wireless communication has been advancing day by day with ever increasing demand for wireless devices, but works have been still going on to achieve desired radiation characteristics for specific applications. Designing a low profile antenna i.e small in size with wide band or multiband application and less complex in design is one of the most important concern. Many attempts have been made to achieve multiband operation but in most of the cases size reduction may not be possible. This size reduction along with multiband operation can be achieved using fractal geometries as antenna designs. Antenna arrays provide high gain, diversity, beam steering and also Maximize SNR and cancel interference patterns when compared with single antennas. An array of antennas can be of antenna elements placed on a plane in either a periodic or random fashion. These two patterns of arrangement show different radiation properties. Side lobe reduction can be achieved by periodic arrangement of array elements but require more number of array elements. On the other hand, random arrays have higher side lobes, but require less number of array elements and are likely to work in case if one or two elements in array may fail hence they are more robust. This concept of antenna arrays can be extended to Fractal geometry to bridge the gap between random and periodic configurations in antenna arrays. This paper is organized as follows. In section II describes Basics of fractal Geometry followed by Linear arrays in section 3 and then comes section 4 which contains periodic arrays followed by random arrays in

section 5. While the results are depicted in section 6, optimized array comparisons are shown in section 7 and followed by conclusions and references

II. FRACTAL BASICS

Fractal geometries can be defined as geometries a part of which exhibits same characteristics as that of whole structure. Fractal geometries are subset of Euclidean Geometry. Self-Similarity is a properties exhibited fractal geometries that play a crucial role in fractal based antenna designs. Self-similarity can be defined as at any magnification a part of structure always looks exactly similar to that of original structure. For example consider figure1 which is called Sierpinski carpet



In above figure both large and small square boxes are exactly similar to that of whole structure even though they are at different magnification hence it is a self-similar structure. We can obtain a relation for fractal dimension if we know the scaling factor. Suppose if there are "N" such copies of original geometry scaled down by a fraction "F", then the dimension of the fractal is given by D , where

$$D = \frac{\log(N)}{\log(1/F)}$$

Examples of some fractals are Sierpinski gasket, von koch snowflake, Malinowski curve etc which are classified as deterministic. On the other hand there are another classification of fractals which represent naturally occurring objects like tress, mountains etc these fractals called as random fractals

Revised Manuscript Received on April 12, 2019.

N.Kalpana, M.tech, Dept.of ECE Chaitanya Engineering College,VSP (namburi.kalpana@gmail.com)

D.Rajitha, M.tech,(Ph.D) Dept. OF ECE Chaitanya Engineering College,VSP (rajitha.datla@gmail.com)

K.Suresh, M.tech,(Ph.D) Dept. OF ECE Chaitanya Engineering College,VSP (suresh_kutcherlapati@yahoo.co.in)

Dr.M.Ramesh Patnaik, Ph.D, Dept. of Instrumentation Technology AU College of Engineering(A), VSP (suresh_kutcherlapati@yahoo.co.in)

T.Durga Prasad, M.Tech, Dept. of ECE GITAM College of Engineering,VSP (tumula.durgaprasad@gmail.com)

