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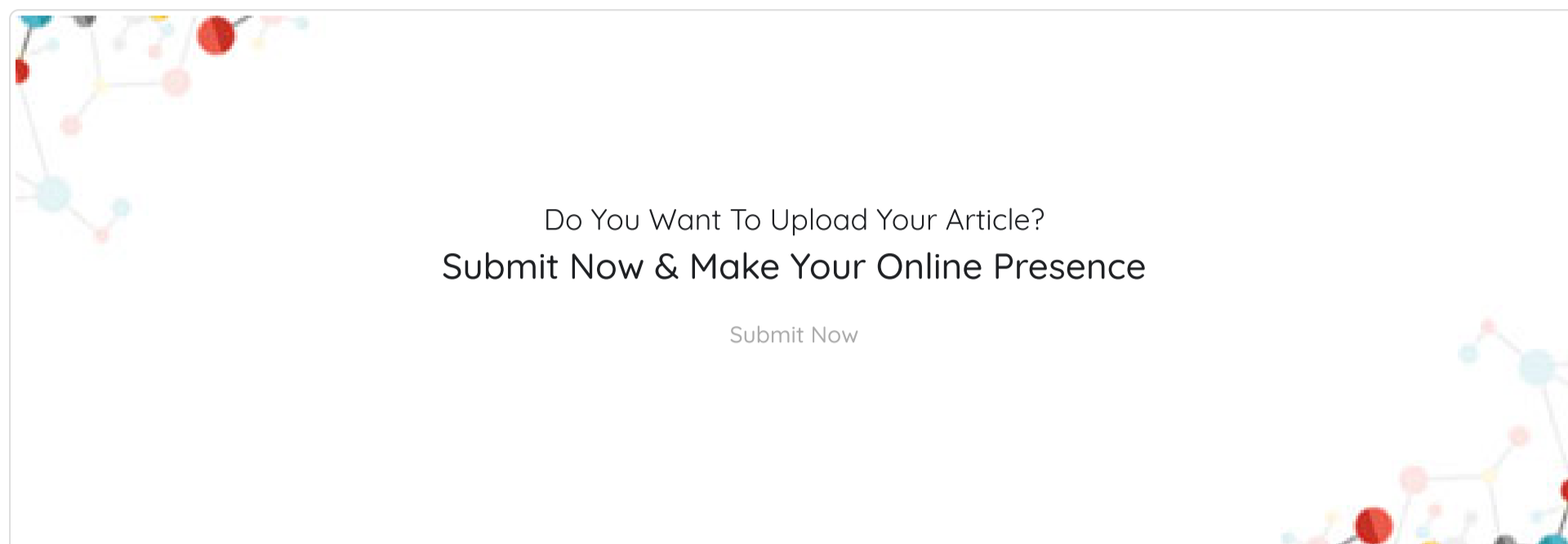
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[1](#)   [2](#) Sourav Bhattacharya<sup>1</sup>, Saurav Ranjan Das<sup>2</sup>**SBR-LATEX modified concrete: a new avenue for concrete materials, a review**

[Vol. 04 (01), June, 2023, pp. 01-07 ]

DOI: <https://doi.org/10.61429/BEST2023E01>

Use of polymer modified concrete as a construction material for structural applications in recent years is becoming gradually popular. Among the Polymers, Styrene-Butadiene Rubber (SBR)-latex modified concrete has proven strength and healthiness properties. From various Literature survey, we came to know that Styrene contributes rigidity and chemical resistance to the polymer, while butadiene contributes flexibility and elasticity. The random copolymerization of these two monomers in SBR results in a polymer with a wide range of properties, including good abrasion resistance, low-temperature flexibility, and high tensile strength. In different ratio of Styrene-Butadiene Rubber (SBR) latex-cement shows that compressive strength and flexural strength were determined at different ages. It has been observed that SBR latex has negative effect at early age while at 28 days, the addition of SBR latex in concrete results in enhancement of compressive strength as well as Flexural Strength. It can be used as an additive in concrete repair mortars, helping to improve the bond between existing concrete surfaces and the repair material, and reducing the risk of cracks forming in the repaired area, increases compressive and Flexural Strength compared with samples having old and new concrete without bonding layer.

 Rangan Mukherjee<sup>1</sup>, Ruma Ghosh<sup>2</sup>**Context aware IOT framework for integrated real time indoor classroom activity monitoring using pollution sensors**

[Vol. 04 (01), June, 2023, pp. 01-11 ]

DOI: <https://doi.org/10.61429/BEST2023E02>

As toxic substances can affect living things as well as cause disease and death in humans, air pollution has recently become a serious social issue. Currently, a vast amount of data is available to get insightful knowledge into user profiles that contain dynamic contextual information due to the popularity of IoT devices and the accessibility of wireless networks. Massive amounts of data are continuously produced by IoT sensors. Raw sensor data must be understood and used in a context-aware computing platform in order to be valuable, though. In this work an array of heterogeneous sensors coupled to an Arduino 2560 board are used to measure the concentrations of CO, NO<sub>2</sub>, CO<sub>2</sub>, particulate matter like PM<sub>1.5</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> along with temperature and humidity. Later the accumulated data analyzed for identification of different classroom events using automated technique.

 Rakhi Senapati<sup>1</sup>, Saurav Ranjan Das<sup>2</sup>, Sukalpa Dey<sup>3</sup>, Dipankar Sukul<sup>4</sup>

### Amino acid Schiff bases as efficient corrosion inhibitor for mild steel in aqueous H<sub>2</sub>SO<sub>4</sub>: a comparative study

[Vol. 04 (01), June, 2023, pp. 01-10 ]

DOI: <https://doi.org/10.61429/BEST2023E03>

Corrosion inhibitory performance of two Schiff bases prepared through condensation of two different amino acids, glycine and tyrosine with a common aldehyde, citronellal (designated as GCSB and TCSB, respectively) are compared by taking mild steel as test metal and aqueous H<sub>2</sub>SO<sub>4</sub> as the corrosive environment. Inhibition efficiencies as obtained through potentiodynamic polarization and electrochemical impedance spectroscopic methods establish TCSB as a superior corrosion inhibitor with 74 to 88 percentage of inhibition efficiency. Better corrosion mitigatory prowess of TCSB is explained in terms of various intrinsic molecular parameters, like the energy of frontier molecular orbitals (HOMO and LUMO), global hardness, softness, electrophilicity index, and others. It is revealed that two directional electron transfer, inhibitor to metal and retro-transfer, is responsible for the interaction of the Schiff bases with the metal surface. From electron distribution at HOMO and LUMO levels, atoms or functional groups present in the Schiff bases which initiate the molecular interaction with metal surface are ascertained.

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✉ Sayantan Dutta<sup>1</sup>, Anindita Pan<sup>2</sup>, Amit Kotal<sup>3</sup>, Subhajit Dutta<sup>4</sup>

### Hydrological Analysis for Annual Rainwater Harvesting Potential in BCREC Campus

[Vol. 04 (01), June, 2023, pp. 01-11 ]

DOI: <https://doi.org/10.61429/BEST2023E04>

The technical aspect of this paper is to analyse the harvested rainwater from the hydrological point of view. First of all, the considerable catchment area is found out. Total rainwater which is collected from rooftops of different buildings like departmental buildings and hostel buildings at BCREC Durgapur Campus. Then, hydrological and topographic data of the considered catchment area has been collected. Finally, the water harvesting capacity from different buildings is evaluated. Alongside, a parametric study is done to show the variation of discharge throughout the year. Finally, the potential of harvested water in number of days is estimated to find out the effectiveness of the rainwater harvesting system in BCREC campus.

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✉ Sneha Sultana<sup>1</sup>, Sourav Paul<sup>2</sup>, Aniket Sharm<sup>3</sup> a, Muskan Tiwari<sup>4</sup>

### Optimal tuning of Reconfiguration of Radial Distribution System using Quasi-Oppositional Moth Flame Optimization

[Vol. 04 (01), June, 2023, pp. 01-09 ]

DOI: <https://doi.org/10.61429/BEST2023E05>

Optimal reconfiguration and reliability enhancement are the most significant objectives in the radial distribution systems. Because, enhancing the performance of power systems at different distribution level requires the rearrangement of network. For this purpose, this paper employs a Quasi-oppositional Moth flame Optimization (QOMFO) for improving the performance of radial distribution systems. The key factors of this work are to obtain the loss minimization. Also, to check feasibility proposed method has applied on 33-bus and 69-bus radial distribution systems. In addition to that, the obtained results are compared with some other conventional optimization techniques for proving the betterment of the proposed algorithm.

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✉ Subhas Chandra Moi<sup>1</sup>, Avisek Mondal<sup>2</sup>, Joydeep Roy<sup>3</sup>, Rajkumar Barik<sup>4</sup>

**Effect of cutting parameters on surface roughness and MRR during dry hard turning of AISI 202 steel**

[Vol. 04 (01), June, 2023, pp. 01-07 ]

DOI: <https://doi.org/10.61429/BEST2023E08>

Surface roughness plays an important role in the potential performance of a mechanical component, particularly in the fatigue strength, wear rate, coefficient of friction, corrosion resistance etc. Keeping this in mind, the present work has been planned to study the impacts of cutting parameters on completed hard turning of AISI 202 stainless steel's surface roughness. Experimental design has been planned as per L9 Taguchi orthogonal array in a centre lathe using three factors – three levels of cutting input parameters. The three cutting parameters, which are speed, depth of cut and tool's nose radius have been selected for machining operation. The output responses i.e. surface roughness and MRR (material removal rate) have been measured just after the machining. A mathematical model has been developed. ANOVA has been utilised to identify the effects of input parameters on the output responses. Main effects plot and interaction plot have been created to correlate between the input variables and output responses.

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✉ Anindita Pan<sup>1</sup>, Pranoy Roy<sup>2</sup>, Amit Kotal<sup>3</sup>, Sayantan Dutta<sup>4</sup>

**An experimental study on compressive strength of bacteria induced concrete**

[Vol. 04 (01), June, 2023, pp. 01-05 ]

DOI: <https://doi.org/10.61429/BEST2023E10>

Micro cracks in concrete are frequent and leads to the degradation of concrete. Calcium carbonate precipitation caused by bacteria is a sustainable solution for crack refill technique. This paper elaborates the compressive strength of concrete with fly ash having varying dosage of addition of bacteria. Furthermore, the addition of Bacillus Subtilis to the fly ash concrete leads to higher compressive strength.

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👤 Sabbir Reza Tarafdar<sup>1</sup>, Santanu Thandar<sup>2</sup>, Tushnik Sarkar<sup>3</sup>

**Estimation of Wind Power Potential employing Weibull distribution and finding trade off of appropriate Wind Turbine: Mumbai, India**

[Vol. 04 (01), June, 2023, pp. 01-17 ]

DOI: <https://doi.org/10.61429/BEST2023E11>

Characteristics of the wind speed and wind power potential of Mumbai, India have been studied in the current work. The daily average wind speed signal at Mumbai, India for the span of 01/01/2000 to 31/12/2010 (collected from the website of the National Centres for Environmental Information (NCEI) of the NOAA) has been taken as a sample of wind speed. Weibull distribution has been employed to characterize signals. This analysis suggests that the period between July and September (Monsoon) may be considered the most active for the wind in Mumbai, India. In the second fold of the study, a comparison among several wind turbine performances on the basis of site characteristics has been carried out to choose the appropriate wind turbine for the particular site. This study is significant as a decisive method of important investment in a wind electricity project.

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👤 Chitta Sahana<sup>1</sup>, Subha Mondal<sup>2</sup>

**Analysis of a low-grade heat driven trilateral cycle with single-stage impulse turbine**

[Vol. 04 (01), June, 2023, pp. 01-06 ]

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Trilateral cycle (TLC) is preferred for low-grade heat recovery due to the absence of pinch limitation. In the present study performance of a trilateral cycle is evaluated using R245fa, R1234ze (Z) and R1233zd (E) as working fluids. A single-stage impulse turbine is considered as the turbomachine of the cycle. During the analysis, instead of considering fixed isentropic efficiency of the turbine, velocity triangles are considered for the estimation of the turbine power output. The study indicates that the TLC operating with R1234ze (Z) as well as R1233zd (E) yields power output which is comparable to that of the TLC using R245fa. Thus, for the TLC, R1234ze (Z) or R1233zd (E) may be used as the possible drop-in replacement of R245fa.

Shubham Kumar<sup>1</sup>, Sumit Kumar<sup>2</sup>, Rajib Kumar Mondal<sup>3</sup>, Amitabha Mandal<sup>4</sup>, Joyjit Patra<sup>5</sup>

## Identification of insects using an audio analysis-based machine learning technique

[Vol. 04 (01), June, 2023, pp. 01-08 ]

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The longstanding interaction between insects and humans has been valuable and lethal. Each year, insects transmit diseases that inflict property damage, but they also fertilize a significant portion of the global food supply. Similarly, new technology is necessary to reduce the number of harmful insects without damaging populations of beneficial insects. In the scope of this study, we offer an intelligent insect catcher that uses a sensor and sound analysis to capture and classify insects. We utilize audio research and machine learning technologies for the insect identification competition to assess many feature sets and create individualized training programs for each participant. We evaluated our classifiers in linear discriminant and binary class settings and discovered that a class labels classifier detecting mosquito species has near-perfect accuracy. It proves that the proposed trap is effective.



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