VELAGAPUDI RAMAKRISHNA
SIDDHARTHA ENGINEERING COLLEGE
(AUTONOMOUS) (Sponsored by Siddhartha Academy of General & Technical Education)
Approved by AICTE | Affiliated to JNTUK Kakinada | An ISO 9001:2015 Certified Institution
NAAC A+ GRADE
BAND EXCELLENCE

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About the College:

Velagapudi Ramakrishna Siddhartha Engineering College was established in the year 1977, as the first self-financing Engineering College in the composite state of Andhra Pradesh. The college is in Autonomous Status from 2006 onwards granted by UGC, permanently affiliated to JNTUK and approved by AICTE. The institute is accredited by NAAC with A+ grade in 2021. All the UG programs are accredited by NBA under OBE Tier-I format and 5 PG in Engineering programs are also accredited once. The institute was ranked at 178 in NIRF-2021, 156 in NIRF-2020 and 171 in NIRF-2019 by MHRD and also stood at good rankings given in various surveys by national magazines. The institute was ranked in band A' (6-25 Rank) in 'ATAL Ranking of Institutions on Innovation Achievements (ARIA) in 2020 and was ranked ‘Excellent’ band by MHRD, GOI in 2021. The college received AICTE - CII Indpact award from MHRD for best I-I-I in civil engineering and was rated platinum for four consecutive years 2017-2020. The institute is recognized as' SIRO' by DSIR, MST, GOI. This is the only private college granted with "Margadarshan Scheme " project by AICTE in the state of AP. The institute wad rated PLATINUM by AICTE-CII survey for the last four years. The college has 20+ collaborative labs & COE's supported by Siemens, Dassault, IBM, DST, NI. Oracle, Apple, CISCO etc., The college is offering consultancy services in A.P. and earned more than Rs.12 crores during the last 5 years. The institute received R&D projects worth more than Rs.5.0 crores for the last 6 years funded by UGC, AICTE, DST, DRDO etc. The college has a worthy placement record, competent faculty with more than 135 PhDs. The strong presence of Alumni was felt across the Globe as Entrepreneurs, CEOs, Academic leaders etc. Six departments of the institute were recognized as Research centres by JNTUK, Kakinada. The institute has more than 60 MOUs with industry partners and more than 1000 publications by faculty for the last 3 years in National, International Journals and Conferences. Industry relevant curriculum is offered involving MOOCs Industry based courses, Internship Skill development, and Personality Development & Student practice courses. The college has NSS & NCC units in the campus recognized by State and Central Governments. There are quite a good number of visiting and adjunct faculties from foreign universities and industry. The

Laboratories in the Civil Engineering department are also accredited by NABL which is rare in academic institutions.

About the Department :

The Department of Civil engineering of Velagapudi Ramakrishna Siddhartha Engineering College was established in 1977 at the inception of the college. The under graduation program was started with an intake of 60 later increased to 120 in 2007 and further increased to 180 in 2011. The Department started offering Postgraduate courses Structural Engineering from 1999 with an annual intake of 18. The department has state of the art advanced laboratories to cater the needs of students, research and consultancy. The department has total faculty of over Thirty-nine, with fifteen doctorates. The department takes pride in its highly experienced faculty specialized in all major specializations of Civil Engineering.

Department Vision :

To impart teaching, research and develop consultancy that serves the society and to strive continuously for excellence in education.

Department Mission :

To provide quality education for successful career and higher studies in Civil Engineering that emphasizes academic and technical competence in profession and research, effective communication, team work and leadership to meet the challenges of the society.

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1. PAPER PUBLICATIONS OF THE FACULTY

Study on Coastal Area Pollution by Anthropogenic Activities Along The Krishna – Eastern Delta

Dr. KSR Prasad 1 , Pogula Ganesh 2 , Janga Suma 3 , Budi Harika 4 , Sanagala Harish Sai Durga Prasad 5 1 Prof. Dept. of Civil Engineering, Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada – 520007, Andhra Pradesh, India. 2, 3, 4 & 5 UG Students, Velagapudi Ramakrishna Siddhartha Engineering College; Vijayawada – 520007, Andhra Pradesh , India. E-mail id of corresponding author : ksr466ce@vrsiddhartha.ac.in

Abstract: Krishna Delta is located towards 90 km southeast of Vijayawada and 50 km to the south of Machilipatnam. Krishna Eastern delta area receives large quantities of pollution due to Seawater intrusion which directly affects coastal groundwater. Another main cause of pollution is due to excessive use of pesticides, discharging of chemicals and other anthropogenic pollutants from nearby households, aqua cultures . The quality of water is getting deteriorated due to unscientific waste disposal and unethical manmade activities. The waste disposal around the water bodies may damage the groundwater aquifers and physio-chemical properties of water. By testing the Surface waters, underground waters and comparing their properties with Drinking standards of water , we can know the extent of pollution caused in the coastal areas and suggest possible remedial measures.

Binary and Ternary blended self compacting concrete proportioned based on the rheological properties-An experimental investigation

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Abstract: Modern high-performance concrete known as self-compacting concrete (SCC) is distinguished by its exceptional performance in flowing and filling capabilities and high cement content. To counteract the negative effects of using cement, there are several substitute materials available today. Examples include ground granulated blast furnace slag (GGBS) and FLYASH(FA). For this the superplasticizer PC300 is used to increase the workability of the increment in workability. This study aimed at investigating the fresh and hardened properties of SCC produced by GGBS and FA as partial cement replacement. Cement was replaced with combination of FA and GGBSi.e, FA at a constant level of 0%,10%,20% and 30% while GGBS is substituted cement at various levels of 30%, 20%, 10% and 0% as a ternary blending powder.The compressive strength, splitting tensile strength, flexural strength of the concrete mixes was examined for M30 Concrete.

Experimental Investigation on Mechanical Properties of Lightweight Aggregate Concrete

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This present research work mainly focusses on an investigation of the workability and strength properties of lightweight aggregates, particularly Palm oil shell and pumice aggregate, used in the production of concrete with (PA) and (POS), which were substituted for conventional Hard Broken Stone (HBG) coarse aggregate. Through the use of lightweight aggregate (POS and PA) in place of some of the coarse aggregate, the properties of a lightweight concrete M30 have been concentrated in this experimental study. The lab tests that were conducted include the compaction factor test, Schmidt Hammer test (rebound hammer test), and compressive strength. A total of 108 numbers of cube specimen were employed of size 2400 kg/m3. As part of a parametric study, the total number of cube specimens was divided into two groups according to various percentages: palm oil shell and pumice aggregate. In order to cast the cube specimens, dry weight of coarse aggregate was substituted for 0, 10 %, 20 %, 30 %, 40 %, and 50 % of POS and PA lightweight aggregate, respectively. A total of 9 cube specimens were cast and tested for 3, 7, and 28 days after successful curing in order to obtain accurate results. Average values were obtained from the test program and are shown in thecorresponding Tables. Slump, compaction factor, rebound hammer compressive strength, and compressive strength values with different amounts of light aggregate were used to assess how well concrete performed when coarse aggregate was partially replaced with light aggregate. The test findings revealed that when the amount of conventional aggregates substituted by POS and PA increased, the slump test, compaction factor test, and strength of the lightweight aggregate concrete (LWAC) rapidly diminished. With an increase in the amount of aggregates replaced by POS and PA, the LWAC's absorption has gradually increased as water. It is stated at the outset that the POS has shown to perform better than the PA when construction is done using structural lightweight concrete.

A novel optimized intelligent green signal timing system for urban corridor

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In the real world, fixed traffic time signal control is commonly used due to the low implementation cost. However, these signal systems do not achieve the best performance, especially when the unbalanced traffic demand. Hence, a novel buffalo based recurrent fuzzy green timing system (BRFGTS) is proposed to enhance the green timing. Moreover, traffic speed data was initially collected to implement the proposed model. Consequently, after neural layer training, the preprocessing was performed to eliminate the unwanted data. After that, feature extraction is done to take the required features from the preprocessed data.

After extracting the features, the data are moved through the classification process. A recurrent network-based approach trains the data in the classification process. Furthermore, the fitness of buffalo is updated in the classification layer of the recurrent model to reduce the traveling time by improving the shortest route prediction to identify the other path to travel vehicle. The proposed green timing system is implemented in the tool named MATLAB. Subsequently, the results from the proposed model are compared with different techniques. Thus the recorded minimum traveling time by the presented BRFGTS is 20.5 s; compared to other models, it has minimized the traveling time by 40%. Also, the proposed model has minimized the queue length by 38% than the compared models. Hence, the robustness of the novel BRFGTS has been proved.

Prediction of Population Density & Poverty Rate Using Uncertain Mosaics with Satellite

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Abstract: This research work involves combination of Random Forest optimization along with Satellite Imagery (SIML) which is having potential for addressing major global problems by remotely accessing socio-economic and meteorological conditions in data poor areas, although SIML's resource requirements will limits its access and utilization. The Random Forest along with Satellite Imagery (SIML) is enabling better characterizations for population densities and poverty Rates. Further, this Random Forest Applications proves to be a path which is effective to convert such huge amount of uncertain image data into formed assess of conditions of ground.The satellite imagesare collected from GIS (Geographic information system) and then process collected images to RFO for removing mosaic with regression concept. This proposed model generates accuracy 98.78%, recall 97.34%, throughput 97.75% sensitivity 98.45% and efficiency 96.25%. The following outcomes has been competed with present technology and out performers the methodology.

Resistance of Wood Ash Concrete to Sulfuric Acid Attack

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This paper presents the residual compressive strength of wood ash (WA) concrete cube specimens after immersion in diluted sulfuric acid (H2 SO4) solutions. The sulfuric acid resistance of WA concrete is observed using 2% and 5% H2 SO4 solutions. WA is used as mineral admixture and the partial substitution levels of WA are 0% (CW0), 5% (CW5), 10% (CW10), 15% (CW15), and 20% (CW20) by weight of 53 grade Portland cement. WA concrete results are compared with the results of M30 grade concrete (CW0). At CW5 and CW10 replacement levels, a slight enhancement in the strength of WA concrete is noticed. No significant resistance to H2 SO4 is observed with WA concrete when compared with CW0 concrete. Further, the deterioration of CW0, CW5, and CW10 concrete is similar. The substitution of WA with cement reduces the cement content and eventually gives fewer hydrated cementitious products that enable deterioration by H2 SO4 . Furthermore, WA helps in improving the density and filling capacity of the interaction transition zone of concrete which leads to the reduction of pores and capillary action. In brief, the use of WA in concrete benefits by converting environmental concern material into a sustainable resource in producing cementing materials.

A Hybrid Machine Learning Approach for Performing Predictive Analytics on Road Accidents

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19 thousand accidents occurred on the roads of the Indian state of Andhra Pradesh in 2020. Every year, traffic inconsistencies are a major cause of fatalities, injuries, and property damage. Road and traffic accidents are uncertain, unpredictable events, and understanding the elements that influence them is necessary for their study. Age, gender, location, time, climate, and many more factors are among those linked to traffic accidents. A number of variables, most of which are discrete in character, define road accidents. The proposed framework applies statistical modeling and machine learning to the accident dataset containing details of 18,251 road accidents that took place in the Vijayawada region over the period 2013 to 2022, to find the hidden patterns particular to the severity of accidents. These patterns will exhibit common features of accidents that took place at a blackspot. The obtained insights would be helpful in reducing further accidents. The varied nature of accident data analysis is the main challenge. As a result, heterogeneity must be considered while analyzing the data, or any relationship between the data may be obscured. The whole accident data is divided into zones and the proposed methodology is applied to each zone individually. To overcome the heterogeneity of data, Gaussian Mixture Modelling is used to perform soft clustering. Then making use of results, like the means and variances obtained from each gaussian a training dataset is created, accidents are classifed based on severity of consequence using Support Vector Classifier, Decision tree classifier, Random Forest, K-Nearst

Neighbours Classifier, and Naïve Bayes Classifier. Later accuracies of all algorithms are compared to find best suitable model for a zone. The proposed framework makes use of python language libraries like pandas, sklearn, matplotlib, and joblib.

A Review on Emerging Applications of Artificial Intelligence in Civil Engineering

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Civil engineering began with solving problems that were faced by society. Initially, it focused on the implementation of physical and mathematical concepts to solve the problems technically and create engineering solutions. The ancient, medieval, and modern history of civil engineering, implementing new ideas, techniques, and tools to solve real-time problems through AI. These new techniques have created an impact on civil engineering. AI attempts to construct and make operations reasonably simple and precise. Its Trailblazing modeling techniques help crack many complex problems and assist as an analytical tool for diagnosing the results. Machine learning is an application of AI, where a computer uses intelligence to act as a human to accomplish tasks during the process of mathematical models of data that enables a computer to learn and perform on its own experience without any instructions. However, there are no broad appraisals or explanations regarding their applications, so this study focuses on the ethical aspects of their applications, like their predominant role in enhancing the construction industry, geotechnical, watershed management, and transportation fields summarizes it hallow side.

Comprehensive Characterization of Ferrochrome Slag and Ferrochrome Ash as Sustainable Materials in Construction

Batna Anantha Venkata Ram Kumar , 1 Lakshmi Keshav , 2 Panneerselvam Arul Sivanantham , 3 George Gabriel Vimal Arokiaraj , 4 Dhaleelur Rahman Zunaithur Rahman , 5 Puchhakatla Madan Kumar , 1 and Dasappa Somashekar

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Ferrochrome slag (FCS) and ferrochrome ash (FCA) are by-products generated during the production of ferrochrome alloy in the ferrochrome industry. The use of these by-products as construction materials appears

to be an innovative strategy that could provide numerous environmental and socio-economic benefits. However, the residual chromium present in ferrochrome by-products may have some negative effects on the surrounding environment also. In a nutshell, this study provides a thorough and critical examination of ferrochrome slag and ferrochrome ash's suitability for construction, as well as a list of the major shortcomings that must be addressed to accomplish construction sustainability. A detailed summary of the physical, chemical, and mechanical characteristics of ferrochrome slag and ferrochrome ash was presented in the study. Ferrochrome slag from previous studies is said to exhibit better mechanical properties compared to conventional coarse aggregates which contributed to better mechanical properties of concrete. The application of ferrochrome slag as a substitute for natural sand, on the other hand, is considered to have a detrimental impact. As a reason, further research is necessary to determine the impact of replacing conventional fine aggregate with ferrochrome slag on the various mechanical and durability properties of concrete. Ferrochrome ash from previous studies can be used as a partial replacement for cement and unlike FCS, FCA is nonhazardous since no residual chromium traces were present in FCA. Furthermore, the protracted safety and effect on the surrounding environment of ferrochrome slag containing concrete in a variety of exposure conditions have to be fully examined in the near future.

2. CONFERENCES ATTENDED BY FACULTY

Evaluating the feasibility of blending fly ash and quarry dust in high-strength concrete to develop a sustainable concrete: A Study on the Mechanical and Durability Properties

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Due to the increasing demand for the mechanical properties of construction materials, High Strength Concrete (HSC) has been increasingly popular in recent decades. The raw materials utilized in the production of it consume energy and negatively affect the environment. There is a pressing need to protect the environment and conserve natural resources which are being affected by both cement manufacturing and aggregate production. In this research work, the mechanical properties of HSC blended with industrial wastes were assessed to evaluate the feasibility of incorporating industrial wastes into high-strength concrete. An attempt has been made to partially replace cement and fine aggregate in the concrete with fly ash and quarry dust, respectively, at different percentages. The workability, compressive strength, and flexural strength of the concrete, along with durability properties such as water absorption, porosity, density, acid strength loss, and acid mass loss, were investigated and reported. From the results, it can be inferred that utilizing fly ash and quarry dust up to 30% each into the high strength concrete has proved beneficial in terms of mechanical performance. Therefore, it can be concluded that replacing cement and aggregate with industrial wastes such as fly ash and quarry dust up to 30% into the HSC can be a sustainable alternative to the conventional HSC

Effect of bio-cementation process on sandy soil

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Microorganisms are used in microbial geo-technology to amend the stability and bearing capacity of soil. In this research, bio-cementation process is induced in sand by using the microbial solution, calcium hydroxide and urea to enhance the physical features of the soil. Stabilization of buildings built on sandy soils using cementitious materials is an effective technique utilized all over the world to boost bearing capacity. The microbial solution was prepared using different natural elements and the sandy soil is cured in the solution for different intervals. The effects of mechanical properties of the sandy soil were observed. The parameters like California bearing ratio, direct shear strength and water permeability test were tested. Considerable improvement was observed in the various properties of sandy soil.