



“EMPOWERMENT THROUGH TECHNOLOGICAL EXCELLENCE”

GENBA SOPANRAO MOZES COLLEGE OF ENGINEERING

S. No. 25/1/3, Balewadi, Pune – 411 045

(Approved by AICTE and Govt. of Maharashtra, Affiliated to Savitribai Phule Pune University)

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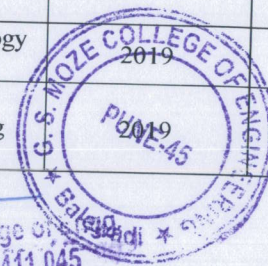
Founder President: Shri Rambhau Moze

3.3.1 Number of research papers published per teacher in the Journals notified on UGC care list during the last five years

3.3.1.1 List of Papers Published during the AY: 2019-20

Sr. No.	Title of the Paper	Name of the Teacher	Name of the Journal	Calendar Year of Publication	ISSN Number
1	Depletion of smoke by smoke free tower	Shalaka barshetty	International journal for science and advance research in technology	2019	2395-1052
2	Experimental investigation of concrete using Recron fiber	Rahul Hodage	International Journal of Innovative Research in Science, Engineering and Technology	2019	2319-8753
3	Soil Deformation Prediction in Tunneling Using Artificial Neural Networks: A Review	Shilpa R. Mahajan	Journal of Interdisciplinary Cycle Research	2019	0022-1945
4	Soil Deformation Prediction in Tunneling Using Artificial Neural Networks: A Review	Sonam Agrawal	Journal of Interdisciplinary Cycle Research	2019	0022-1945
5	Utilization of WTP Sludge in Brick manufacturing	Rahul Hodage	International journal of information and computer Security	2019	0972-1347
6	Life cycle cost analysis of road pavements	Shilpa Mahajan	International Journal of Engineering Research & Technology	2019	2278-0181
7	Experimental Investigation on Polymer Modified Ternary Blended Concrete	Vinayak B Kulkarni	Journal of Recent Activities in Infrastructure Science	2019	2582-3124
8	Experimental Investigation on Polymer Modified Ternary Blended Concrete	Vishal Panchal	Journal of Recent Activities in Infrastructure Science	2019	2582-3124
9	Experimental Investigation on Polymer Modified Ternary Blended Concrete	Dhananjay S	Journal of Recent Activities in Infrastructure Science	2019	2582-3124
10	Message Type Recognition: A Modified Neural Network Architecture with Emergency Message Transmission Protocol in VANET	Prof.Pallavi Patil	International Journal of Management, Technology And Engineering - UGC Approved Journal	2019	2249-7455
11	Critical Review On Pull-In Of Aluminium In Continuous Casting	Dr.Ritesh Fegade	INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH	2019	2277-8616
12	Finite Element Analysis of Direct Chill Casting using Concept of Element Birth and Death	Dr.Ritesh Fegade	International Journal of Recent Technology and Engineering (IJRTE)	2019	2277-3878
13	Improving the Aluminum Rolling Ingot Recovery using Tqm Technique	Dr.Ritesh Fegade	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	2019	2278-3075

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14	REVIEW ON EFFECT OF VELOCITY AND FIN PITCH ON AUTOMOBILE ENGINE CYLINDER FIN	Dr. Ritesh Fegade	INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS	2019	2348-1269
15	REVIEW ON EFFECT OF VELOCITY AND FIN PITCH ON AUTOMOBILE ENGINE CYLINDER FIN	Prof. Devendra J. Waghulde	INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS	2019	2348-1269
16	REVIEW ON EFFECT OF VELOCITY AND FIN PITCH ON AUTOMOBILE ENGINE CYLINDER FIN	Dr. A. B. Auti	INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS	2019	2348-1269
17	Vibration suppression effects on rotating wind turbine blade using a particle damping method	Dr. Santosh Sandanshiv	Vibroengineering Proceedia	2019	2538-8479
18	Effect of change in position of particle dampers on wind turbine blade for vibration suppression	Dr. Santosh Sandanshiv	Vibroengineering Proceedia	2019	2538-8479
19	Application of a Particle Damping Technique on Wind Turbine Rotor by Filling of 90 Percent Balls	Dr. Santosh Sandanshiv	International Journal of Innovative Technology and Exploring Engineering	2019	2278-3075
20	Effect of Particle Damping Technique on 1 kW Wind Turbine Blade using 3 mm Balls	Dr. Santosh Sandanshiv	International Journal of Innovative Technology and Exploring Engineering	2019	2278-3075
21	Stabilization of Black Cotton Soil by Using Construction and Demolition Waste	Prof. A. S. Dhananjaya	Journal of Geotechnical Studies	2019	2581-9563
22	Pollutant Gases Detection using the Machine learning	Dr. Jambi Ratna Raja Kumar	ScienceDirect	2019	1877-0509
23	A Smart Wearable Device for Stuttering Detection and Intervention using IoT and Machine Learning	Dr. Ratnaraja Kumar Jambi	International Journal of Business, Management and Visuals	2019	3006-2705
24	A Smart Wearable Device for Stuttering Detection and Intervention using IoT and Machine Learning	Prof. Bharati Kudale	International Journal of Business, Management and Visuals	2019	3006-2705
25	A Smart Wearable Device for Stuttering Detection and Intervention using IoT and Machine Learning	Prof. Prerana Rawat	International Journal of Business, Management and Visuals	2019	3006-2705
26	A Smart Wearable Device for Stuttering Detection and Intervention using IoT and Machine Learning	Prof. Kopal Gangrade	International Journal of Business, Management and Visuals	2019	3006-2705
27	Exploring Edge Computing Capabilities in IoT Devices for Machine Learning-Based Stuttering Prediction Models	Dr. Ratnaraja Kumar Jambi	International Journal of Open Publication and Exploration	2019	3006-2853
28	Exploring Edge Computing Capabilities in IoT Devices for Machine Learning-Based Stuttering Prediction Models	Prof. Bharati Kudale	International Journal of Open Publication and Exploration	2019	3006-2853

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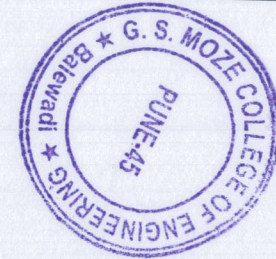
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30	Exploring Edge Computing Capabilities in IoT Devices for Machine Learning-Based Stuttering Prediction Models	Prof. Kopal Gangrade	International Journal of Open Publication and Exploration	2019	3006-2853
31	Utilizing IoT Data Streams for Continuous Monitoring and Machine Learning Analysis of Stuttering Patterns	Dr. Ratnaraja Kumar Jambi	International Journal of Transcontinental Discoveries	2019	3006-628X
32	Utilizing IoT Data Streams for Continuous Monitoring and Machine Learning Analysis of Stuttering Patterns	Prof. Bharati Kudale	International Journal of Transcontinental Discoveries	2019	3006-628X
33	Utilizing IoT Data Streams for Continuous Monitoring and Machine Learning Analysis of Stuttering Patterns	Prof. Prerana Rawat	International Journal of Transcontinental Discoveries	2019	3006-628X
34	Utilizing IoT Data Streams for Continuous Monitoring and Machine Learning Analysis of Stuttering Patterns	Prof. Kopal Gangrade	International Journal of Transcontinental Discoveries	2019	3006-628X
35	Design and Implementation of an IoT-Integrated Machine Learning Platform for Remote Stuttering Therapy and Assessment	Dr. Ratnaraja Kumar Jambi	International Journal of All Research Education and Scientific Methods	2019	2455-6211
36	Design and Implementation of an IoT-Integrated Machine Learning Platform for Remote Stuttering Therapy and Assessment	Prof. Bharati Kudale	International Journal of All Research Education and Scientific Methods	2019	2455-6211
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Depletion of Smoke By Smoke Free Tower

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Abstract- The ever-increasing population has caused increase in overall pollution. As in urban areas the density of population has increased considerably. In order to overcome this problem, we are attempting to make smoke free tower. This tower mainly works on ionization process. The type of gases found are carbon monoxide, VOCs, particulate matter. The negative ion generator helps in depleting the smoke generator. Smoke free tower mainly helps in decreasing cardiovascular diseases and asthma, etc. although the intention of this paper is to reduce the smoke generated due to indoor air pollution. The research suggests that adequate government regulation, public awareness. We are planning to investigate the ion concentration according to the presence of cigarette smoke in the room and according to the change of lit cigarette distance from the supply of ionized air.

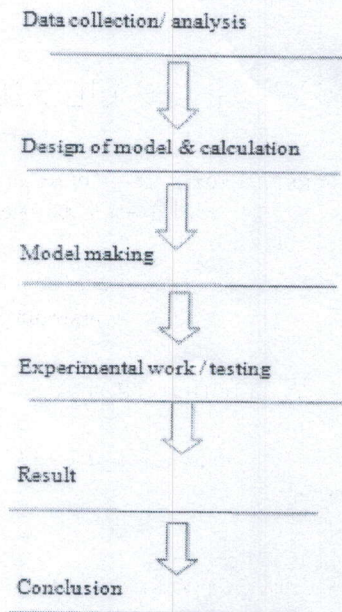
Keywords- VOC's – Volatile organic compounds, ionization, negative ion generator, smoke.

I. INTRODUCTION

Indoor air pollution is the pollution which is been produced from the household products such as lightning of candles, dhoop & incense sticks, wood & coal burning, gas stoves, heaters, fire places and chimneys. Indoor air pollution sources that releases gases or particles into the air are primary cause of indoor air quality problems. Inadequate air ventilation can increase indoor pollutant levels by not bringing in enough outdoor air to dilute emissions from indoor sources and by not carrying indoor air pollutants out of the area. Indoor air pollution contains gases like carbon monoxide, Particulate Matter, Nitrogen Gas, concentration of many VOC's (volatile organic compounds). The main motive of our project is to deplete the smoke produced due to indoor air pollution using Smoke Free Tower Dutch designer and architect Daan Roosegaarde has visited the capital of China -On July 2015, he and his team of experts have created the Smog Free Project and launched their idea at the Kickstarter site. In their presentation, they promised to build a tower, which purifier the air from the smog in the area. After being filtered, the clean air is returned to the environment without the smog particles. Furthermore, instead of throwing the waste back in the environment they decided to transform it into beautiful jewelries and use it as a reward for the people helping them funding their idea. After only about month, they managed to

do both gathering all the money needed as well as building the first tower in Rotterdam

II. METHODOLOGY



III. IDENTIFY, RESEARCH AND COLLECT IDEA

Materials used:

Use of cardboard is done for construction of tower. A negative ion generator is used for elimination of smoke particles using ionisation technique. The smoke is sucked inside the tower with the help of exhaust fan installed inverted position.

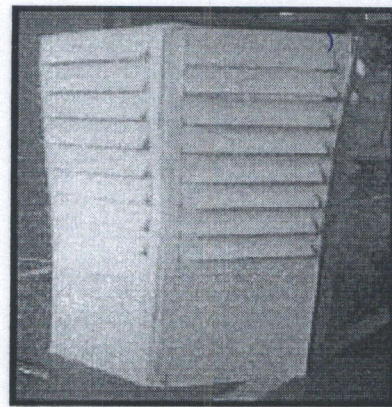


Fig. No. :- 1- Smog free tower model

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Experimental Investigation of Concrete Using Recron Fiber

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ABSTRACT: The significance of the utilization of fiber for the fortification of composite has increment amid the most recent six years as a mix of high quality solidness and warm obstruction. The quality attributes of the solid (M25) were utilized with fluctuating level of added substances was worked out giving certain extents by including Recron fiber in the level of 0%,1%, 1.5%,2% to the solid blend and changes in quality, quality get increments and functionality parameters were considered. As of now, concrete is an adaptable designing material utilized in the greater part of the structural building structure, so significant consideration is taken for improving the property of cement with particular to quality and sturdiness. Recron3s polypropylene monofilament, discrete, irregular short fiber that can be utilized in cement to control and capture breaks. It additionally exhibits the consequence of research about the mechanical properties of fiber utilizing quality just as snared steel fiber accessible in the area. Compressive quality of 3D squares were found on the 7th,14th and 28 days which was discovered that expansion of recron3s fiber effectively affect the mechanical properties of cement.

KEYWORDS: Recron3s fiber, strength, properties of concrete, arrest cracks, etc

I. INTRODUCTION

Present days since low openness of regular assets, the common Portland bond and normal sand is being utilized quickly on the planet, due to development of ventures, private structures and other cement based structures .So, the generation and use of cement and sand has been quickly expanded, So because of that parcel of warmth is produced into the environment because of hydration activity of concrete. Fiber strengthened cement is concrete containing a consistently conveyed irregular short fiber which builds its auxiliary honesty. It contains short discrete filaments and arbitrarily situated. Strands incorporate steel filaments, manufactured filaments and characteristic filaments (coconut fiber) each may fluctuate as indicated by their individual property. Moreover, the character of fiber strengthened solid changes with materials, geometries, dissemination, direction, densities. Filaments are normally utilized in cement to control breaking because of plastic shrinkage and drying shrinkage. They likewise diminish the penetrability of cement and decrease seeping of water. All the more as of late miniaturized scale strands, for example, those utilized in customary composite materials have been acquainted into the solid blend with increment its strength, or capacity to oppose break development. In the present work polyester fiber have been utilized in light of the fact that, the benefits of utilizing holding attributes of polyester which is superior to nylon because of their practical side gathering present in the polymer structure. Polyester fiber planned explicitly to furnish concrete with security against early age split arrangement. Each fiber anticipates the little gaps that can happen when cement's rigidity is weakest. By diminishing early age break development, the quantity of debilitated planes and the potential for future split arrangement may likewise be decreased. Albeit each kind of fiber has been given a shot in bond and cement, not every one of them can be adequately and financially utilized. Each sort of fiber has its trademark properties and impediments. Some kind of

Soil Deformation Prediction in Tunneling Using Artificial Neural Networks: A Review

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Abstract - Modern India's public transport landscape is witnessing a significant change with major cities getting metro rail projects. The rapid growth of urban areas has led to an increase in the number of tunnel railways that underpass existing infrastructures at shallow depths. For safe construction in complex urban environments, trenchless technology is actively undertaken to avoid interference with existing structures and avoiding re-routing of traffic. In the past few decades, as a new tool for analysis of the tough geotechnical problems, artificial neural networks (ANNs) have been successfully applied to address a number of engineering problems, including deformation due to tunneling in various types of rock mass. Unlike the classical regression methods in which a certain form for the approximation function must be presumed, ANNs do not require the complex constitutive models. Due to the heterogeneity and nonlinearity of the rock mass, the prediction of the rock mass deformation in tunneling is indispensable for optimization of the tunnel construction while simultaneously observing the safety requirements. For this purpose, ANN has been successfully applied in the deformation prediction and displacement back analysis, which seems to have good potential of time-saving and cost-effectiveness. This paper reviews the state-of-the-art of the field of ANN technology in tunnel performance prediction. This study should be helpful for tunnel assessments for upcoming metro railway projects in major cities in India.

Keywords— Artificial Neural Network, Tunnels, Back-Propagation, Geological factors

1. Introduction

Deformation prediction of the rock masses is one of the major subjects in determining the stability of the underground excavation projects. Recently, the tunnel construction is experiencing a very rapid growth in the complex geological formations and especially in urban areas where the low construction

depth and the external loading from the buildings increase risk conditions [1]. When such conditions are not recognized prior to excavation of the tunnel, however, construction delays and increase of budget might occur. Therefore, reliable prediction of the soil deformation around the tunnel is crucial for preventing project setbacks [2].

Generally, to some extent, the engineering mechanics behavior of tunnel rock masses, consisting of the deformation and failure mechanism, is neither clarified nor readily predicted, by designers and engineers, due to the uncertainties in the geotechnical environments, the heterogeneity of the rock mass, and the deficiencies in the rock mass support interaction prior to construction, as shown in Figure 1.

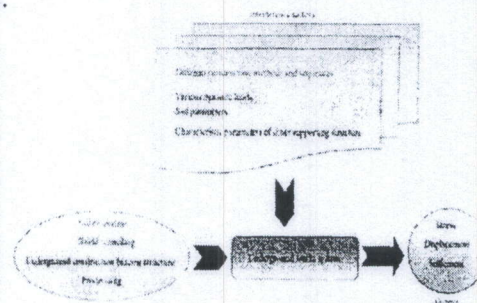


Figure 1: Underground works system frame.

Artificial neural networks (ANNs) commence as a new tool for analysis of the fuzzy geotechnical problems. The attractiveness of ANNs comes from the information processing characteristics of the system, such as nonlinearity, high parallelism, fault tolerance, learning, and generalization capability [5]. This technique allows generalizing from a training pattern, presented initially, to the solution of the problem. Once the network has been trained with a sufficient number of sample data sets a new input

Soil Deformation Prediction in Tunneling Using Artificial Neural Networks: A Review

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Abstract - Modern India's public transport landscape is witnessing a significant change with major cities getting metro rail projects. The rapid growth of urban areas has led to an increase in the number of tunnel railways that underpass existing infrastructures at shallow depths. For safe construction in complex urban environments, trenchless technology is actively undertaken to avoid interference with existing structures and avoiding re-routing of traffic. In the past few decades, as a new tool for analysis of the tough geotechnical problems, artificial neural networks (ANNs) have been successfully applied to address a number of engineering problems, including deformation due to tunneling in various types of rock mass. Unlike the classical regression methods in which a certain form for the approximation function must be presumed, ANNs do not require the complex constitutive models. Due to the heterogeneity and nonlinearity of the rock mass, the prediction of the rock mass deformation in tunneling is indispensable for optimization of the tunnel construction while simultaneously observing the safety requirements. For this purpose, ANN has been successfully applied in the deformation prediction and displacement back analysis, which seems to have good potential of time-saving and cost-effectiveness. This paper reviews the state-of-the-art of the field of ANN technology in tunnel performance prediction. This study should be helpful for tunnel assessments for upcoming metro railway projects in major cities in India.

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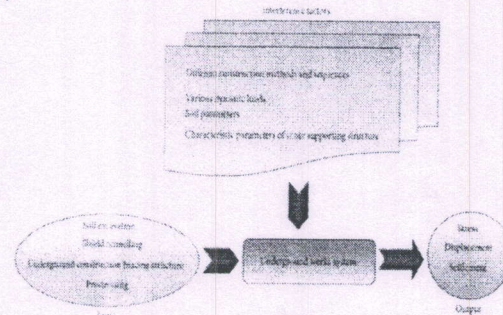


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UTILIZATION OF WTP SLUDGE IN BRICK MANUFACTURING

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Abstract – The present study investigates the possibility of using water treatment plant (WTP) sludge from Pimpri Chinchwad (Maharashtra, India) as partial substitute for clay in brick making. Due to the high content of organic matter in water sludge, incineration of the WTP sludge is necessary to remove of all organic compounds contained therein. But in our case for brick making, mixture of various proportions from 10 % to 20% by weight of sludge is added to shale are used as raw materials in hand moulding, brick making. The produced brick samples after drying process and firing at 1000 °C for 6 hrs, received a series of tests including compressive strength, Water absorption and efflorescence test. Satisfactory results were achieved when the percentage of sludge was up to 18% (by wt.) or less in the mixture. The test results indicate that, the sludge proportions are one of the most important key factors determining the brick quality. Reuse of sludge as a construction and building material converts the waste into useful products that can alleviate the disposal and environmental problems.

Keywords - Water treatment plant sludge, Clay bricks, Waste recycling, Characteristics of sludge, Tests on sludge.

I. INTRODUCTION

All 'Water treatment plants' generates sludge: a Water treatment plant is considered as treating of Water. During the treatment to the Water, some amount of semi-solid waste is generated. This waste is used or disposed in environmental friendly manner. The need for effective sludge management is continual & growing. In addition, the sludge generated by more advanced treatment is more difficult than the sludge produced by less advanced treatment. This project, describes the major use / disposal of sludge i.e. Preparation of bricks from sludge. This project provides an alternative for clay or any other material used for brick making.

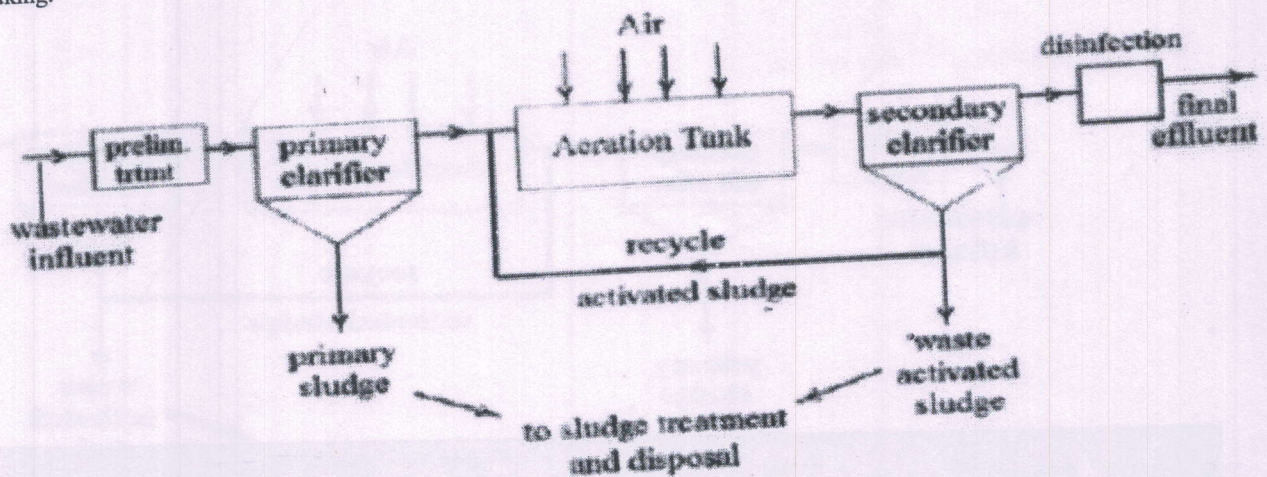
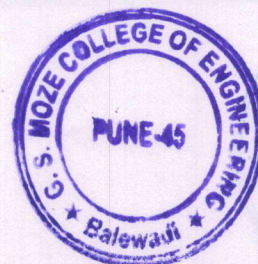


Fig1. Water Treatment Plant

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Life Cycle Cost Analysis of Road Pavements

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Abstract— LCCA for the Road – It is the process for determining the total cost of road pavements including initial construction cost, operational and maintenance cost. To reduce the life cycle cost of road pavements it is necessary to deal with the initial cost and need to learn preventive maintenance of pavements. The proper implementation of preventive maintenance techniques for road pavements can extend the life of a pavement structure in a cost-effective manner. Different Researchers in the field of road construction have found that Economic and Sensitivity Analysis can be used as methods to analyze LCCA results found by NPV and IRR with different affecting input parameters. This paper describes the procedure of estimation of different costs required for LCCA of roads, and also the methodology of LCCA is being described with suitable road data.

Index Terms—LCCA of road pavements, preventive maintenance, NPV, IRR, maintenance cost, user cost

I. INTRODUCTION

In any economy transport infrastructure act like a baseline to ensure continues smooth flow of movability of public and goods as input and output from all economic sectors

Roads are among the most important public assets in all countries. Road improvements bring immediate and sometimes dramatic benefits to road users through improved access to hospitals, schools, and markets; improved comfort, speed, and safety; and lower vehicle operating costs for these benefits to be sustained, road improvements must be followed by a well-planned program of maintenance

LCCA is a process of evaluating the economic performance of a structure over its entire life.

LCCA is especially useful when project alternatives that fulfil the same performance requirements, but differ with respect to initial costs and operating costs, have to be compared in order to select the one that maximizes net savings.

LCCA for road is required because roads, and means of transport. make a crucial contribution to economic development. Poorly maintained roads constrain mobility, significantly raise vehicle operating costs, increase accident rates and their associated human and property costs, and are needed to be deal.

To reduce the overall cost of the road right from construction cost to its repair cost the high quality material constructions with regular preventive maintenance is required "Preventive Maintenance: Work undertaken that

preserves the existing pavement, retards future deterioration, and improves the functional life without substantially increasing the structural capacity

Neglected roads steadily become more difficult to use, resulting in increased vehicle operating costs (more frequent repairs, more fuel use) and a reluctance by transport operators to use the roads. This imposes a heavy burden on the economy: as passenger and freight services are curtailed, there is a consequent loss of economic and social development opportunities

II. DIFFERENT COST OF LCCA OF ROAD PAVEMENT

Two groups of people are affected by Roads with respect money, the first group of people is of organizations/institutes constructing and maintaining roads and the second group of people is people using the roads. So we need to deal with two costs incurred first is construction cost and second is user cost.

1. Construction and Maintenance cost (C&M cost) (Direct costs) includes the following costs

- Reconnaissance Survey
- Traffic Surveys
- Topographic Surveys
- Soil And Materials Investigations
- Geo-Technical Investigations
- Carrying Out Hydraulic Surveys And Hydrological Studies
- Land Acquisition
- initial construction
- maintenance cost
- rehabilitation costs

2. User Cost includes the following costs (Indirect costs)

- Vehicle operating costs
- User delay costs
- Accidents cost includes both for fatality, non-fatal injury, and property damage only.

III. COST ESTIMATION PROJECT

1. The rates of various items of construction work have been analysed as per procedure laid down in the "MORT&H Standard Data Book"-2017 (Fifth Revision) and guidelines set in

Experimental Investigation on Polymer Modified Ternary Blended Concrete

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DOI: <http://doi.org/10.5281/zenodo.2629495>

Abstract

Research in the field of concrete has led to the development of various new types of concrete which are superior to conventional concrete with respect to strength and durability. One such type of concrete is the polymer modified concrete, in which polymer is added to the concrete during the mixing stage of the ingredients of concrete to modify its properties in fresh as well as in its hardened state. The main objective of this experimental study is to investigate the behaviour of polymer modified ternary blended concrete with varying percentages of polymer in it. Different percentages of silica fume are replaced and polymer addition are studied as 8%, 12% and 0%, 1%, 2%, 3%, 4%, 5%, & 6% respectively. Quantity of fly ash replaced is 30%. The investigation carried out in this work shows that the addition of polymer modified ternary blended concrete with 8% silica fume (cement replacement), 30% fly ash (cement replacement) and 3% styrene-butadiene rubber latex polymer is stronger than polymer modified ternary blended (PMTB) concrete made with 12% silica fume (cement replacement), 30% fly ash (cement replacement) and 2% styrene-butadiene rubber latex polymer.

Keywords: Compressive Strength, Fly Ash, Pozzolana, Silica Fume, Styrene- Butadiene Rubber Latex Polymer, Tensile Strength, Ternary Blended Concrete

INTRODUCTION

Concrete is a composite material made up of materials like coarse totals installed in a framework and bound together with bond or fastener which fills the space between the particles. Bond is the most critical material in development industry as it is utilized at various phases of development as mortar or cement. The large scale production of cement adds pollution to the environment. Each ton of Portland cement production results in about one ton of carbon dioxide into the environment. Along these lines. it is important to locate an option for bond. One such option is smaller scale silica, which is a result in the creation of basic silica or compounds containing silicon. The most valuable employments of silica smolder in cement are on the grounds that it is an extremely responsive pozzolana. Addition of fly ash

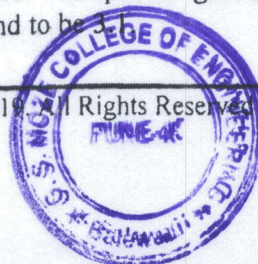
to concrete enhances it properties and reduces the use of cement, as it can replace a part of total quantity of cement to be used.

OBJECTIVE OF THE STUDY

The main objective of this experimental study is to find strength properties such as compressive strength, tensile strength and to deduce optimum dosage polymer styrene-butadiene rubber (SBR) latex for concrete made of cement, aggregates, polymer, silica fume, fly ash and super plasticizer.

MATERIALS AND METHODOLOGY

Cement: 43 grade ordinary Portland cement (OPC) was used for all concrete mixes. The specific gravity of cement was found to be



Experimental Investigation on Polymer Modified Ternary Blended Concrete

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Abstract

Research in the field of concrete has led to the development of various new types of concrete which are superior to conventional concrete with respect to strength and durability. One such type of concrete is the polymer modified concrete, in which polymer is added to the concrete during the mixing stage of the ingredients of concrete to modify its properties in fresh as well as in its hardened state. The main objective of this experimental study is to investigate the behaviour of polymer modified ternary blended concrete with varying percentages of polymer in it. Different percentages of silica fume are replaced and polymer addition are studied as 8%, 12% and 0%, 1%, 2%, 3%, 4%, 5%, & 6% respectively. Quantity of fly ash replaced is 30%. The investigation carried out in this work shows that the addition of polymer modified ternary blended concrete with 8% silica fume (cement replacement), 30% fly ash (cement replacement) and 3% styrene-butadiene rubber latex polymer is stronger than polymer modified ternary blended (PMTB) concrete made with 12% silica fume (cement replacement), 30% fly ash (cement replacement) and 2% styrene-butadiene rubber latex polymer.

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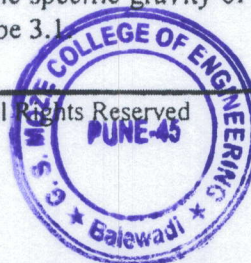
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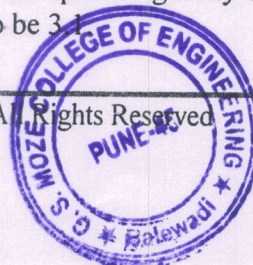
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Message Type Recognition: A Modified Neural Network Architecture with Emergency Message Transmission Protocol in VANET

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Abstract

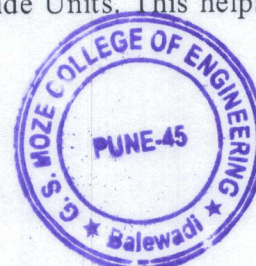
The Vehicular Ad-hoc Networks means VANET get used to broadcast emergency messages in advance to avoid traffic accidents and traffic congestion between the vehicles. It is very important to deliver the emergency message within right time and to the right/interested vehicles. Such kind of protocol is required to get real time information of each and every vehicle on the road then will consider the nearby vehicles and interested vehicles to broadcast the message within the appropriate time. Thus we proposed the advance Message Type Recognition: A Modified Neural Network Architecture with Emergency Message Transmission Protocol in VANET. It works on interested vehicles read acknowledgement and will further update or rebroadcast message about the current situation on road like traffic jam, accidents and alternative routes. It will help daily route vehicle.

Keywords: VANET-Vehicular Ad Hoc Networks, Multihop Network, Position Based Protocol, Shorted routing, Fasted routing

1. Introduction

In VANET safety communication is accomplished through two methods, first is Periodic Safety Message termed as Beacon and second is the Event Driven Message referred as the Emergency Warning Messages and they both are being shared by using a single control channel. In this the beacon message are the status messages that encloses the information on sender vehicle like it's current position, speed and direction heading toward such kind of messages and then these messages are send to the neighbour vehicles 10 messages each second. EWM- Emergency Warning Messages are generated as a vehicle, when it identifies a potentially dangerous situation on the road. These messages are warning messages that are transmitted to all other vehicles that are travelling on the road with the intention of diverting them to other clear roads. The distribution of the emergency message is carried out in a broadcast fashion such that all the vehicles reside in the certain coverage area will receive the alert messages. The emergency warning messages (EWM) are usually generated from the source vehicle to all other neighbour vehicles in order to reduce number of accidents by means of warning the drivers about the danger. The safety network encloses the sensors and OBU- On Board Units that are installed on the RSU-Road Side Units. This helps to

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Critical Review On Pull-In Of Aluminium In Continuous Casting

R. S. Fegade, Dr. R. G. Tated, Dr. R. S. Nehete,

Abstract: This study offers a comprehensive review of the research articles related to the continuous casting for a selected grade of Aluminium alloys. Data were obtained from various articles between the years of 1976 to 2018 in journals and conference proceedings. Five categories have been distinguished based upon the studies of casting surface defects, casting speed effects, mould parameters, thermal and heat flow and other continuous casting survey. The most important defect produced is Pull-in of the casting which results due to improper control over solidification parameters. Many researchers discussed the issues of steel casting and rolling ingot defects such as crack, cold shut, run out, filter puncture and drag marks. Rare research work was found on the Pull-in problem in the rolling ingot of aluminum casting. Researchers attempted to solve this problem by CFD approach or by Finite element analysis approach for steel casting, but there is ample scope for modeling to be developed for many casting grades of aluminum alloys. So there is need to develop model for selected aluminum alloys continuous casting.

Index Terms: Aluminium Rolling Ingot, Continuous Aluminium Casting, Pull In, Rolling Ingot defect, shell zone, solidification.

1. INTRODUCTION

CONTINUOUS casting is the primary method in the production of Aluminium billets, blooms or slabs. In the continuous casting process, the molten aluminium pours from ladle through tundish to the water cooled mould by a submerged entry nozzle. The molten metal gets solidified into "semis" and subsequently pulled/rolled out into final product [1, 2]. The tundish also used as a refining vessel to float out detrimental inclusion which may cause surface defects and internal stress concentration during rolling operation. It is important to control the casting speed to avoid the defects in final mould. Casting speed needs to maintain same with incoming liquid metal, so the process ideally runs in steady state. The critical part of the continuous casting process is initial solidification process at the meniscus, where the surface of the final mould produced. An oil or mould slag can be added in this part to avoid the surface defects. In recent years, there is need to advancement in engineering and technology is to provide high quality of casting product to all leading manufacturing industries paper.

2 A FRAMEWORK FOR CLASSIFICATION

This review paper summarises the studies on different parameters and defects in the direct chill casting process for aluminium alloys. Five different categories have been distinguished to study the casting defects and effect of various parameters. In casting process, mechanical and metrological problems arise due the various heat treatments and handing process.

2.1 Studies on casting surface defects

This theme deals with casting defects like longitudinal transverse crack, flat surface analysis, bubble damage and fracture study, scheduling problem in aluminium casting centre, air gap formation due to shrinkage, curvature as the

base of ingot for steel, oxide film defect, meniscus defect, porosity hydrogen, shrinkage porosity defect, non-invasive slag detection.

2.2 Studies on Casting speed effects

Casting speed effects on various factor in continuous casting like solidification behaviour, mushy region thickness.

2.3 Studies on Mould parameters

In the mould design various parameter affected like a gap between shell and mould, mould slag frication, mould filling, mould thickness etc.

2.4 Studies on Thermal and Heat flow

The included Thermal Stresses and Solidification Behaviour Stress, Deformation Temperature Flow, Super Heat Flow, Heat flow analysis, heat flux analysis etc.

2.5 Other continuous casting surveys

There are several other models and study can be found in continuous casting process such as metal quality, viscosity mathematical model developed, composite interface, materials properties, DOE techniques.

3 REVIEW OF LITERATURE

3.1 Studies on casting surface defects

The current understandings of casting surface defects from the recent studies are longitudinal transverse crack, flat surface analysis, bubble damage and fracture study, air gap formation due to shrinkage, shrinkage porosity defect, and non-invasive slag detection [3, 4]. Cracks are occurring on the surface and internal body are common in the continuous casting process. Surface cracks are serious dispute because it oxidizes more in rolled product; also it causes the strand to be scrapped due to longitudinal cracks. Strand causes thermal gradient and thermal stress. Longitudinal cracks may happen due to improper mould design and uneven cooling. Air gap formation continuous casting process between the solidified shell and wall has an adverse effect of process efficiency. Liquid metal changes the phase from liquid to solid state during solidification which causes the shrinkage in ingot, it causes the change in size of the final product. It reduces the quality of the continuous casting process. An extensive study on the surface defect during the continuous casting process

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Finite Element Analysis of Direct Chill Casting using Concept of Element Birth and Death



R. S. Fegade, R. G. Tated, R. S. Nehete, D. G. Parle

Abstract: A direct chill (DC) casting is a continuous casting process widely used in different industries. The aim of the work is to investigate thermal and mechanical stress formed during the direct chill casting process by a numerical method. A commercial software ANSYS mechanical APDL is used for the simulation. A moving mesh technique is employed for the development of ingot during the solidification process. An element birth and death concept is used to find out the deformation in ingot. The verification of the results is done with the results found in literature and found a good agreement. The developed model has admirable ability to predict the thermal and mechanical stress formed in direct chill casting process.

Keyword: Finite Element (FE) Analysis, Element birth and death, Direct chill casting, heat transfer, stress.

I. INTRODUCTION

Direct chill (DC) casting is one of the widely used continuous casting process in light weight processing technology. Direct chill casting is a technique for producing different shaped solid ingots and billets from non-ferrous metals and alloys especially copper, aluminium, magnesium. Aluminium and their alloys are the most usual material for the direct chill casting [1]. In the process of direct chilling, ingots are subjected to rapid cooling by bottom block and water sprays along the sides of the wall which cause sufficient solidification of the liquid metal around the outer surface of the mould. The liquid metal acquire the shape of the mould with sufficient mechanical strength [1]. Thermal and mechanical stresses are formed due to the direct cooling from water spray during the direct chill (DC) casting process. This stress develops cracks which cause failures in ingots [1], [2]. A mechanism of solidification and cooling of liquid metals is very important for successful cast billets and ingots. A schematic of the direct chill casting is shown in figure 1. Typically A liquid metals are cooled below their freezing

point before solidification takes place. The crystal growth of liquid metal depends on the temperature of the surrounding material. The temperature at the surface of the mould is far lesser than the liquid metal, hence the solidification is faster at the mould surface. The liquid metal temperature is higher at the center of the ingot than the mould surface hence a solid

phase can be seen at the surface of the mould and liquid phase at the center of the ingot. This can be seen in figure 1 which causes the two separate phases into the ingot (solid ingot ad liquid ingot). Various experimental and numerical techniques were used to analyze the effects and process of direct chill casting process. A FEA and CFD analysis techniques can easily predicts the thermal and mechanical behavior during the direct chill casting process [3]-[6]. A heat transfer through conduction and solidification governing equations are used for the FEA and CFD analysis of direct chill casting process. Loon et al. [3] demonstrated a CFD model to identify the solid-liquid interface and heat flow for various casting speeds. There are several compositional changes occur in solid-liquid phase due to the concentration in their interface which causes a base to curl upward. This phenomena is known as "butt curl" which will further affect surface contact between ingot and bottom block. This will develop thermal and mechanical stresses in ingot leading to cracks and tears. The direct chill casting technique is commonly used due to their benefits such as the reduction in centerline segregation, a better-quality homogeneous structure, better mechanical properties and lower and faster production cost [1]. However, the process having the limitations such as hot tearing, poor surface quality and macro segregation [7]-[9].

A study of failures due to thermal and mechanical stresses occurs in the ingots are the attraction of the researchers. Numerical analysis with the help of mathematical model or commercial software was presented in literature. Li et al. [4] developed a coupled coupled finite element model (CON2D) to analysis the shell behavior in continuous casting process for still. Their model can be used to predict the temperature, shape and thermal stress during the casting process. A heat conduction, solidification, elastic-viscoplastic creep constitutive equation were solved numerically. Validation of the numerical model was done by comparing the results of both temperature and stress. Weckman and Niessen [10] solved steady state thermal problem of D. C. casting using finite element technique for A6063 aluminum material. An effective heat transfer coefficient were calculated for vertical position of ingot. Zhang et al. [11] did a CFD analysis in commercial software FLUENT using coupled modelling during low frequency electromagnetic D. C. casting.

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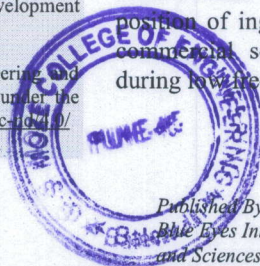
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Improving the Aluminium Rolling Ingot Recovery using Tqm Technique



Ritesh S. Fegade, Rajendrakumar G. Tated, Rupendra S. Nehete

Abstract: To improve productivity and profitability in Aluminium continuous casting industry the main action is to reduce losses due to defects resulting into revenue losses. Improving Rolling Ingot Recovery is possible by reducing the rejections & using the resources effectively (resources MAN, MACHINE, MATERIAL & CAPITAL) by applying TQM technique. This study presents a case about minimizing defects in aluminium continuous casting using Total Quality Management (TQM) techniques in which why-why analysis, Standard Operating Procedures (SOPs), and Cause and Effect analysis is used. It can be concluded from study that rejections, shell zone & inclusion can be reduced by, Continuous monitoring the health of the moulds, quality & quantity of water, the metal casting temperature, metal head in mould, water impingement angle, use of Ceramic foam filter plates, awareness & the adherence towards the guidelines.

Keywords: Aluminium Casting, Aluminium Rolling Ingot, Cause and Effect, Rolling Ingot defect, Standard Operating Procedures (SOPs), Why-Why analysis.

I. INTRODUCTION

Aluminum continuous Casting is the backbone of mechanical manufacturing industry and it is the prime goal of any organization to reduce defects and rejection for revenue generation and survival in the global competitive market for resilience and robustness. Main extract of various researcher in the literature reviewed is to promote higher productivity with least wastage or reduced rejection with good quality by applying various quality tools. As the industries are producing with full capacity to meet varying demands and the conventional quality techniques for maintaining quality of the product is no more contemporary.

II. REVIEW CRITERIA

Various authors have carried out research in Aluminium alloy castings and its reduction and still there is always a scope for further research due to complex nature of alloys and processes. Fengming Du (2018) [5] has worked on the full-scale finite element model of a slab and its mould was developed to reveal the complex thermo-mechanical behaviours of slab in a vertical caster during continuous casting. An inverse algorithm was applied to calculate the heat flux and combined with the temperatures measured using thermocouples that were buried in different positions of the mold. It will provide a helpful tool for further improving and optimizing the operation parameters for continuous casting slab.

X Dai, *et al.* (2012) [13] have developed the new model, which is a two-dimensional program using two methods first one is finite difference technique and second one is the Marker and Cell (MAC) method to simulation of the flow of molten metal in a mold.

P. Senthil *et al.* (2012) [9] have worked on to prepare AC2A aluminium alloy castings of a unsymmetrical component using squeeze casting process and finding the optimum squeeze casting conditions also developed the mathematical models for the same process.

R. S. Taufik *et al.* (2013) [10] were prepare and developed thermal expansion model for casted aluminium silicon carbide the squeeze casting method.

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Review on Effect of Velocity and Fin Pitch on Automobile Engine Cylinder Fin

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Abstract-- The rate of heat flow per unit basis surface increase in direct proportion to the added heat conducting surface. The arrangement of fins and their geometry in an array are the most important criteria, to dissipate heat from the cylinder surface. An air cooled motorbike engine dissipates waste heat from the cylinder through the cooling fins to the cooling air flow created by the relative motion of moving motorbikes. It is necessary to study the effect of fin geometry, material, and climatic conditions to the behaviour of heat transfer through fins. So, this study is useful to know the effect of fin pitch and velocity on heat transfer through automobile engine cylinder fins.

Keywords: Fin, Pitch, I.C Engine Cylinder, Heat Transfer.

I. INTRODUCTION

As the fossil fuel reserves are depleting day by day, increasing of fuel price raising the technology towards new inventions and research, which provides engines which are highly efficient and produces high specific power. Air cooled engines are phased out and are replaced by water cooled engines which are more efficient, but almost all two wheelers uses Air cooled engines, because Air-cooled engines are only option due to some advantages like lighter weight and lesser space requirement. The heat generated during combustion in IC engine should be maintained at higher level to increase thermal efficiency, but to prevent the thermal damage some heat should remove

from the engine. Extended surfaces (Fins) are one of the heat exchanging devices that are employed to increase the heat transfer on engine cylinder. It is necessary to analyze the heat transfer rate of the fins. Experiments has been made to increase fin efficiency by Changing fin material, climatic conditions around fins, varying pitch of the fins, using perforations and notches in fins and fin geometry. Figure 1.1 shows the engine cylinder block.

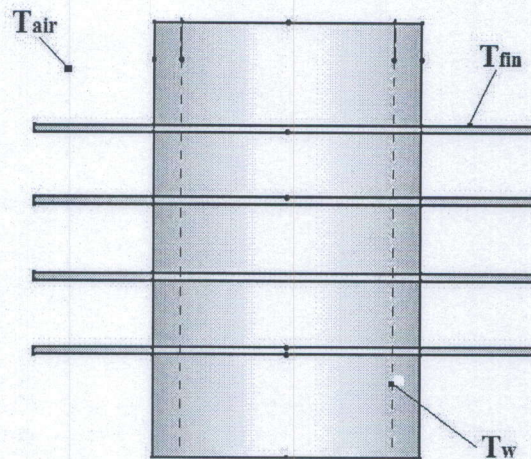


Figure 1.1: Temperature in engine cylinder

An air cooled motorbike engine dissipates waste heat from the cylinder through the cooling fins to the cooling air flow created by the relative motion of moving motorbikes. The cooling system is an important engine subsystem. The air cooling mechanism of the engine is mostly dependent on the fin design of the cylinder head and block. It also

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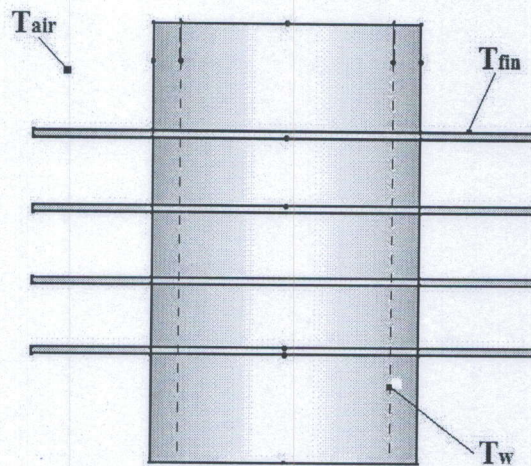
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Abstract-- The rate of heat flow per unit basis surface increase in direct proportion to the added heat conducting surface. The arrangement of fins and their geometry in an array are the most important criteria, to dissipate heat from the cylinder surface. An air cooled motorbike engine dissipates waste heat from the cylinder through the cooling fins to the cooling air flow created by the relative motion of moving motorbikes. It is necessary to study the effect of fin geometry, material, and climatic conditions to the behaviour of heat transfer through fins. So, this study is useful to know the effect of fin pitch and velocity on heat transfer through automobile engine cylinder fins.

Keywords: Fin, Pitch, I.C Engine Cylinder, Heat Transfer.

I. INTRODUCTION

As the fossil fuel reserves are depleting day by day, increasing of fuel price raising the technology towards new inventions and research, which provides engines which are highly efficient and produces high specific power. Air cooled engines are phased out and are replaced by water cooled engines which are more efficient, but almost all two wheelers uses Air cooled engines, because Air-cooled engines are only option due to some advantages like lighter weight and lesser space requirement. The heat generated during combustion in IC engine should be maintained at higher level to increase thermal efficiency, but to prevent the thermal damage some heat should remove

from the engine. Extended surfaces (Fins) are one of the heat exchanging devices that are employed to increase the heat transfer on engine cylinder. It is necessary to analyze the heat transfer rate of the fins. Experiments has been made to increase fin efficiency by Changing fin material, climatic conditions around fins, varying pitch of the fins, using perforations and notches in fins and fin geometry. Figure 1.1 shows the engine cylinder block.

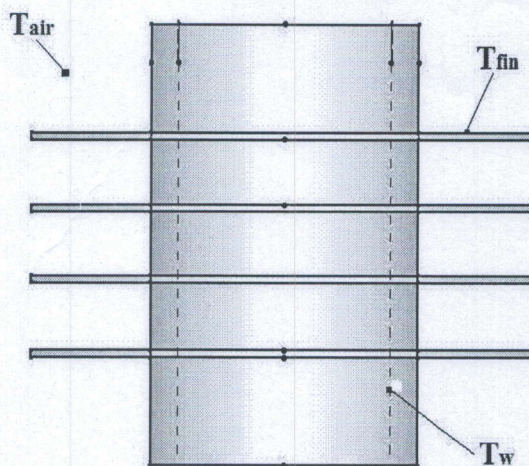


Figure 1.1: Temperature in engine cylinder

An air cooled motorbike engine dissipates waste heat from the cylinder through the cooling fins to the cooling air flow created by the relative motion of moving motorbikes. The cooling system is an important engine subsystem. The air cooling mechanism of the engine is mostly dependent on the fin design of the cylinder head and block. It also

Vibration suppression effects on rotating wind turbine blade using a particle damping method

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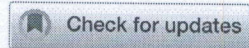
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Abstract. Due to the vibration of the wind turbine blade, the rate of electricity generation gets reduced. In this research, the focus is on reduction of wind turbine blade vibration. The important point is that in the attempt of vibration suppression, a new method of damping named particle damping has been tried. The novelty of this study is that this method is adopted for the first time in wind turbine blade for rotating condition. In this method, containers filled with spherical particles are mounted at four different positions on each blade alternatively. Taking tests at different rpm and container positions gives a different vibration suppression effect as compared to without damping and finding optimum positions for mounting of damper.

Keywords: wind turbine blade, vibration suppression, damper.

1. Introduction

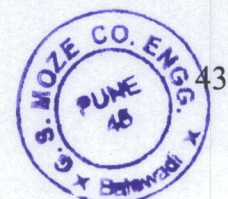
Control of vibration in blade is necessary as it adversely affects electricity generation. According to Thomsen [1], the main modes of vibration in the blade are edgewise and flap wise. According to Dapeng [2], edgewise vibration is the main problem in most of the blades. Giguere [3] gives a characteristic which provides important findings of dynamic characteristics. Mainly load acting on the blade is wind load and many scientists have already worked by blade element momentum method (BEM) for calculating aerodynamic load of a blade. Extreme wind turbine load investigation, using different methods, are studied by Saranyasontorn [5]. Typhoon winds are critically analyzed for the investigation of turbulent conditions, Ishizaki [4]. The damage of structural parts like nacelle cover and blades of wind turbine are investigated by Maalami [6] and Duquette [7]. Passive damper is inserted in wind turbine tower for minimizing vibration induced by wind loads, Murtagh [8]. Krenk [11] introduces active struts mounted near the root of each blade for reducing blade vibrations. For mitigating edgewise vibrations active tuned mass damper is investigated by Fitzgerald [10]. A roller damper and a tuned liquid column damper (TLCD) inside a rotating blade are introduced by Box and Khan [11, 12]. For multi mode vibration reduction of offshore wind turbine under seismic excitation, Hussan [13] introduces a multiple tuned mass damper (MTMD) technique.

The use of particle damping in wind turbine blade is not much explored in as found through the relevant literature. Therefore, in this research the focus is on the same.

2. Particle damping method

The use of a particle damping method is based on the ability of contact interactions using a small number of parameters that capture the most important contact properties. Forces between cavity walls and individual particles are calculated based on force-displacement relations.

Forces created due to particle-cavity and particle-particle impacts are the main aspect for modeling. Spherical particles, A and B with radii r_A and r_B with particle centres separated by distance D is shown in Fig. 1(a). At approach e is positive, at that time two particles interact with each other. The approach can be defined as:



Effect of change in position of particle dampers on wind turbine blade for vibration suppression

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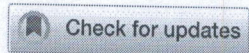
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Abstract. Wind turbine energy minimizes due to vibration of blade. In this research we focus on vibration suppression by using particle damping technique. Containers are used for fill the particles and mounted on the blade. As vibration of blade increases, it increases the movement of containers along with particles this brings particle to particle and particle to container wall collision takes place which results to energy loss. In this study we use four different positions for mounting containers, firstly on all four different positions we mount containers simultaneously and take three readings for three different ball sizes respectively, keeping 50 % fill constant in all readings. Then we reduce one container among four and take the readings. Repeat this procedure up to single container. Compare with damping results with without damping results and finding out optimum locations for mounting of dampers.

Keywords: vibration, particle damping, wind turbine blade, energy loss.

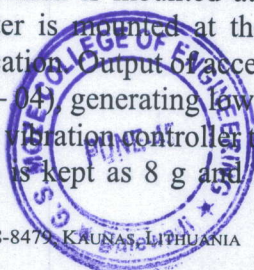
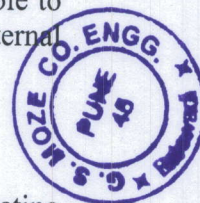
1. Introduction

In wind energy power generation, if vibrations of the blade are high then it adversely effect on electricity generation [1]. Edgewise vibration and flapwise vibrations were the two main modes of vibration in blade [2]. Edgewise vibration is the main concern in this work. Structural vibration had been control by three methods namely active, semi active and passive control according to Dapeng [3]. Krenk [4] introduced active struts mounted near the blade root. Fitzgerald introduced edgewise vibration mitigation by using active tuned mass damper [5]. According to Box [6] active tendons was inserted inside blade for vibration control. Box [7] was introducing roller damper in blade. The new concept as tuned liquid column damper (TLCD) for blade vibration reduction, passive damping was used by Colwell [8] and Murtagh [9] in wind turbine tower for control of vibrations.

In this paper particle damping technique is used to check the effect of different parameters on 1 kW wind turbine blade for vibration suppression. Three parameters are used such as particle size variation, change in position and change in percentage fill. At this moment it is not possible to make pocket inside the blade for inserting balls. But for checking the effect we attach external container on blade.

2. Experimental set up

Electrodynamic shaker (EEV 060) having force rating of 600 Kgf is use for generating frequency in the range of 10 Hz to 2000 Hz and Acceleration is consider for the first two modes. We consider 1 Kw wind turbine blade for testing which is mounted at the root location and hermetically sealed type piezo electric accelerometer is mounted at the position of 600 mm randomly considering the maximum displacement location. Output of accelerometer is connected to single channel, digital vibration controller (EESC – 04) generating low electric signals. These electric signals amplify with power amplifier from the vibration controller to a proportionally high voltage and high current output. Acceleration range is kept as 8 g and frequency range up to



Application of a Particle Damping Technique on Wind Turbine Rotor by Filling of 90 Percent Balls

Santosh R Sandanshiv, Umesh S Chavan



Abstract: *Vibration of wind turbine blade is one of the major important obstacle to increase the capacity of electricity generation. Particle damping technique is introduced in wind turbine blade to check the vibration suppression. Damper is mounted on blade externally. RPM of blade, position of dampers, are the variable parameters used in this parametric study keeping particle size as 9 mm and percentage fill in damper is 90 %. Experimental test is conducted in all the research work. Without damping results are compared with with-damping results and find out the vibration suppression regions.*

Keywords : *wind turbine rotor, particle, damper, vibration*

I. INTRODUCTION

Vibration in wind turbine brings major issues concerning to power generation. Many researchers studied by focusing on vibration of blade. Krenk [01] shows active struts located near the root of every blade for reducing blade vibrations. Duquette [2] investigated structural part is damage at nacelle cover and blades of wind turbine. Dapeng [3] shows edgewise vibration is the main issue in most of the wind turbine blades. Typhoon also creates problem in generating power, Ishizaki [4]. Giguere [5] gives dynamic characteristics of machine as it requires controlling vibration in blade which is necessary, as it adversely affect on electricity generation. Edgewise and flap wise modes of vibration is the main concern in blade according to Thomsen [6]. Khan [7] invented a tuned liquid column damper (TLCD) in a rotating blade. Active tuned mass damper in investigated by Fitzgerald [8] for mitigating edgewise vibrations. Saranyasootorn [9] investigated extreme wind turbine load using different methods. Murtagh [10] shows the effect of passive damper inserted in turbine tower for suppressing vibration created by wind forces. Multiple tuned mass damper (MTMD) technique is introduced by Hussan [11] for multi-mode vibration suppression of offshore wind turbine considering seismic excitation. Mainly, load acting on the blade is wind load and many scientists have already worked by blade element momentum method (BEM) for calculating aerodynamic load of a blade Sandanshiv [12]. In this research

work introducing particle damping technique on wind turbine blade.

II. PARTICLE DAMPING TECHNIQUE

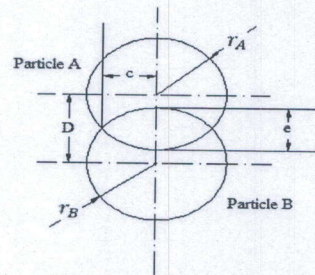
In particle damping technique, as many particles moves then collision of one particle to other takes place also collision of particle to container wall takes place. And due to this collision a lot of energy gets wasted and energy loss occurs. In this paper contains particle damping study included the damper which contains number of spherical balls. This dampers are mounted on blades, so as blades rotates at that time collision in balls takes place as well as collision in ball and container wall takes place resulting in energy loss and due to this energy loss vibrations reduces. And in this way achieves suppression effect. Fig. 1. (b) Shows spring mass diagram of particle and container wall and Fig. 1 (c) shows spring mass diagram of particle and particle. Governing equations for this suppression shows as follows. Fig. 1 (a) shows two spherical particles A and B having radii r_A and r_B . Both particles centres are separated by a distance D . e is called as approach between two particles and c is the radius of circular area.

$$e = (r_A + r_B) - D$$

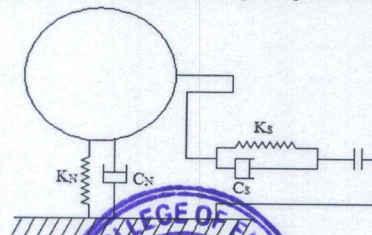
Contact forces between two colliding balls becomes

$$\vec{f} = f^n \cdot \vec{N}^n + f^s \cdot \vec{N}^s$$

Where, f^n = Normal force, f^s = Shear force, \vec{N}^n = Unit vector in normal direction and \vec{N}^s = unit vector in shear direction.



(a) Particle - Particle impact parameters



(b) Particle-wall spring mass diagram

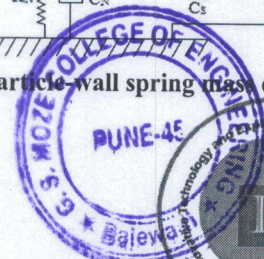
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Effect of Particle Damping Technique on 1 kW Wind Turbine Blade using 3 mm Balls

Santosh R Sandanshiv, Umesh S Chavan



Abstract: Particle damping technique is first time use for study of vibration suppression in 1 kW wind turbine blade for using change of percentage fill of particles parameter. External container is attached on blade and fills the container using three different percentage changes as 10, 50 and 90 using 3mm spherical ball size. Blade is mounted at root location on electromagnetic shaker and accelerometer is located randomly on blade at 600 mm position from tip of blade. With damping results are compared with without damping and finding out the cases where vibration suppression takes place.

Keywords : wind turbine blade, particle damping, vibration, suppression

I. INTRODUCTION

To fulfil the growing needs of electricity required to increase the capacity of wind turbine blades bring us to think about increase in size of rotor [1] and naturally makes the thickness of blade becomes thin. As flexibility is inversely proportional to stiffness so, decrease the stiffness of blade [2] introduces vibration effects. In wind energy power generation if vibrations of blade is high then it adversely affect on electricity generation [3-4]. For investigating vibrations many scientists works on finding dynamic characteristics using the blade element momentum method (BEM) technique [5,12]. Typhoon wind creates turbulence effect which was investigated [6]. Saranyasontorn [7] studied the different methods of investigation of extreme wind turbine loads. Due to extreme loading conditions different parts like blades, nacelle cover was damage [8-9]. Structural vibrations can be control by using three different techniques namely active, semi active and passive control [4].

In wind energy power generation, if vibrations of blade is high then it adversely affect on electricity generation [10]. In this paper particle damping technique is used to check the effect of different parameters on 1 kw wind turbine blade for vibration suppression. Two parameters are used such as change in position and change in percentage fill keeping 3 mm ball size as constant. At this moment it is not possible to make pocket inside the blade for inserting balls, but for checking the effect we attach external container on blade.

The study contains particle damping method, testing with variable parameters, results, discussion and conclusion.

II. PARTICLE DAMPING METHOD

Keeping both materials of particles are same. Fig. 1 shows particle-particle impact parameters. Where K_N, K_S, C_S and C_N are stiffness and damping constant at particle wall.

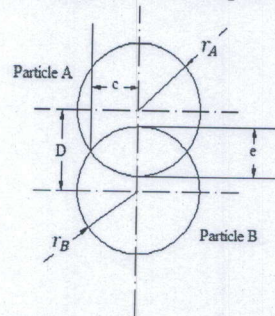


Fig. 1. Particle – Particle impact parameters

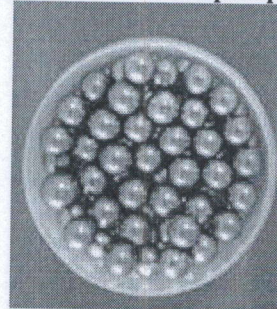


Fig.2. Container with Particle damper

Fig.2. shows spherical particles. The use of particle damping method is based on simulation ability of contact interactions using a small number of parameters that capture the most important contact properties. Forces between individual particles and the cavity walls are calculated based on force-displacement relations. Forces created due to particle-particle and particle-cavity impacts is the critical aspect for mathematical model. Let, A and B becomes two spherical particles with radii r_A and r_B with particle centers separated by a distance D . These two particles interact if their approach e is positive. The approach can be defined as

$$e = (r_A + r_B) - D$$

Contact forces

$$\vec{f} = f^n \cdot \vec{N}^n + f^s \cdot \vec{N}^s$$

Where, f^n = Normal force, f^s = Shear force, \vec{N}^n = Unit vector in normal direction and \vec{N}^s = unit vector in shear direction.

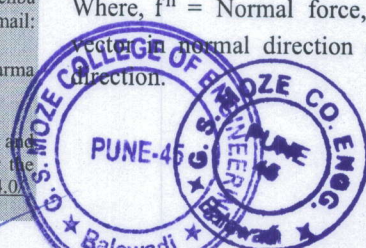
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Stabilization of Black Cotton Soil by Using Construction and Demolition Waste

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Abstract

Black cotton (BC) soil that change significantly in volume with change in water content is the major cause of distortions to structures in India since, it covers around 20% of land area. Over the years successful methods have been used to stabilize them. However, it is found very important for engineers to judge the effectiveness and appropriateness of all stabilizers. Black cotton soil constitutes of a too easy phyllosilicate collection of minerals that procedure when they involve from water solution as microscopic minerals known as Montmorillonite. Clay mineral that have susceptibility to change volume with application of moisture into it which in turn create various problems during construction on site due to swelling and shrinkage behavior. The expansive soils encounters swelling and shrinkage during different wet and dry seasons causing considerable damage to structures. The problems caused by expansive soil to the stability of civil engineering structures have received universal attention in view of serious economic loss at national level of many nations. Now a day's construction industry is increasing rapidly in India due to improving economic growth; and large amount of waste being generated. In this research we have studied various soil parameters with respect to conventional soil (sample procured from field) and stabilized soil (by adding increasing percentages of construction and demolition waste) and the C&D waste percentages are added as 3%, 6% and 9% the CBR values are increased considerably.

Keywords: CBR, pavement, black cotton soil, demolition waste

INTRODUCTION

Long term durability of pavement structures depend on the stability of the soils beneath. Earth materials below pavement do not always meet these requirements. So there is a need to change these less effective earth materials into sustainable sub grade materials. Stabilizing the poor soil such as black cotton soil with acceptable waste material as stabilizer could be an effective economic method. The

quantity of waste materials generated per annum from construction and demolition activities ranges from 0.27 to 5.18 million tons. Due to the rapid growth in the construction industry, it will be suitable to link construction and demolition waste generation with the Indian economic development. Therefore, appropriate practices are necessary to control construction and demolition (C&D) waste in order to propose an economic approach.





International Conference on Pervasive Computing Advances and Applications – PerCAA 2019

Pollutant Gases Detection using the Machine learning on Benchmark Research Datasets

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Abstract

In real time environment, different varieties of sensor devices are deployed to collect and transmit the periodic environment data to the base station to monitor the specific tasks. The pollutant gases like methanol, LPG, ammonia are harmful to human beings, hence such vulnerabilities should automatically be detected and safety alarm generated in a particular area. Such systems are often called as Electronic Nose (E-nose) systems which are an automated system that analyze continues periodic data and detect any harmful situations based on various approaches such as threshold-based or machine learning based. In this Paper, we have evaluated the performance metrics Sensitivity, Specificity, and Accuracy for GSAD dataset and Air Quality datasets.

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Keywords: E-nose, artificial neural networks, pollutant gases, methanol, sensor, machine learning

1. Introduction

In the recent paradigm the prediction methods, Machine Learning is used worldwide in real time applications. Machine Learning is mature and well-recognized research and mainly concerned with the discovery of models, patterns, and other regularities in data. The essential supposition of these strategies is that all points are situated in a low-dimensional complex and the chart is utilized for presume of the causal complex. Neighbouring point sets associated with vast weight edges have a tendency to have similar marks and the other way around. Along these lines, the names related to data can be proliferated all through data mining.

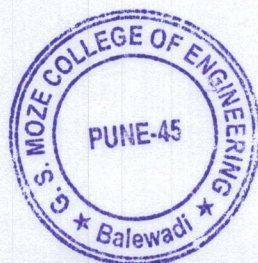
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A Smart Wearable Device for Stuttering Detection and Intervention using IoT and Machine Learning Technologies

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Prof. Kopal Gangrade⁴

^{1,2,3,4}Genba sopanrao Moze College of Engineering Pune

ABSTRACT

This research paper presents the development and evaluation of an IoT-based wearable assistive device designed for stuttering monitoring and feedback, integrating machine learning algorithms for enhanced accuracy and real-time functionality. The device incorporates a variety of hardware and software components, including sensors, microcontroller units, and communication protocols, to capture speech patterns and movement accurately. Machine learning algorithms, such as Support Vector Machines (SVM) and Convolutional Neural Networks (CNN), are employed for real-time analysis of speech patterns and detection of stuttering episodes. The selection criteria for machine learning models, training and testing procedures, and performance evaluation metrics are discussed in detail. The wearable device prototype underwent rigorous testing and validation, demonstrating high accuracy, sensitivity, and specificity in distinguishing between stuttered and fluent speech patterns. User feedback and usability evaluations highlighted the device's ergonomic design, intuitive interface, and real-time feedback capabilities, positioning it as a promising tool for improving stuttering therapy outcomes. Comparative analysis with existing solutions further underscored the device's superior performance and potential for clinical adoption. The implications of the findings for stuttering therapy, limitations, future work, and potential for clinical adoption are discussed, emphasizing the device's contributions to personalized and effective interventions in stuttering therapy. Overall, this research contributes to the advancement of assistive technologies in speech therapy and highlights the potential of IoT-based wearable devices integrated with machine learning algorithms for improving the quality of life for individuals with stuttering disorders.

Keywords: Wearable IoT, Stuttering Feedback, ML Algorithms, Real-time Analysis, Speech Therapy.

INTRODUCTION

Stuttering is a speech disorder characterized by disruptions in the fluency of speech, often manifesting as repetitions, prolongations, or blocks of sounds or syllables. It affects individuals of all ages and can have significant social and psychological impacts. While traditional therapy approaches have shown some effectiveness in managing stuttering, there is a growing need for innovative assistive devices to enhance therapy outcomes.

Assistive devices play a crucial role in stuttering therapy by providing real-time feedback and support to individuals during speech practice sessions. In recent years, there has been a surge of interest in developing IoT-based wearable devices to monitor and assist individuals with various health conditions, including speech disorders like stuttering.

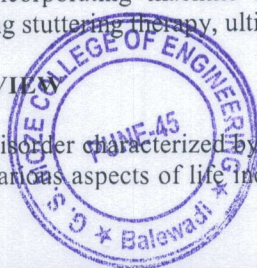
These wearable devices leverage the power of the Internet of Things (IoT) to collect and transmit data from sensors embedded in the device to a central processing unit. This real-time data collection enables continuous monitoring of speech patterns, which can aid in the assessment and management of stuttering.

Furthermore, the integration of machine learning algorithms into these wearable devices holds great promise for enhancing stuttering monitoring and therapy. Machine learning algorithms can analyze speech patterns and provide personalized feedback to individuals, facilitating targeted therapy interventions.

This paper explores the design and development of an IoT-based wearable assistive device for stuttering monitoring and feedback. By incorporating machine learning algorithms, the device aims to provide real-time support to individuals undergoing stuttering therapy, ultimately improving therapy outcomes and enhancing quality of life.

LITERATURE REVIEW

Stuttering, a speech disorder characterized by interruptions in the flow of speech, poses significant challenges for those affected, impacting various aspects of life including communication, social interaction, and employment opportunities.



A Smart Wearable Device for Stuttering Detection and Intervention using IoT and Machine Learning Technologies

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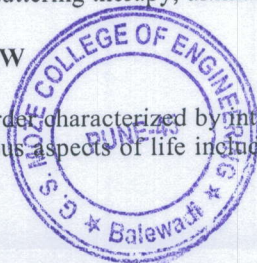
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A Smart Wearable Device for Stuttering Detection and Intervention using IoT and Machine Learning Technologies

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Prof. Kopal Gangrade⁴

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ABSTRACT

This research paper presents the development and evaluation of an IoT-based wearable assistive device designed for stuttering monitoring and feedback, integrating machine learning algorithms for enhanced accuracy and real-time functionality. The device incorporates a variety of hardware and software components, including sensors, microcontroller units, and communication protocols, to capture speech patterns and movement accurately. Machine learning algorithms, such as Support Vector Machines (SVM) and Convolutional Neural Networks (CNN), are employed for real-time analysis of speech patterns and detection of stuttering episodes. The selection criteria for machine learning models, training and testing procedures, and performance evaluation metrics are discussed in detail. The wearable device prototype underwent rigorous testing and validation, demonstrating high accuracy, sensitivity, and specificity in distinguishing between stuttered and fluent speech patterns. User feedback and usability evaluations highlighted the device's ergonomic design, intuitive interface, and real-time feedback capabilities, positioning it as a promising tool for improving stuttering therapy outcomes. Comparative analysis with existing solutions further underscored the device's superior performance and potential for clinical adoption. The implications of the findings for stuttering therapy, limitations, future work, and potential for clinical adoption are discussed, emphasizing the device's contributions to personalized and effective interventions in stuttering therapy. Overall, this research contributes to the advancement of assistive technologies in speech therapy and highlights the potential of IoT-based wearable devices integrated with machine learning algorithms for improving the quality of life for individuals with stuttering disorders.

Keywords: Wearable IoT, Stuttering Feedback, ML Algorithms, Real-time Analysis, Speech Therapy.

INTRODUCTION

Stuttering is a speech disorder characterized by disruptions in the fluency of speech, often manifesting as repetitions, prolongations, or blocks of sounds or syllables. It affects individuals of all ages and can have significant social and psychological impacts. While traditional therapy approaches have shown some effectiveness in managing stuttering, there is a growing need for innovative assistive devices to enhance therapy outcomes.

Assistive devices play a crucial role in stuttering therapy by providing real-time feedback and support to individuals during speech practice sessions. In recent years, there has been a surge of interest in developing IoT-based wearable devices to monitor and assist individuals with various health conditions, including speech disorders like stuttering.

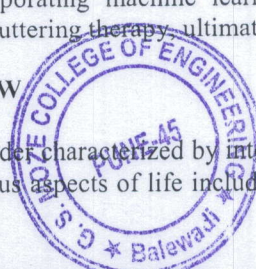
These wearable devices leverage the power of the Internet of Things (IoT) to collect and transmit data from sensors embedded in the device to a central processing unit. This real-time data collection enables continuous monitoring of speech patterns, which can aid in the assessment and management of stuttering.

Furthermore, the integration of machine learning algorithms into these wearable devices holds great promise for enhancing stuttering monitoring and therapy. Machine learning algorithms can analyze speech patterns and provide personalized feedback to individuals, facilitating targeted therapy interventions.

This paper explores the design and development of an IoT-based wearable assistive device for stuttering monitoring and feedback. By incorporating machine learning algorithms, the device aims to provide real-time support to individuals undergoing stuttering therapy, ultimately improving therapy outcomes and enhancing quality of life.

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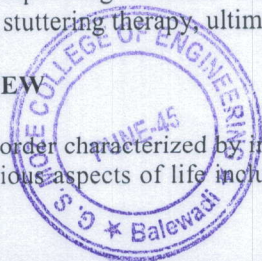
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Edge Computing and IoT

Edge computing, defined as processing data near the source rather than relying on centralized cloud systems, has emerged as a critical paradigm in managing the deluge of data generated by IoT devices. Satyanarayanan (2001) laid the groundwork by highlighting the challenges and vision of pervasive computing, emphasizing the need for localized data processing.

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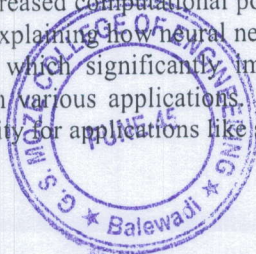
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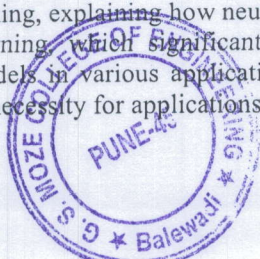
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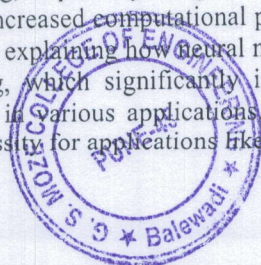
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Utilizing IoT Data Streams for Continuous Monitoring and Machine Learning Analysis of Stuttering Patterns

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Article history: Received: 17 April 2019, Accepted: 14 May 2019, Published online: 5 June 2019

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Keywords: Stuttering, Speech Disorders, Internet of Things, IoT Data Streams, Continuous Monitoring, Machine Learning, Deep Learning, Real-time Analysis, Personalized Intervention, Treatment Strategies.

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IoT in Continuous Monitoring

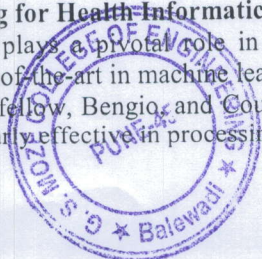
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Zhang and Zhang (2013) examined real-time data acquisition in IoT systems, demonstrating the importance of efficient data processing methods for handling the large volumes of data generated by IoT devices. Perera et al. (2014) discussed context-aware computing within IoT, which involves collecting and analyzing data streams in real-time to provide actionable insights. These capabilities are vital for monitoring stuttering patterns, where continuous data collection is necessary for accurate analysis.

Machine Learning for Health Informatics

Machine learning plays a pivotal role in extracting meaningful patterns from IoT data streams. Holzinger (2013) reviewed the state-of-the-art in machine learning for health informatics, identifying the challenges and future directions in this field. Goodfellow, Bengio, and Courville (2016) provided an in-depth exploration of deep learning techniques, which are particularly effective in processing complex data such as speech patterns.



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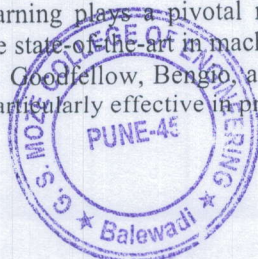
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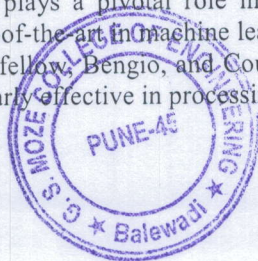
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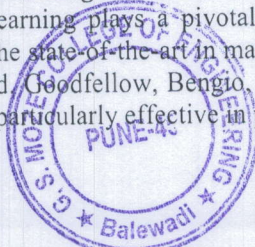
The potential of IoT for continuous monitoring has been extensively explored, highlighting its applications across various domains. Biswas and Giaffreda (2014) discussed the convergence of IoT and cloud computing, emphasizing the opportunities and challenges that arise in this integration, such as data management and security concerns. Atzori, Iera, and Morabito (2010) provided a comprehensive survey on IoT, detailing its architectural elements and future directions. They underscored the importance of real-time data acquisition and processing capabilities in IoT, which are crucial for applications in healthcare monitoring.

IoT and Data Streams

Zhang and Zhang (2013) examined real-time data acquisition in IoT systems, demonstrating the importance of efficient data processing methods for handling the large volumes of data generated by IoT devices. Perera et al. (2014) discussed context-aware computing within IoT, which involves collecting and analyzing data streams in real-time to provide actionable insights. These capabilities are vital for monitoring stuttering patterns, where continuous data collection is necessary for accurate analysis.

Machine Learning for Health Informatics

Machine learning plays a pivotal role in extracting meaningful patterns from IoT data streams. Holzinger (2013) reviewed the state-of-the-art in machine learning for health informatics, identifying the challenges and future directions in this field. Goodfellow, Bengio, and Courville (2016) provided an in-depth exploration of deep learning techniques, which are particularly effective in processing complex data such as speech patterns.



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Design and Implementation of an IoT-Integrated Machine Learning Platform for Remote Stuttering Therapy and Assessment

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ABSTRACT

This paper explores the development of an advanced platform aimed at transforming remote stuttering therapy and assessment. Stuttering, a prevalent speech disorder impacting millions worldwide, presents unique challenges requiring specialized interventions. However, traditional therapy methods often encounter obstacles like geographical limitations and resource scarcity, necessitating innovative solutions. Our research addresses these challenges by leveraging Internet of Things (IoT) technologies. We have devised a platform facilitating seamless connections between stuttering therapy seekers and therapists, irrespective of their locations. Through the integration of machine learning algorithms, our platform provides personalized therapy sessions and real-time analysis of stuttering patterns, ensuring customized interventions for each individual. We have prioritized user accessibility by designing a user-friendly interface for therapists and clients, alongside robust security measures to safeguard patient data. Key features include an intuitive interface for therapy sessions, advanced speech analysis algorithms for real-time assessment, and secure cloud-based data storage. Furthermore, our platform incorporates adaptive learning mechanisms to continually refine therapy outcomes based on user feedback. The implementation of our IoT-integrated machine learning platform signifies a significant advancement in remote stuttering therapy and assessment, promising to enhance the lives and communication skills of stuttering individuals by overcoming geographical barriers and improving access to specialized services. This paper provides a comprehensive exploration of our research, encompassing its purpose, methodology, findings, significance, originality, and conclusions. Our aim is to illuminate the innovative contributions and practical implications of our work in the field of remote stuttering therapy and assessment.

Keywords: Stuttering therapy, Remote assessment, Internet of Things (IoT), Machine learning, Personalized interventions, User accessibility, Real-time analysis, Adaptive learning, Geographical barriers, specialized services.

LITERATURE REVIEW

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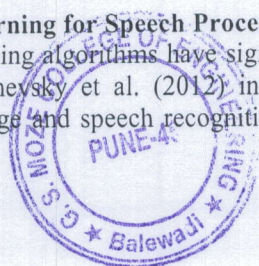
The integration of Internet of Things (IoT) with machine learning techniques for healthcare applications has been widely explored in recent years. This literature review examines key developments in sensor technology, speech processing, and machine learning that collectively underpin the proposed platform for remote stuttering therapy and assessment.

IoT and Sensor Technology in Healthcare

IoT has revolutionized healthcare by enabling continuous monitoring and data collection through wearable sensors. Chan et al. (2008) provide an extensive review of smart homes and the implementation of IoT in monitoring patient health and safety. Patel et al. (2012) further discuss the application of wearable sensors in rehabilitation, highlighting their potential for long-term monitoring of patients with chronic conditions. The flexibility and adaptability of IoT systems in personalized healthcare are crucial for developing a remote stuttering therapy platform. He et al. (2008) emphasize the importance of security and privacy in IoT networks, which is essential for protecting sensitive patient data.

Machine Learning for Speech Processing

Machine learning algorithms have significantly advanced speech processing capabilities, which are vital for stuttering therapy. Krizhevsky et al. (2012) introduced deep convolutional neural networks (CNNs) that have dramatically improved image and speech recognition performance. Zeiler and Fergus (2014) further explored the visualization of



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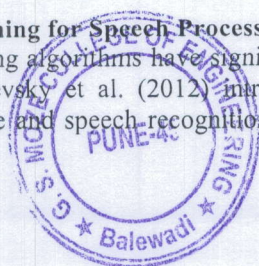
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