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 Principal  
 Jagadamba College of Engineering &  
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## A Review on Vertical Axis Wind Solar Hybrid Power System

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### ABSTRACT

Energy is essential for the economic growth and social development of any country. The quality of life is closely related to energy consumption, which has continuously increased over the last few decades in developing countries. The design of a hybrid electric power generation system utilizing both wind and solar energy for remote area is today's need. Wind power is the conversion of wind energy into a useful form of energy. Wind power, as an alternative to fossil fuels, is plentiful, renewable, widely distributed, clean, produces no greenhouse gas emissions during operation and uses little land. The effects on the environment are generally less problematic than those from other power source. The solar energy is available throughout year and it is free and clean sources of energy. The solar PV cells absorb the radiation of sun and converting it into the electrical power. The wind mill is capable to extracted energy in day and night time while the solar PV cell is capable to extracted the power only during day hours. The combination of this hybrid system will be beneficial in future aspects.

**Keyword:** Hybrid Renewable Energy, Solar Energy, Vertical Axis Wind Turbine

### 1. INTRODUCTION

Renewable energy researches, particularly wind and solar have been gaining popularity and recognized as potential sources for clean, inexhaustible and free energies. The concept of on-site renewable energy generation is to extract energy from renewable sources close to the populated area where energy is required. In the modern era, on-site energy extraction from renewable energy sources in urban settings is regarded as the next step in the process of reducing dependencies on the usage of conventional power generation using fossil fuels. A hybrid system consisting of wind and solar renewable energy sources is more beneficial than a system that only depends on one source of energy. Also, the power supply from a hybrid system is more stable and reliable. In addition, optimization of hybrid renewable energy system is crucial for researchers to maximize the energy output from the system with the lowest cost and highest reliability.

  
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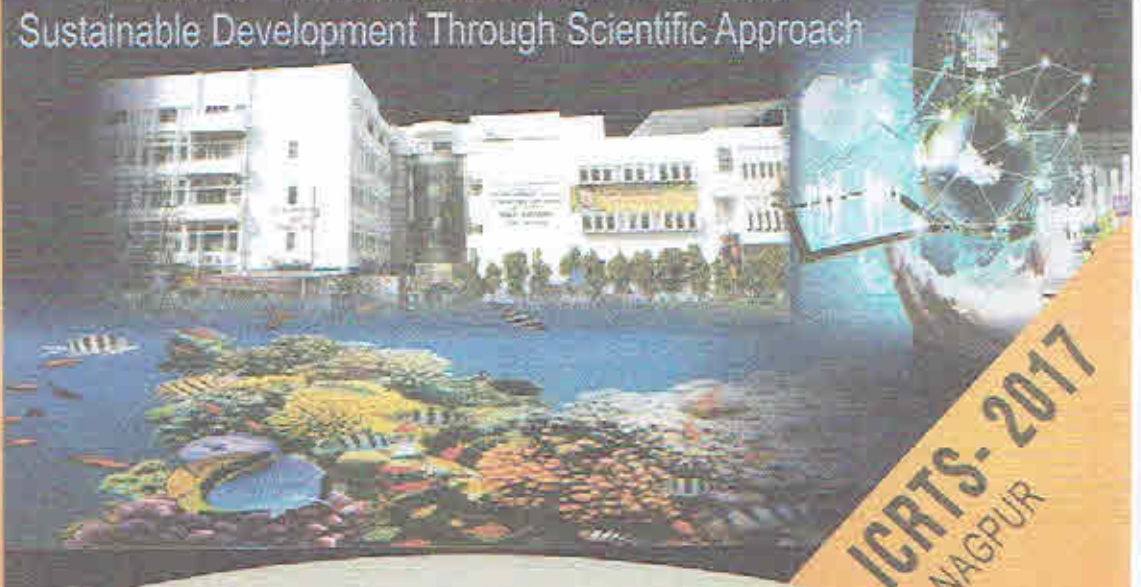
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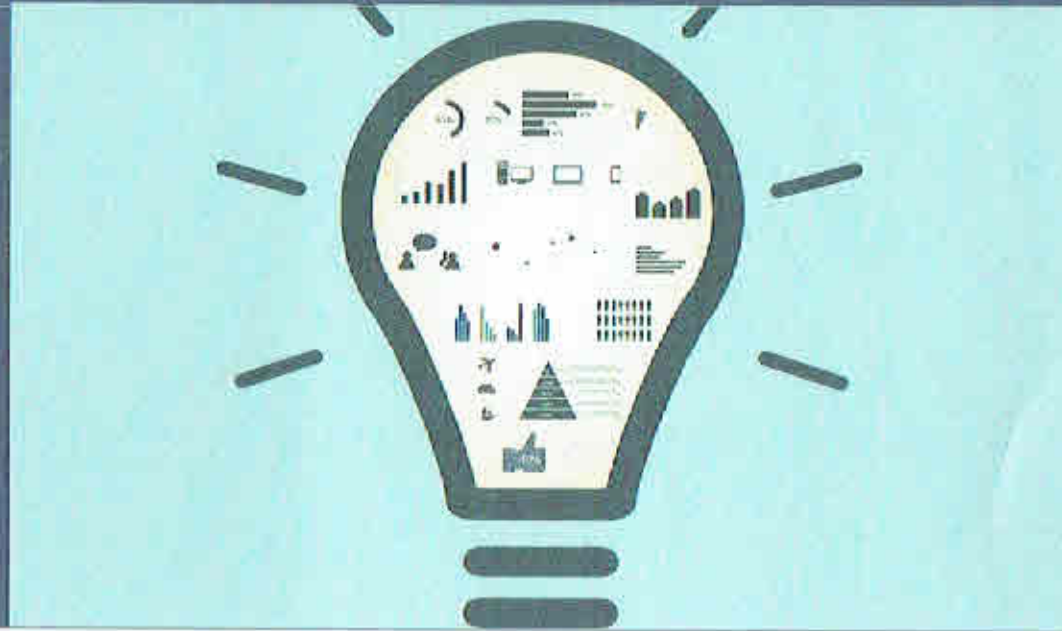
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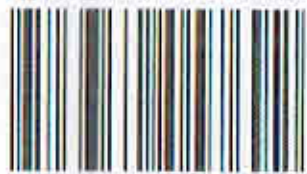


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# Overview of Technical Languages with Questions and Answers

Computer Engineering



978-3-330-05769-2

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The use of the Internet and wireless networks to bring multimedia to the consumer continues to expand. With advancement in network technology, requirement for video streaming application is on the rise. In video streaming applications, the quality of service is usually not insured to reduce delay. The after effect of this approach is that there may be damage of a packet during video transmission which can corrupt block of data or even an entire video frame. Generally, User Datagram Protocol (UDP) is used which does not provide assured quality of service (QoS) in video transmission technology. Therefore, there is a requirement for video error concealment. The proposed method estimates missing block using reconstructed frame and the next frame for each pixel in the lost frame. Fast processing method to satisfy video latency requirements and low power requirements as devices are limited on battery power supply. Hence, it requires a fast, robust and simple algorithm for error concealment. Combination of wavelet transforms and spatio-temporal is implemented.

Image and Video Error Concealment



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# Implementation and Analysis of Video Error Concealment Method

Steps towards High Quality Visual Experience



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Shelotkar, Ingole

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Image concealment algorithm applied for BMP, DIB, EPI, EPS, GIF, JPC, JPEG, PCD, PCX, PDB, PDF, PGM, PICT, PNG, JPG, SVG, TGA, PSD extension of different sizes. The transmission of block-coded visual information over packet networks introduces fidelity problems in terms of data losses, which result in wrong reconstruction of block sequences at the decoder. Concealment techniques aim at masking the visual effect of these errors by exploiting either spatial or temporal available information. Both temporal and spatial approaches present drawbacks, the first is in general inefficient in handling complex or fast objects motion, while the second is computationally expensive and is not able to recover high-frequency contents and small details. In this paper, The technique first replaces the lost block with the best matching pattern in a previously decoded frame using the border information. The first step is achieved by a fast matching algorithm for a high precision is not needed. While the second step recover damaged part of image and boundary of images.




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## Image Error Concealment Technique Using Boundary Matching Algorithm



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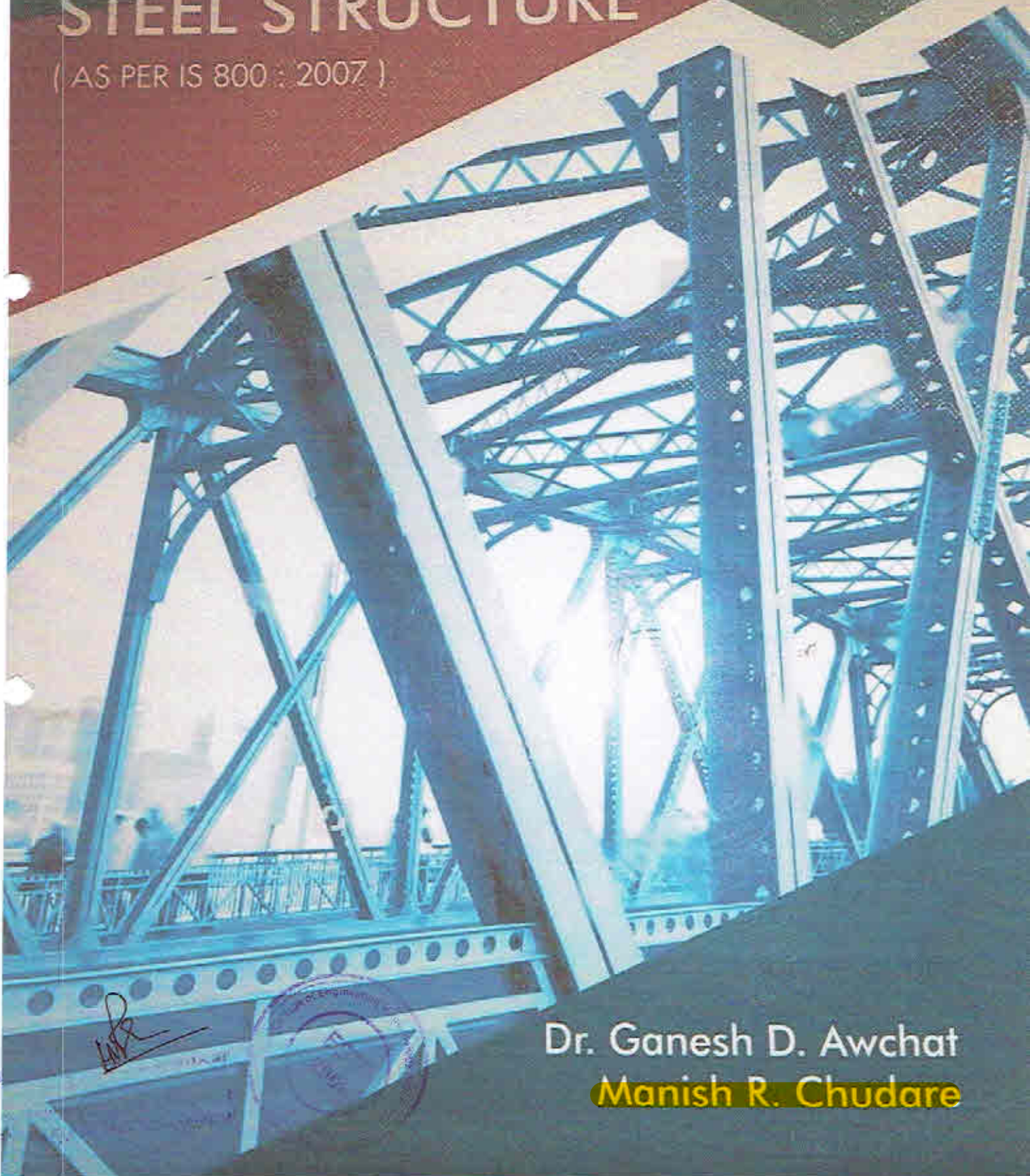


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# Characterization of voltage sag due to faults and induction motor starting

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**Abstract:**  
 The demand of power quality is increasing due to fact that the equipment's in power system are much more sensitive to power quality problems. Electronic instruments are much more sensitive to voltage variation. This rising sensitivity of instruments has drawn attention to more awareness of voltage dips. The Objective of this paper is to characterize the voltage sags due to faults and induction motor starting in power system. The IEEE distribution system is simulated in PSCAD. The output of PSCAD is given to MATLAB. In MATLAB program feature extraction is carried out with the help of Wavelet transform. Various statistical parameters are determined and used as an input to ANN for characterization of voltage sags

Published in: 2017 International Conference on Energy, Communication, Data Analytics and Soft Computing (ICECDS)

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# Realization of 5-bus system using soft computing technique for flexible alternating current transmission system (FACTS) devices

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- IV. Proposed System Description

**Abstract:** Total transfer capability analysis of power system is currently a critical issue in both planning & operating of systems. These issues mainly occur due to increase in area and interchanges among utilities. To reduce the flows in heavily loaded lines, Flexible Alternating Current Transmission System (FACTS) devices is used, this results in increased transfer capability, improve stability of the network, low system losses, and fulfil contractual required by controlling the power flows in the network. To achieve parameters FACTS devices are placed optimally and is done with the help of reduction of total system reactive power loss sensitivity indices analysis method and real power flow performance index sensitivity indices analysis method. Thyristor-Control-Series-Capacitor (TCSC) is used as a FACTS device in the proposed sensitivity analysis method. To decide priority of line for placing TCSC, soft computing technique "Fuzzy logic method" is employed. The performance evaluation of proposed sensitivity analysis methods is done using electrical IEEE-5 bus system. The sensitivity indices are programmed using Matrix Laboratory.

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## Development of Automated system for Measurement and Analysis of Gestational age for monitoring fetal Growth

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**Abstract**— Gestation is defined as a interval of time between thought and start. Estimation of gestational age is necessary in order to foretell the early date of delivery and screen the development of fetus during the three trimester of pregnancy. Comparison of gestational age is centered on size of quite a lot of fetal biometric parameters like gestational sac, bi-parietal diameter, femur size, belly circumference, head circumference for the period of the gestation period. In medical photo processing, ultrasound technique performs a major position for imaging organs for an obstetrician and gynecologist. Monitoring of those parameters is finished with human interplay. These methods are liable for a couple of subjective decisions which increase the inter-observer error. The foremost function of this work is to measure fetal biometric parameter for correct estimation of gestational age. An automated computer headquartered algorithm has been used to apply morphological operation in order to admire the desired parameter contour in the ultrasound picture, refine its shape and catch up on targeted irregularities, then properly measure its size, achieving premiere accuracy and reproducibility of measurements. Automation algorithm makes use of morphological operation, Hough transform and tracing ways. It has been found that, the proposed scheme, is competent to estimate the gestational age of the fetus with a prediction accuracy of +2 days.

**Keywords**—Hough transform analysis, morphological operation, Gestational Sac, Bi-parietal diameter, Head Circumference, Femur length, Filtration.

\*\*\*\*\*

### I. Introduction

The obstetric care has been enhanced with the development within the area of computer technology in the recent prior. Correct estimation of gestational age is desirable for monitoring and accessing the fetal progress. It additionally confirms health of the pregnancy particularly in patient with the historical past of bleeding/pain, principally in high danger pregnancies [1]. These estimations have also been anticipated to furnish useful understanding to take decisions in three trimesters of pregnancy. Fetal growth assessment by ultrasound analysis depends on correct estimation of Yolk Sac (YS), Gestational SAC (GS), Crown Rump size (CRL), Femur length (FL), Head Circumference (HC), abdominal Circumference (AC) and Biparietal Diameter (BPD). In first trimester evaluation of Gestational sac, Yolk sac, Crown rump size performs an major position in predicting the gestational age [1]. In second and 0.33 trimester extraction of Femur size, stomach Circumference, Biparietal diameter, Head circumference of fetus is finished to predict the gestation interval effectively. In implemented scheme extracted parameters incorporate GS, FL, BPD which can be used for the development of automated medical decision help approach (ACDSS) in obstetrics and gynecology.

Comparison of gestational age is established on sufferer historic information and the bodily examination, maternal sensation of fetal action [5]. With the appearance of ultrasound, obstetrics examination has been made less complicated and accordingly noninvasive process has been

used for extraction of fetal biometric parameter. For assessment of quite a lot of parameters, gynecologist first freeze the ultrasound picture of favored biometric parameter, consequently, opting for two elements on the boundaries of parameter by using utilising pleasure sticks or mild pens to measure its length. Accordingly output in phrases of length of parameter is displayed. This process involves more than one subjective decisions increasing the inter-observer error. Considering of tedious and time drinking nature of handbook measurement an automatic system is crucial which objectives to locate the contour segment of favored parameter thoroughly.

Ultrasound pictures are the outcomes of reflection, refraction and deflection of ultrasound beams from quite a lot of forms of tissue with distinct acoustic impendence. Therefore these photos are characterized by using a couple of forms of perturbations: elimination of real structural echoes, displacement and distortion of echoes [8]. In addition, echography includes powerful presence of speckle and additive noise. It additionally include presence of different highly echogenic adjacent to the pinnacle contour and non-uniform bone texture. In addition, the acoustic beam deflections on the bone surface explanations a transformation within the wave propagation direction, for this reason weak echoes are detected through transducer on the assumed attitude of reflection. These entire reasons make the analysis of ultrasound images more complex. Consequently computerized segmentation of those photographs is crucial.

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# MODIFIED MULTI – MEDIA FILTER FOR DOMESTIC WASTEWATER TREATMENT

28

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**Abstract:** Water is one of the most vital elements involved in the creation and development of healthy life. Since water is such a important resource for survival of both plants and animals, it is our responsibility to manage this resource, not only as a social, industrial and commercial good but also for the sustainable benefit of all living matter. Increasing pressure to get more stringent discharge standards or not being allowed to discharge treated effluent has led to implementation of a variety of advanced biological treatment processes in recent years. Current and future fresh water demand could be met by enhancing water use efficiency and demand management. Thus, wastewater is emerging as potential source for demand management after essential treatment. Biological treatment is an good and important part of any wastewater treatment plant that treats wastewater from either municipality or industry having soluble organic impurities or a mix of the two types of wastewater sources. The main advantage of attached growth systems is that they maintain a high concentration of microorganisms resulting in high removal rates at relatively small hydraulic retention times. The basic design and operational characteristics of various systems are presented in terms of packing materials, organic loading rates, treatment temperature, as well as achieved removal rates. Filtration technology is a low cost treatment technology based on physical process to treat wastewater by removing contaminant like COD, BOD, turbidity and suspended solids for a wide range of applications in domestic as well as industrial applications. Research on alternate filtration media, has expanded the options available for improving effluent quality.

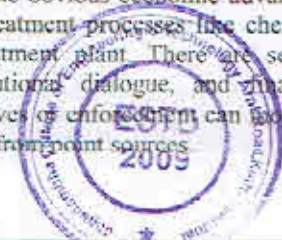
**Keywords—** Filtration, Domestic Wastewater, Packing materials, Multi – Media Filters.

## I. INTRODUCTION

Wastewater is any water that has been adversely affected in quality by anthropogenic influence. It comprises liquid waste discharged by domestic residences, commercial properties, industry, and/or agriculture and can encompass a wide range of potential contaminants and concentrations. In the most common usage, it refers to the municipal wastewater that contains a broad spectrum of contaminants resulting from the mixing of wastewaters from different sources. Wastewater also known as sewage originates from residential commercial and industrial area. Wastewater engineering is that branch of environmental engineering in which the basic principles of science and engineering are applied to solving the issues associated with the treatment and reuse of wastewater. The ultimate goal of wastewater engineering is the protection of public health in a manner commensurate with environmental, economic, social, and political concerns. When untreated wastewater accumulates and is allowed to go septic, the decomposition of the organic matter it contains will lead to nuisance conditions including the production of malodorous gases. In addition, untreated wastewater contains numerous pathogenic microorganisms that dwell in the human intestinal tract.

Wastewater also contains nutrients, which can stimulate the growth of aquatic plants, and may contain toxic compounds or compounds that potentially may be mutagenic or carcinogenic. For these reasons, the immediate and nuisance-free removal of wastewater from its sources of generation, followed by treatment, reuse, or dispersal into the environment is necessary to protect public health and the environment. Wastewater facilitates treatment and reduces risk. Strengthening institutional capacity and establishing links between water delivery and sanitation sectors through inter-institutional coordination leads to more efficient management of wastewater and risk reduction. Filtration is one of the oldest and simplest methods of removing those contaminants. Generally, filtration methods include slow sand and rapid sand filtration. Reliable operation for sand filtration is possible when the raw water has low turbidity and low suspended solids. For this reason, when surface waters are highly turbid, ordinary sand filters could not be used effectively. Therefore, the roughing filters are used as pre-treatment systems prior to sand filtration. Furthermore, roughing filters could reduce organic matters from wastewater. Therefore, roughing filters can be used to polish wastewater before it is discharged to the environment.

Besides that, the purpose of wastewater treatment is to remove pollutants that can harm the aquatic environment if they are discharged into it. Because of the deleterious effects of low dissolved oxygen concentrations on aquatic life, wastewater treatment engineers historically focused on the removal of pollutant that would deplete the DO in receiving waters. Biological treatment is an important and integral part of any wastewater treatment plant that treats wastewater from either municipality or industry having soluble organic impurities or a mix of the two types of wastewater sources. The obvious economic advantage, both in terms of capital investment and operating costs, of biological treatment over other treatment processes like chemical oxidation; thermal oxidation etc. has cemented its place in any integrated wastewater treatment plant. There are several opportunities for improving wastewater irrigation practices via improved policies, institutional dialogue, and financial mechanisms, which would reduce risks in agriculture. Effluent standards combined with incentives of enforcement can motivate improvements in water management by household and industrial sectors discharging wastewater from point sources.

# Video Error Concealment using H.264/AVC

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**Abstract**— The paper presents a novel video error concealment algorithm based on directional decision and intra prediction. Unlike previous approaches that simultaneously recover the pixels inside a missing macro block (MB), we propose to recover them 4×4 block by 4×4 block. Each missing 16×16 MB in an intra frame is divided into 16 blocks each with size 4×4 first, and then recovered block by block using Intra\_4×4 prediction. The previously-recovered blocks can be used in the recovery process afterwards. The principle advantage of this approach is the improved capability of recovering MB with edges and the lower computational complexity. The proposed algorithm has been tested on the H.264/AVC reference software JM7.2. Experimental results demonstrate the advantage of the proposed method.

**Key Words**— Forward Error Concealment, interpolation, Bottom to top & Top to bottom approach, joint source channel coding, robust video transmission, video system model.

## I. INTRODUCTION

Due to the rapid growth of wireless communications, video over wireless networks has gained a lot of attention. Wireless communications has had the most important development. At the beginning, wireless communications was conceived for voice communication. However, nowadays it is able to provide a diversity of services, such as data, image, audio and video transmission thanks to the apparition of third and fourth generation (3G/4G) developments of cellular telephony.

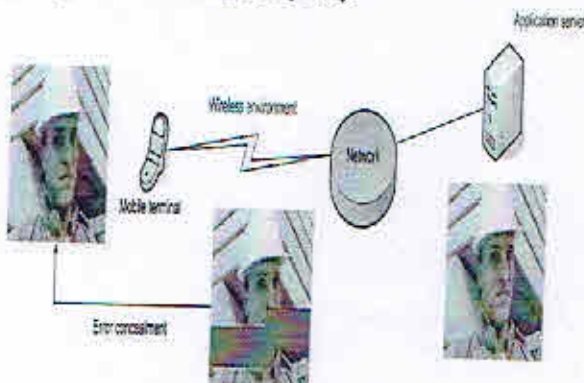


Figure 1.1

Figure 1.1 illustrates a 3G/4G cellular telephony system where a user, with his mobile terminal, demands a video streaming service. The video stream comes from the application server over the network. Then it is transmitted over the wireless Environment to the user. During the transmission, the Image, video signal is error prone. This system, because of the bandwidth limitation, works with low resolution (QCIF 176 x 144) videos so the loss of one

packet means a big loss of information. Since this process is a real time application it is not possible to perform retransmissions. The only way to fix the errors produced by packet losses is by using error concealment methods in the mobile terminal. The focus of this thesis is on spatial and temporal correlations of the Image and video sequence to conceal the errors. The main task of error concealment is to replace missing parts of Image and video content by previously decoded parts of the Image, video sequence in order to eliminate or reduce the visual effects of bit stream error. The error concealment exploits the spatial and temporal correlations between the neighboring image parts (macro blocks) within the same frame or the past and future frames. Techniques using these two kinds of correlation are categorized as spatial domain error concealment and temporal domain error concealment.

The spatial domain error concealment utilizes information from the spatial smoothness nature of the video image, and each missing pixel of the corrupted image part can be interpolated from the intact surrounding pixels. The interpolation algorithm has been improved by the preservation of edge continuity using different edge detection methods. The temporal domain error concealment utilizes from the temporal smoothness between the adjacent frames within the video sequence. The simplest implementation of this method is to replace the missing image part by spatially corresponding part within a previously decoded frame, which has the maximum correlation with the affected frame. The copying algorithm has been improved by considering the dynamic nature of the video sequence. Different motion estimation algorithms have also been integrated to apply motion compensated copying. There are still no standardized means for the performance evaluation of error concealment methods. To evaluate the quality of reconstruction, typically peak signal to noise ratio (PSNR) and structural similarity index metric (SSIM) are used. The focus of this thesis is the performance indicators for evaluating the error concealment methods. To test the performance evaluation methods, H.264 video codec is used. H.264 is the newest codec in video compression, which provides better quality with less bandwidth than the other video coding standards such as H.263 or MPEG-4 part-2. This feature is very interesting for mobile networks due to the restricted bandwidth in these environments.

## II. THE PROPOSED EC ALGORITHM

A block diagram of real-time video communications system is shown in Fig. 1.1. The input video is encoded using appropriate video compression syntax. The transport

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# A Study on Partial Replacement of Cement By Waste Paper Pulp In Concrete

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**Abstract**—Among different waste materials produced in different factories of India, paper industry waste, paper pulp is a noticeable one as it poses problems of health, hazards and disposal. Paper pulp is a growing problem in India as landfill spaces are used up every year causing the decrease of cultivable lands. In some cases, crop lands are used for dumping pulp which reduces fertility and a threat to human health. Disposal of pulp into rivers and canals causes severe water pollution. Some paper mill companies try to get rid of it by using incinerators to burn it causing air pollution. It is reported that waste paper pulp has pozzolanic as well as cementations properties which may be used as partial replacement of cement clinker in concrete production. This paper deals with experimental investigations to evaluate the optimum percentage of waste paper pulp to be used for making concrete.

The M25 grades of concrete were used in this study. Three different replacement level of cement with waste paper pulp i.e. 5, 10, and 15% were used and PPC concrete of 0% cement replacement level was also made for comparison. Compressive test strength of concrete were tested at a curing age of 7 and 28 days. Overall result reveals that use of paper pulp as partial replacement of cement can improve the strength of lower grade concrete upto 20% replacement level. Use of waste paper pulp as partial replacement of cement also markedly reduces the cost of construction which otherwise been dumped making environmental hazard.

**Keywords**—compressive strength, slump value, water absorption capacity of concrete.

## I- INTRODUCTION

At the recent days the development of our country is in the rising graph in various department like in civilization and in industry but when in industry production of materials as well as waste material are made and hence there is need to dispose of this waste

material or reuse in Construction work for the minimize the cost of construction and maintained environment pollution free. Concrete is Composite construction material composed of cement, aggregate (Course aggregate made of gravels or crush of rocks such as limestone or granite plus fine aggregate such as sand ) water, admixture as per mixed design. The concrete made with OPC is relatively strong in compression but weak in tension and tends to be brittle. These two weaknesses have limited its use. Another fundamental weakness of concrete is that cracks start as soon as concrete is placed and before it hardened properly. These cracks are major cause of weakness in concrete particularly in large on-site applications leading to subsequent failure and effect the durability.

India is facing a serious challenge in disposing waste in many landfills throughout the country. The landfill situation is resulting in high disposal costs and potential environmental problems. If current trend continues, with waste production projected to grow by 5% each year, landfills would be at full capacity by 2025.

Paper pulp contains low calcium and maximum calcium chloride and minimum amount of silica. Paper pulps behave like cement because of silica and magnesium properties. This silica and magnesium improve the setting of concrete. Paper pulp consist of cellulose Fibers, calcium carbonate, china clay and residual chemicals which bound up with water. Paper pulp is beneficial to the concrete while helping to economy. The use of paper pulp in concrete can save the paper waste disposal cost and produced green concrete for construction. Paper waste has been used as building material for decades, especially in cementation matrices and since then a lot of research has been done to develop



"A REVIEW ON RC DRONE QUADCOPTER AS SPY CAM"

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**ABSTRACT:** The aim of this paper is to design a light weight quad copter with spy cam. The quad copter will be controlled from a RC (Remote controlled) from a certain distance wirelessly. This small and highly manageable system would acquire data such as video/images from a camera installed in the quad copter and send them to the base station. The project would have an impact on carrying out future rescue missions and would provide visual and audio aid to the people in distress. It will have the ability to help assist, locate and save victims, faster with more efficiency than any other option. It could also be used as a measure for survey or surveillance.

**Keywords:**-Quad copter, Remote Controller, surveillance

## 1. INTRODUCTION

Quad copter is a drone which is the next form of helicopters having more dynamic stability than helicopters. It is a small type of Unmanned Aerial Vehicle (UAV). Unmanned Aerial Vehicles have most often been used in the field of military but they are also used for search and rescue, surveillance, traffic monitoring, weather monitoring, firefighting, research applications in scientific community, fire sensing and some important areas. Quad copters are unmanned aerial vehicles with ability of vertical take offs, landings and hovering at a desired location. Quad copter consists of four rotors which are attached at the end of the frame structure. A pair of rotors in one arm facing each other rotates in clockwise direction while the adjacent pair of rotors rotates in anticlockwise direction. Therefore, the

Resultant torque acting on the air frame structure is zero. Quad copter is a device with an intense mixture of electronics, mechanical and mainly on the principle of aviation. The Quad copter can be customized and sized according to our own convenience. It can be designed as much small as we want by using the small sized components we need to make it.

A Quad copter is a multi-rotor helicopter that is lifted and propelled by four rotors which is operated to fly independently. It is a type of a small representation of Unmanned Aerial Vehicle (UAV). Quad copters are classified as rotorcraft, as opposed to fixed-wing aircraft, because their lift is generated by a set of rotors (vertically oriented propellers). It has four rotating blades that collectively produce thrust to lift the whole thing up. Two rotate clockwise and two anticlockwise so it does not keep spinning. The interesting part is that all four of the rotors must be continuously controlled in speed for the system to stay stable in air. It is not the same as setting each at the same speed since the imbalance in weight will cause it to drift towards one side. Hence it is a control system with the

input being its orientation-tilt, movement, acceleration and output being the speed of rotation of each motor balanced propellers, forcing the air flow down it generates the thrust to lift the Quad copter above the surface. The Quad copter can be sized according to our own convenience. It can be designed as much small as we want by using the small sized components we need to make it.

## 2. LITERATURE REVIEW

Prof. A. V. Javir, Ketan Pawar, Santosh Dhudum, et al. [2], this paper focuses on the aerodynamic effects of a quad copter and addresses all the aspects of quad copter ranging from mechanical design to the components used. It provides backup to the selection of different components with the help of various formulas from research papers. It also gives clear results with respect to weight of components and their corresponding costs.

YiwenLuo, MengJooEr, et al. [3], presented an approach to develop an intelligent control and navigation system of an indoor quad copter. It documents developing a stabilized flying control system with low cost components such as the budget friendly Raspberry Pi computer including traditional PID controller, and electronic speed controller developed to provide the basic platform for the quad copter. PID tuning is utilized to optimize the overall performance. Also, RGB and depth cameras and other sensors are deployed to enable remote semi-autonomous control.

Gordon Ononiwu, Arinze Okoye, et al. [4], this paper presents the design and implementation of an aerial surveillance quad copter for search and rescue applications. The first phase of the paper considered modelling of the quad copter while the second phase involved system implementation.



# A Comparative Study on Nominal Mix With Partially Replaced Cement By Paper Pulp Mix (Trial Mix)

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**Abstract** –Environmental problems are growing due to release of CO<sub>2</sub> in the construction process of cement, it is producing harmful effects on environment. And also shortage of conventional construction materials such as cement, gravels and sand is increasing, because of the higher growth in construction work. Hence alternates are strongly required for these materials. An ordinary Portland cement is caused to five to seven percent of total greenhouse gases emission, so alternative of cement is required for construction of concrete. At the present time researchers searched some substitute for these materials such as fly ash, blast furnace slag, silica fume, rice husk ash, etc apart from this the recent studies research has shown that the paper pulp is also useful for construction of concrete as a fine aggregate. Paper pulp contains low calcium and minimum amount of silica, because of this silica and magnesium paper pulp can be used like cement, paper pulp reduces cost of concrete and also it improves the strength of concrete. This study explains the application of paper pulp as a substitute for binding material in concrete. This paper reviews the performance properties of paper pulp in concrete. Paper pulp can be used as an effective building material. The M25 grades of concrete were used in this study. three different replacement level of cement with waste paper pulp i.e. 5,10, and 15% were used and PPC concrete of 0% cement replacement level was also made for comparison. Compressive test strength of concrete were tested at a curing age of 7 and 28 days. Overall result reveals that use of paper pulp as partial replacement of cement can improve the strength of lower grade concrete upto 20% replacement level. Use of waste paper pulp as partial replacement of cement also markedly reduces the cost of construction which otherwise been dumped making environmental hazard.

**Keywords**–compressive strength, slump value, nominal mix, trial mix.



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## 1- INTRODUCTION

At the recent days the development of our country is in the rising graph in various department like in civilization and in industry but when in industry production of material as well as waste material are made and hence there is need to dispose of this waste material or reuse in construction work for the minimize the cost of construction and maintained environment pollution free.

Concrete is Composite construction material composed of cement, aggregate (Course aggregate made of gravels or crush of rocks such as limestone or granite plus fine aggregate such as sand ) water, admixture as per mixed design. The concrete made with OPC is relatively strong in compression but weak in tension and tends to be brittle. These two weaknesses have limited its use. Another fundamental weaknesses of concrete is that cracks start as soon as concrete is placed and before it hardened properly. These cracks are major cause of weakness in concrete particularly in large on-site applications leading to subsequent failure and effect the durability.

India is facing a serious challenge in disposing waste in many landfills throughout the country. The landfill situation is resulting in high disposal costs and potential environmental problems. If current trend continues, with waste production projected to grow by 5% each year, landfills would be at full capacity by 2025.

Paper pulp contains low calcium and maximum calcium chloride and minimum amount of silica. Paper pulp behaves like cement because of silica and



# Transparent Concrete: An Evolution Towards Better India

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**Abstract** –Transparent concrete is a concrete based building material with light transmissive property due to embedded light optical elements usually optical fibers. There are many varieties of concrete, depending on what people want to achieve. By changing its chemical composition, technological process and adding various other materials, we receive various types of concrete. We use them to create durable supporting structures, a variety of concrete which is resistant to constant moisture or different chemical types. Additionally, some aspects of aesthetics in architecture are made with the help of concrete.

Light is conducted through this fiber from one end to another end. Therefore the fibers have to go through the whole object. Transparent concrete is also known as translucent concrete or light transmitting concrete because of its properties. The main purpose is to use sunlight as a light source to reduce the power consumption. This concrete is used in architectural purpose for good aesthetical view of building.

**Keywords:-** Transparent concrete, optical fibers, light transmissive property.

## I- INTRODUCTION

The Concrete has been used since Roman times for the development of infrastructure and housing but its basic components have remained the same. In 2001, the concept of transparent concrete was first put forward by Hungarian architect at the Technical University of Budapest. Hungarian architect, Aron Losonczy, first introduced the idea of light transmitting concrete in 2001 and then successfully produced the first transparent concrete block in 2003, named LiTraCon.

By research and innovation, newly developed concrete has been created which is more resistant, lighter, white or colored. The first transparent concrete block was successfully produced by mixing large amount of glass fiber into concrete in 2003, named as LiTraCon.



Fig 1: Picture of LiTraCon light transmitting concrete

## II- INGREDIENT

- ▶ **Cement:** It is a binder, a substance that sets and hardens as the cement dries and also reacts with carbon-di-oxide and can bind other materials together.

As the optical fiber is only responsible for transmission of light, there is no special cement required. So, ordinary Portland cement is used for transparent concrete.

- ▶ **Fine aggregate:** it is a chemically inactive material, most of which passes through a 4.75 mm IS sieve. The fine aggregate serve the purpose of filling all the open spaces in between the particles. Thus, it reduces



## Partial Replacement of PPC with Glass powder

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**Abstract**—Disposal problem of waste material is becoming critical day by day. Millions tone of waste glass powder generated every year in world. In this topic, attempt has been made to utilize glass powder, which is waste of glass industry. The research work is determination of the effect the use of Glass powder as a replacement of cement to assess the pozzolanic nature of fine glass powder when mixed in concrete and compare the difference in performance with other pozzolanic materials are mixed in concrete like silica flume and fly ash. The concrete in place of cement to some extent i.e., 10%, 20%, 30% and mechanical properties of M40 (Design Mix) are investigated. Cube specimen of 36 numbers were cast, cured and tested for 3, 7, and 28 days strength. Compression was conducted and the results were compared. The finding revealed an increase in compressive strength with the increase in the replacement of cement by Glass powder. To reduce the demand of cement, glass powder decreases the unit weight as well as the porosity as indicated by decrease in water absorption. It reduce the quantity of cement to be used in concrete. Also glass powder is proved to be economical and is considered as environmental friendly construction material.

**Key Words** – Glass Powder, Replacement to PPC, compressive and tensile strength, cost effective material, M40 (Design Mix).

### I. Introduction

#### 1.1 General Information

Cement- based materials are the most abundant of all man-made materials and are among the most important constructional materials and it is most likely that they will continue to have the same importance in the future; however these construction and engineering materials must meet new and higher demands. When facing issues of productivity, economy, quality and environment, they have to compete with other construction materials such as plastic, steel, wood. Concrete is the 2<sup>nd</sup> largest of the most widely used materials; but there are environmental issues associated with its use which are needed to be taken under consideration and cannot be ignored. Concrete production uses large quantities of natural resources as aggregates and contributes to the release of carbon dioxide during the production of cement.

In sustainable construction importance of waste materials usage in concrete is increasing in manner. The waste glass from small shops is disposing it as a landfill waste. Without changing its chemical property the glass can be used so many times. This waste glass is used for water filtration, grit plastering, sand cover for sport turf and sand replacement in concrete.

Each year about 62 million tons of waste glass is generated in the India, 77% of which is disposed of in landfills, accounting for 6 wt. % of the total municipal solid waste stream. Globally, about 5 wt. % of the 27.02 billion tons/year of municipal solid waste generated is glass. Postconsumer waste glass can be cost-effectively collected in mixed color; there are, however, limited markets for mixed color waste glass. Disposal of waste glass in landfills is costly, considering increasing tipping fees; the non - biodegradable nature of glass further complicates the environmental impact of its disposal in landfills. Stricter environmental regulations and the scarcity of landfill space are other factors encouraging diversion of waste glass from landfills for value-added use in new applications. The reuse of very finely ground waste glass in concrete has economical and technical advantages. If the glass could be ground to a very fine size, it could satisfy the active pozzolanic behavior. Glass waste is recognized to be increasing year by year in a large volume from shops, construction areas and factories. These waste storage disposals are becoming a serious environmental problem.

Due to global warming the need to cut down energy consumption has increased. The effect of global warming has impacted everyone on the planet and is a well-recognized concept. The interest of construction community in using waste or recycled materials in concrete is increasing because of the emphasis placed on sustainable construction. Presently the waste glass in and around the small shops is packed as a waste and disposed as landfill. Waste glass contain high silica (SiO<sub>2</sub>) i.e. 72%. Waste glass when ground to very fine powder (600

# Partial Replacement of Cement In Concrete With Sugarcane Bagasse Ash

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**Abstract** – Concrete is the mixture of cement, fine aggregate, coarse aggregate and water. concrete plays a vital role in the development of infrastructure in this experimental study investigation on SCBA (Sugarcane Bagasse Ash) has carried out which is a byproduct of sugarcane and also can be used as partial replacement material with ordinary Portland cement in concrete. The higher amount of silica present on it reacts with the component of cement hence increase the properties of cement. This experimental study focus on strength characteristics analysis of M20 grade concrete with replacement of cement by SCBA 10%, 20%, 30% and compare with plane cement concrete mixture in terms of compressive strength of cube for 7 days, 14 days and 28 days respectively.

It was found that the use of SCBA up to 25% in a concrete mix as replacement of cement gives more strength than the conventional concrete get reduces.

**Keywords-** sugarcane bagasse ash, concrete, compressive strength

## INTRODUCTION

Concrete is typically an enormous individual material element in built environment. If the concrete can be reduces without decreasing the performance or increasing the cost, significant environmental and economical benefits may be realized. Concrete mainly comprises of Portland cement, sand, aggregate and water. Sugarcane bagasse ash is cementations material that can act as a partial replacement for Portland cement without significantly compromising that compressive strength. SCBA is a byproduct of sugar factories found after burning sugarcane bagasse.

Sugarcane is one of the major crop grown in 110 country and its total production is over 1500 million tons. India it self produce 300 million tons of

sugarcane per year it causes about 30% of sugarcane bagasse and 8 to 10% of bagasse ash. The amount of silica present in a bagasse reacts with component of cement and not only reduce the environmental pollution but also enhance the properties of cement.

The component of SCBA contain  $\text{SiO}_2$  66.89%,  $\text{Al}_2\text{O}_3$  29.18%,  $\text{CaO}$  1.92%,  $\text{MgO}$  0.83% with can be used as an alternative source to replace cement by SCBA partially. Concrete property will maintained with the advance mineral and mixture such as SCBA powder and partial replacement of cement 0%, 10%, 20% and 30%. Compressive strength of SCBA concrete with different dosage of SCBA was studied as a partial replacement of cement.

Environmental sustainability is at steak both in terms of damage caused by the extraction of raw material and  $\text{CO}_2$  emission during cement manufacture. these brought presser on the researcher for the reduction of cement consumption by partial replacement of cement by supplementary material which is naturally occurring, industrial waste or byproduct that are less energy intensive.

From the structural point of view, when cement is replace by SCBA, lower heat of hydration and higher obstructed to sulphate and chloride intrusion. Lately some attention has been given to the use of natural pozzolonas like SCBA as partial replacement of cement. the various methods use to improve the durability of concrete, and to achieve high performance concrete, the use of SCBA is relatively new approach. The present paper focus on the investigating characteristics of M20 grade concrete with partial replacement of cement with SCBA by replacing cement 0%, 10%, 20% and 30%. the cubes and cylinder are tested for compressive strength and split tensile strength respectively.

