VISHWACON 2019

Presents

Proceedings of the

3rd NATIONAL CONFERENCE ON RECENT TRENDS IN ENGINEERING & TECHNOLOGY

VISHWACON' 2019

FEBRUARY 8th & 9th, 2019

Mrs. R.G.Purandare
CONVENER

Mrs. S.R.Rathi
CO-CONVENER

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Message From Director

Engineering and technology is a multidisciplinary field that demands development of new technologies and innovations in every sphere of industry. This ever growing demand for new concepts, design is derived from intensive efforts put in by scientists, academicians and technocrats all over the world for upliftment of the society.

This conference provides an opportunity to bring academicians, researchers and technocrats to present their research, projects, views, developed ideas as well as network for future works related to recent trends in Engineering and Technology.

It gives me immense pleasure to welcome you all to **VISHWACON 2019** a National conference on **"Recent Trends in Engineering and Technology"** on 8th -9th February, 2019. I am confident that the ideas presented in the conference and outcome of the conference will be a step ahead to make a mark in the technological advancement.

I extend my best wishes for the conference.

Dr. (Mrs.) B. S. Karkare
Director,
Vishwakarma Institute of Information Technology, Pune

From Convener's Desk

It is a matter of great pleasure for us to offer the third National Conference on "Recent Trends in Engineering & Technology" **VISHWACON 2019** and its proceedings to all of you.

It is with great pleasure that I serve as conference convener for **VISHWACON 2019** a multi-disciplinary second international conference organized by Vishwakarma Institute of Information Technology in association with Savitribai Phule Pune University. The conference aims at providing a forum for the students, working professionals, and scientists around the world to disseminate the knowledge and research in the contemporary issues in the field of engineering and applied sciences.

We sincerely hope that the conference will inspire the researches to pursue their work along these new avenues. We sincerely thank to national advisory committee members, authors, reviewers and all the members of the organizing committee for their cooperation and whole hearted support.

R.G. Purandare
Convener-VISHWACON

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Key Note Speaker

Mr. Amit S Deshpande is currently working as Director-Operations at Konecranes, Pune. A professional with 26 years of industry experience, he has graduated in Production Engineering from Amravati University. He has done executive MBA from Symbiosis University. He has worked with renowned companies such as Force Motors, Tata Motors , John Deere and Perkins CAT. He has 26 years of qualitative experience in Strategic & Tactical Planning, P&L, Factory Operations, Material Flow Management, Quality and Process Management. He has implemented Global sourcing programs for critical Engine and Cranes castings & forging components with Global Standards & Product Validation and Verification. He has travelled to various countries for benchmarking manufacturing processes.

Chief Guest

Madhukar Vishwanath Pitke, Ph.D., has contributed to the design and implementation of several telecommunications and computer based systems at the Tata Institute of Fundamental Research. As founder director of the Centre for Development of Telematics (CDOT), he guided development of technology for central offices that now form a significant part of the Indian network. With support from the DST, his team developed a large parallel processor for weather studies. The architecture centered around a rapidly reconfigurable interconnection network in an SAMD - Single Algorithm Multiple Data architecture. He served on the board of Meltron Semiconductors Ltd where he helped the company in power semiconductor and power electronics products for telecom and automobile industry.

He has been working with Universities, IITs and R&D institutions and has over 250 publications and presentations in leading scientific journals/conferences. With support of UN agencies he organized several international and regional workshops covering the latest developments in communication technology.

He was actively involved with IEEE ComSoc and MTTS activities in India .His current activities include the development of technologies for next generation networks, high performance computing, technology transfer, and education.Dr. Pitke is a Fellow of the IEEE (USA), the Indian Academy of Sciences, the Institution of Electronics and Telecommunication Engineers and member of the ACM. He was also a member of The New York Academy of Sciences and the Pacific Telecommunications Council.

Message from Head Computer Engineering

With great pleasure, we hereby present the new edition of Vishwacon-19, a national level conference and paper presentation competition, organised for students at VIIT, Pune. The main areas of research which are included this year are Internet of Things, Artificial Intelligence, Machine Learning, Data Science and Software Engineering. Cloud Computing, This conference is a great platform for young researchers to present and publish their ideas which can reform the industry to a great extent.The abstracts of the researches and surveys in this journal will prove to be helpful not only to the students but also to the professionals who wish to disseminate their knowledge in the field of Computer Engineering.

I would like to thank all the authors for their contributions in this journal. Also, I appreciate the hard work put in by all the members of the organising committee, reviewers and all the students who contributed in the publication of this issue. I hope you all find this edition helpful in your future endeavours. We are equally open to suggestions and comments.

Dr. S. R. Sakhare,
Head of Department.

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CE-01: Comparative Study of NLP based IR systems

Akash Joshi, BE-Computer, VIIT Pune
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Abstract- Information Retrieval (IR) is the process of finding relevant resources about a piece of information from a humongous collection of resources. Due to dominance of textual data over internet, primary task of any IR system is to process those text where NLP plays vital role to understand and generate languages that human use naturally. In NLP based Information Retrieval (IR) system retrieves information from documents according to user query. This paper compares various Natural Language Processing systems to retrieve information from textual input. The various systems are tested in real world scenarios and their performance is compared.

General Terms- Information Retrieval System (IRS), Natural Language Processing (NLP), Automated Speech Recognition (ASR).

Keywords- Textual questions, speech sentiment analysis, ASR, bot, agent, information extraction.

CE-02: Automatic Optical Character Recognition on Captioned Images

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Devika Verma, Assistant Professor, Computer Engineering, VIIT Pune

Abstract- Text extraction from images is an area where the development of a computer system having the ability of autonomously reading the text from images for a range of real-life applications is researched. Potentially, this is difficult due to the sheer variety in the type of texts available with distinct properties such as fonts, language, quality. Often these texts are a part of images(in the form of "captions") which are distributed among social media and are pivotal in providing contextual understanding to the information within them. Hence, extracting the same becomes vital for performing any kind of further research such as sentiment analysis or the broad prospects of natural language processing. In this work, we propose a novel approach for automatic Optical Character Recognition on captioned images using neural network architecture, which has proven to be among the front-runners in text and image-based classification problems in the near past. Our work consists of two parts 1) Pre-processing using gamma correction, binarization, and text region extraction using a segmentation algorithm 2) Using unique features for character classification with the help of artificial neural networks. We further also discuss the current methods that are used in analyzing the accuracy of the recognition process and the required post-processing that is needed to build a more prolific solution.

Key words- *Text Extraction, OCR, gamma, binarization*

CE-03: Study of Spine Pain Classification based on Physical Activities using Machine Learning

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S.G.Koshatwar, BE-Computer, VIIT Pune
S.T.Gophane, BE-Computer, VIIT Pune
Manisha Mali, Assistant Professor, Computer Engineering, VIIT Pune

Abstract – Advancements in technology has resulted in drastic change in lifestyle and has led to various medical problems. Back pain is one of the most frequent problem that occurs due to such change in lifestyle, bad posture habits and disability.

The Neuro – Spine Medical Data Analytics System(NSMDAS) is a system which would assist doctors and patients get effective analysis and deeper insights about the issues faced by the patients for back pain. NSMDAS will provide detailed analysis related to various problems occurring at different spinal regions and would also suggest remedies to temporarily overcome the pain in the affected regions. Two baseline machine learning classifiers namely Decision Tree and Naïve Bayes would be used for pain classification among various patients.

Keywords- *Machine Learning, Decision Tree, Naïve Bayes.*

CE-04: 3D Virtual Clothing Assist

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Nitish Mhaske, BE-Computer, VIIT Pune

***Abstract*—**Today, people are using online platforms that permits a customer to submit online orders for item and/or services from store. The system accepts customer submission of purchase order for item in response. Physical try-on of clothes is a time-consuming procedure in retail shopping. 3D Clothing Assist is a platform which provides an easy way to choose a variety of clothes which suits you and a virtual try that can help to speed-up the process. The customers can see the clothes on his body without wearing them and thus narrow down his/her selections before physical try-on. This system also recommends few suggestions that looks better on you. Furthermore, you may invite your friends to be a part of the system and suggest these clothes. However, current solution is not a best solution but compared to other it'll enhance the system and the customer interaction.

Keywords—*3D Clothing, virtual try-on*

CE-05: A Survey on Hand Gesture Recognition Techniques

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Vishwesh Chaudhari, BE-Computer, VIIT Pune
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***Abstract*—** Almost everyone uses a desktop or laptop these days. A serious problem is that we insist on using mouse, which are not viable in a long run. And in the VR / AR era, we can't use the mouse. To replace a mouse, we have to devise many subtle gestures and these gestures have to be easy one for people to learn easily. We need to make standard gestures that make people as easy to use as standard mouse. The use of such system can be done to reduce operational distance between humans and the devices facilitating operations from distance. This paper provides a study on various hand gesture recognition methods such as segmentation and other techniques used previously.

Keywords*—Hand Gesture Recognition; Segmentation; VR/AR.*

CE-06: CHATBOT FOR COLLEGE

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Ritu Punamiya, BE-Computer, VIIT Pune

***Abstract*—** Chatbots are programs that communicate through text with human using Artificial Intelligence(AI).It is used in many areas like entertainment,Business ,education.The machine has been made to identify the question and make response to answer the question.Chatbots are completely text based user interface [8].Chatbot has become more popular in business right now as they reduce service cost and handle multiple user at a time.In this paper we provide chatbot which provide efficient answer for any question using Artificial Intelligence(AI) and Latent Dirichilet Allocation(LDA).The user can ask question related college activities through the chatbot from anywhere .The system analyses the question and answers to the user .The user just has to register himself to the system .In chatbot Natural Language Processing (NLP)technologies are used for parsing, tokenizing, stemming and filtering the content of questions [8][7].

Keywords -*. NLP (Natural Language Processing), AI (Artificial Intelligence), LDA [8].*

CE-07: A Survey on Business Applications of Artificial Intelligence and Machine Learning

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Prathamesh Wali , TE Computer, VIIT Pune.
Nikhil Karve , TE Computer, VIIT Pune.
Mahima Chandan , TE Computer, VIIT Pune.

ABSTRACT: There are diverse applications for AI/ML technologies that you can implement to expand your business. With the help of AI and ML, your business will benefit as it becomes more appropriate at its operations and eliminates those tasks that seem to be slowing you down. From validating cross-layer resilience to automating the process of recruiting people, from cyber security defense to predicting market ups and downs, from becoming more customer centric to understanding behaviors, AI /ML is always a boon. AI-powered tools and automated systems mostly help your company improve the use of its resources, with visible effects. Analysis of all the applications and also where and when AI/ML can come into existence to make it helpful is mentioned in the paper. In summary, this paper discusses key business applications of artificial intelligence and machine learning which are crucial for enhancing the business.

KEYWORDS: *Artificial Intelligence, Neural networks, cross resilience, automation, vulnerability*

CE-08: Detection of Diabetic Retinopathy Using Deep Neural Networks

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Pranav Bahulekar, TE Computer, VIIT Pune
Pranav Acharekar, TE Computer, VIIT Pune

Abstract— Autoimmune diseases are the kind of diseases in which immune system mistakenly attacks human body instead of foreign agents. Early detection of these diseases is difficult because they can be easily misdiagnosed as other common ailments. Due to this, they are diagnosed at critical stage where most often treatment doesnt work. The solution is to come up with techniques for early detection so that proper treatment can avoid manifestation of mild symptoms into chronic disease. This paper focuses on Diabetic Retinopathy and proposes few techniques to automate its detection with highest accuracy. Objective is to detect the presence, type and level of severity using Convolutional Neural Network. Retinal Fundus image dataset available on Kaggle which is authentic and universal will be used.

We are going to experiment by building an ensemble of CNNs where each CNN will be given preprocessed images using different preprocessing techniques.

Keywords: auto immune, diabetic retinopathy, convolutional neural networks, neural network

CE-09: YouTube Data Analysis

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Kaustubh Kolhe, BE- Computer, VIIT Pune
Lokesh Khairnar, BE- Computer, VIIT Pune
Ashish Bhagat, BE- Computer, VIIT Pune

Abstract: YouTube is one of the most popular social networking sites which have millions of users posting and viewing different kinds of videos. 300 hours of video is uploaded to YouTube every minute. Over 5 billion videos are viewed in a day. Approximately 7.2 Gigabyte (GB) of data is uploaded to YouTube every minute. Having different channels posting different categories of videos regularly and users from different parts of the globe giving feedback on these videos, YouTube is one of the best source of big data. Previous analysis on YouTube data are dealing with users' sentimental analysis related to different issues. This paper mainly concentrates on analysing YouTube trending video metadata. It deals with analysing YouTube data based on various machine learning techniques. Results are analysed visually by using tools like Rapid miner and Tableau.

Keywords —Data Analysis, Data visualization, Machine Learning Techniques.

CE-10: Survey of Heart Failure Prediction Techniques

Shweta Tiwaskar, Assistant Professor, Computer Engineering, VIIT Pune
Vinita Jain, BE-Computer, VIIT Pune
Sayli Kamthe, BE-Computer, VIIT Pune
Sanyukta Jawale, BE-Computer, VIIT Pune
Ashita Agarwal, BE-Computer, VIIT Pune

Abstract - Heart failure is quite rampant in many parts of the world and its accurate prediction and detection is of major concern. Even though in the past couple of years the death rate due to heart failure has declined in some parts of the world but in India it continues to rise. A study shows that in India death due to Heart Failure rose by 34% in the past 6 years. It is considered as one of the deadliest human disease and an accurate early prediction of Heart Failure will be vital for its prevention,treatment and patient safety. While on the other hand, diagnosis of HF in a late stage severely limits the therapeutic benefits of interventions and the prospect of survival. More patients die from heart failure in low and middle income category as the rich can afford an expensive treatment. Hence the earlier we can predict the heart failure possibility the more helpful it will be for the patients to overcome it ,also it will be helpful for the doctors to prescribe proper medication ,diet modifications and recommend lifestyle. Majority of study carried out on this topic focus on binary classification. This paper analyses different techniques used for heart failure prediction and propose a framework for multi level classification of heart failure.The proposed framework compares the performance of back propagation neural network and decision tree to predict the heart failure risk .The model predicts the presence and severity(low risk, medium risk and high risk) of heart failure.

Key words-Heart Failure, severity level , risk assessment,neural network, decision tree

CE-11: Disease detection in leaves using Machine Learning and Image Processing Techniques

Abhijith S Nair, BE-Computer Engineering, VIIT Pune
Harish Alhate, BE-Computer Engineering, VIIT Pune
Vaibhav Jawale, BE-Computer Engineering, VIIT Pune
Rahul Kumar Das, BE-Computer Engineering, VIIT Pune
Disha Wankhede, Assistant Professor, Computer Engineering, VIIT Pune

Abstract- Nowadays farmers are facing serious crop issues which include various kinds of diseases especially found in leaves. Introducing new technologies in agriculture offers a wide range of techniques such as precision and sustainable agriculture in the field. Sensors help in collecting information about conditions like weather, moisture, temperature, and fertility of the soil. Artificial Neural Networks (ANN) are trained using Machine Learning Algorithms and are used for monitoring the farm conditions and microcontrollers are used to control and automate the farm processes. In this paper, we are proposing a model to remotely view the conditions of the farm and also to detect the diseases in leaves if found any. Cameras have been mounted on an Automated Guided Vehicle (AGV) which will continuously roam around the field capturing images of the leaves. These images will be given as an input to an ANN for the prediction of diseases (if any). Results of these predictions will be forwarded to the user's smartphone. This method will make the farmer remain updated with the on-going conditions of his field at any time and any part of the world.

Key words- Image Processing, Image Classification, Deep Learning, TensorFlow

CE-12: Smart Assistance for Visually Impaired People

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Achyut Ratkanthiwar, BE-Computer, VIIT Pune
Samruddhi Wani, BE-Computer, VIIT Pune

Abstract- Safe mobility is among the greatest challenges faced by the visually challenged in day to day life. They use the white cane as a mobility aid to detect close-by obstacles on the ground. This project is concerned with creating a module which will aid and assist visually impaired people in their daily routine. It will be a hand held smart device to identify obstacles and give an audio information about the surrounding. This device will be able to detect nearby objects, recognize them and give a responsive output to the user in audio format. The device will be a module which can be mounted on their white cane or can be attached to their shirt or jacket. We are expecting an easy to use and easy to handle device for visually impaired people.We are creating a camera module which will identify and give a relationship between the objects in-front of it. Camera module is being trained using faster RCNN machine learning algorithm. We are also working on a hardware module with different sensors to detect any object, its position and distance from the user. Camera module will describe the actual scene around the user. Whenever a user is walking, if an obstacle or any object comes in his/her way and the distance between the object and the user is below the minimum threshold value, the module will give a warning message or signal to the user in the form of audio. While the camera can brief him/her about the surrounding whenever required.

Keywords-Smart Assistance, Camera, Lidar, Obstacle detection

CE-13: GPS ASSISTED LOCATION BASED SERVICES FOR SMART CITY WITH CLOUD INTEGRATION

Prathamesh Jinralkar, BE-Computer, VIIT Pune
Komal Chaudhari, BE-Computer, VIIT Pune
Balika Aher, BE-Computer, VIIT Pune
Samrin Bagwan, BE-Computer, VIIT Pune

***Abstract*—**In this paper we propose a goal-oriented application for Traffic Violations for smart city, providing cloud integration with easy access. With the traffic rules becoming more strict by the day it is of utmost importance that traffic surveyors i.e the Traffic Police Officials get an easy access to crime repository and noting down the crime of the individual committing a felony. The Application contains diverse variables including Police/Web User, Place, the type of crime committed, Reports along with the Profile Setting of the particular individual, Notifications for the crimes committed. Each of these variables have sub-variables which contains the necessary information that needs to be filled according to the necessary requirements. This application will help the Traffic Officials to coordinate and maintain traffic regulation. We are also using GPS Assistance to maintain a track of places where the most crimes are committed and what are the types of crimes that are committed the most.Cloud Integration helps in maintaining huge amounts of data and also at the same time making it easily accessible to all the Traffic Officials.

***Keywords*:** *Cloud integration, GPS.*

CE-14: Content Curation Engine for YouTube Learning Analytics

Anvay Mandar Joshi, *BE-Computer, VIIT Pune*
Vishal Kumar Jaiswal, *BE-Computer, VIIT Pune*
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***Abstract*-** Videos are one of the main components of Web 2.0. Videos are depiction of information in a graphical format. YouTube is one of the main platforms on which videos are viewed on Web 2.0. People share their experiences, knowledge and views with the help of such sites. However, it is not easy to fetch valuable information from the various videos in available time, which normally is very short. In this paper, a new approach of ranking the videos on YouTube based on various factors like user interest, views, likes/dislikes, comments etc is introduced. This new method of content curation will improve the knowledge experience of the user. The purpose of this paper or our project is to help students like us who need to get the knowledge from the social media platforms like YouTube to get required data swiftly. Today the problem is that large amount of information is available on the web, but getting right information is difficult. In our case of videos, while getting required content on a video much of the time gets wasted. With our system, what we want is with the help of certain features of a video which are mentioned above, we are aiming to design a system which will provide user top ranked videos of a specified query.

***Keywords*-**YouTube, likes, dislikes, comments

CE-15: Parking and Security Management in an Educational Hub

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Abstract: At the present time there are many colleges in an educational institute. Also, the number of students and staff is increasing abundantly and accommodating the parking slot for them has become a tedious task. In current scenario the method of finding parking slot is manual in which driver manually searches for a vacant slot and parks. Due to improper management of parking, people face many issues in their day-to-day routine. Finding a vacant parking space consumes a lot of time and effort. It also consumes fuel which indirectly harms our environment. Also, on occasions like Annual gathering, parents meet or any other occasions where the crowd is in huge density it is almost impossible to search for a parking slot manually. Another concern is anyone can enter the college premises even if the person doesn't belong to the college. It increases the risk of misconduct or wrongdoings in the college premises. To overcome the disadvantages of this system mentioned, we are introducing PARKING AND SECURITY MANAGEMENT IN AN EDUCATIONAL HUB. In this proposed system users will be allotted parking slots dynamically. This system runs on mobile application and notifies the user about the parking area on a prior basis and the action will be reflected in the database. The system uses image processing using OCR and QLD as this will overcome the noise and also work in conditions where the number plate is not perspicuously visible. Thus, this will help to reduce the time invested to search for a parking slot and will also help to reduce the consumption of fuel. Admin will also keep a record of people entering the college this will help to discover illicit people.

Keywords- OCR, QLD, Data analysis, Image Processing, RFID, Data mining

CE-16: A Survey Paper On Question Pair Similarity and Text Summarization

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Abstract: With the proliferation of internet-based data, the information sought by relevant researchers can overlap over multiple data sources. To avoid this redundancy and to make the process of researching easier, platforms which render similar question grouping and assist in abstracting the data into short summaries are highly useful. The summarization process is automatized and performed using a combination of Deep Learning techniques, viz., Sequence-to-sequence model, Pointer Generator network, etc.

Keywords: sequence-to-sequence attentional distribution, TF-IDF, context vector, RNNs, POS-tagging

CE-17: Bluetooth Low Energy(BLE) and its applications in Location Tracking: A Survey

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Abstract- As avid trekkers, we often found difficulty in contacting other members of our trek group who had either gone ahead too quickly or who had straggled and got left behind- in the lush green mountains, mobile connectivity is almost completely absent, and we often ended up wasting a lot of time trying to make sure our friends and family stick together. This problem may arise not only for groups traveling in regions with low cellular connectivity, but also in cases where not everybody could be contacted using a cell-phone, for instance school children on excursion in an unfamiliar environment with their teachers, or to groups who enjoy attending music festivals together, where the network congestion may be very high, preventing you from contacting near and dear ones, and so on. In such situations, keeping track of all the members of the group travelling together is a
tedious task for the coordinators, and in the unfortunate scenario where somebody drifts away from the group, it is a daunting task to try to find them. While current systems exist that can track the location of moving objects in an indoor environment using Bluetooth Low Energy (BLE), we want to use these systems as a base to explore the possibility of designing such a system that could be used, primarily, in outdoor environments.

Keywords- BLE, Packet, Beacon.

CE-18: Personalized Food Delivery Application.

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Abstract –With the expansion in personalization in pretty much every administration, it has turned out to be critical that the administrations that individuals use once a day additionally give a customized feel. As per the ongoing pattern saw in the nourishment requesting and conveyance administrations, it was discovered that the sustenance conveyance applications like Zomato, FoodPanda, Swiggy and so forth have helped their deals by an extensive scales by presenting energizing offers and promotion codes and effectively pulled in an immense number of gathering of people and they have influenced their clients to motivate dependent on utilizing their application. This has prompted an expansion in the utilization of lodging nourishment which isn't solid whenever devoured every day. In this way, there is a requirement for an application which can convey quality home prepared sustenance. Accordingly, so as to fulfill this new need, we have proposed a framework that would simply convey quality nourishment as well as would keep a beware of the client everyday utilization and satisfy the client's dietary necessity by recommending what the client ought to eat.

CE-19: Statistical Analysis on Twitter Spam Detection

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Abstract-The spreading and learning of new discoveries and information is made available using current online social networks. In Recent days, the solutions may be irrelevant to the actual content; also termed as attacks in the layman's term such attacks are been performed on Twitter as well and called as Twitter spammers. The quality of data is being compromised by addition of malicious and harmful information using URL, bio, emoticons, audio, images/videos & hash-tags through different accounts by exchanging tweets, personal messages (Direct Message's) & re-tweets. Misleading sites may be linked with the malicious links which may affect adverse effects on the user and also interfere in their decision making processes. To improve user-experience from the spammers attacks, the training twitter dataset are applied and then by extracting and using the 12 lightweight features like user's age, number of followers, count of tweets and re-tweets, etc. are used to distinguish the spam from non-spam. For enhancing the performance, the discretization of the function is important for transmission of spam detection between tweets. Our system creates classification model for Spam detection which includes binary classification and automatic learning algorithms viz. Naïve Bayes classifier or Support Vector Machine (SVM) classifier which understands the behavior of the model. The system will categorize the tweets from datasets into spam and non-spam classes and provide the user's feed with only the relevant information. The system will report the impact of data-related factors such as relationship between spam and non-spam tweets, size of training dataset, data sampling and detection performance. The proposed system's function is detection and analysis of the simple and variable twitter spam over time. The spam detection is a major challenge for the system and shortens the gap between performance appraisals and focuses primarily on data, features and patterns to identify real user and informing it about the spam tweets along with the performance statistics. The work is to detect spammed tweets in real time, since the new tweets may show patterns and this will help for training and updating dataset and in knowledge base.

Keywords- *Twitter, Spam Detection, Machine Learning, Real-time application, Scalability.*

CE-20: Smart Maintenance of Grain Warehouse.

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Abstract—This project is an initiative to provide wireless network access to the temperature and moisture sensors. It will be helpful for food industry to preserve their goods at proper atmospheric condition. It involves use of temperature and moisture sensors along with Arduino. Using Wi-Fi module sensor data will be sent to user on mobile or computer device. The project aims at simplifying maintenance procedure and increase accuracy.

Keywords—DHT11(Temperature and Humidity sensor), Arduino, ESP Module, Remote access

CE-21: MULTI-DOMAIN QUESTION ANSWERING SYSTEM

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Abstract – Over the years there has been a lot of development in the discipline of information retrieval. Especially tools like search engines and chatbots have been some of the most remarkable inventions in the information age. Albeit, both of these come with their downsides. Conventional search engines, although being very generic in their working, tend to be quite tedious in answering the queries and cannot answer the questions precisely. On the other hand, chatbots, using NLP, can answer precisely the questions of the domain they're trained for, but they are very limited in the scope and domain. In this paper, we propose a novel solution which overcomes both of these drawbacks, a multi-domain question answering system. The proposed solution uses DMN to answer the questions which is trained initially on SQuAD dataset.
Keywords – *NLP (Natural language processing), DMN (Dynamic memory networks), ML (Machine Learning), SQuAD (Stanford QUestion Answering Dataset), URL (Uniform Resource Locator)*

CE-22: Multipath Routing and Emergency Service

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Abstract- Traveling is one of the unavoidable activity in today's busy schedule. But many times it wastes time due to heavy traffic, number of signals so, there is need of application which will provide optimal path by considering all these effective parameters. Today's Google Map provide shortest path on the basis of distance only. So we required Map which provide path on the basis of different parameter like fuel efficiency, number of signals. Our aim is to build Multipath Routing and Emergency Service Android Application which will provide optimal path to user by considering effective parameters like number of signals, fuel efficiency and also provide ambulance emergency service to user. Now a day there are some existing ambulance services Android App available. These App also have remarkable capabilities but the problem is that these App instead of taking user details automatically from stored database and location using GPS location they may request data from user manually which cannot be right every time and these existing systems also not provide live tracking of ambulance, shortest route based on fuel efficiency which is most important.

Key words: *GPS*

CE-23: IOT BASED VEHICLE SAFETY SYSTEM

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Abstract- The recent development in the domain of Internet of Things (IOT) and Smart Things provides many opportunities in the development of the automotive industry. This paper describes Vehicle Detection and Alert System, in short it describes Vehicle Safety System as a single system for the vehicles on the road using Internet of Things. Existing system for the transportation only has road sign indications at accidental spots which the driver might not notice during driving, such as turns where the chances of occurring of accidents is maximum or blind spots. There are many challenges we have to face while driving through a mountain pass such as controlling vehicle speed, blind spot, etc. There are facilities to inform after accident have occurred, but the aim is to develop a system in which it can reduce the chances of accidents in mountain pass. The system aims to inform the driver that the vehicle is coming from the opposite side of the turning point or blind spot in the mountain pass. This information will be given to driver enough distance before so that he can control the speed of the vehicle. In this way the system aims to overcome these short-comings by a dedicated system which provides audible and visual alert about vehicles moving on road. Driver will be able to understand the conditions which driver might have to face while driving the vehicle.

Key words- *IOT, Raspberry pi, Infrared sensor.*

CE-24: A Comparative Study of POS Taggers for Hindi language

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Abstract- Part of Speech(POS) plays a central role in many Natural Language Processing(NLP) tasks as it helps identify the positioning of words in a sentence. POS tagging is the process of parsing sentences with their respective Parts of Speech. These POS tagged words can then be used in applications such as Named Entity recognition(NER), Question Answering(QA), Coreference Resolution and Sentiment Analysis.The POS taggers openly available for Hindi language have their accuracies calculated against different test data. This paper provides an extensive comparison of POS taggers, mainly NLTK and RDR, on the same test data for accurate comparison.

Key words- *NLP-Natural Language Processing, POS-Part Of Speech, NLTK-Natural Language Toolkit, RDR-Ripple Down Rule Based, HMM-Hidden Markov Model, CRF-Conditional Random Fields*

CE-25: Traffic Violation Detection System Using Machine Learning

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Abstract- The Traffic Violation Detection system would detect road traffic violators automatically by using Tensorflow's object detection API, without any sort of human intervention by using CCTV footage and deep learning. It would also track and monitor vehicles, by using the above mentioned techniques. The system would help in increasing road safety for the citizens as well as decrease vehicular thefts / criminal activities as it would be constantly tracking all the vehicles at every location at every time. Currently, all traffic violations are detected by policemen manually which happens to be very inefficient and misses majority of violation cases. Violations viz. Not wearing helmets may seem insignificant but is very much essential for the road safety of vehicle riders. Vehicle monitoring of certain people(eg. Anti-social elements) is very difficult in current scenario of cameras and requires lot of man-hours to track such vehicles (going through hours of CCTV footage takes tremendous amount of time). Current camera system is not used to its full potential to solve cases such as vehicle theft. Existing detection systems based on traditional Computer Vision are not sufficient enough to handle heavy traffic experienced in the city and require something robust system based on Machine Learning(Neural Network) which would train itself to detect the same.

Keyword*-Machine Learning, Tensorflow, Object Detection, Video based, RTO, CCTV*

CE-26: FACE RECOGNITION BASED AUTOMATED ATTENDANCE SYSTEM USING MACHINE LEARNING

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Abstract- Nowadays, everything around us has become dependent upon technology to make our life much easier. Daily life tasks are continuously becoming automated. But still today, the process of recording student's attendance at the university is manual. Lecturers use traditional attendance sheets and signed papers to mark attendance. This is slow, inefficient and time consuming. The main objective of this paper is to offer system that simplify and automate the process of recording and tracking student's attendance through face recognition technology. Today, face recognition technology is widely used in different areas such as airports, banks and offices. We will use deep learning techniques such as Convolutional Neural Networks (CNN) to detect, recognize and verify the captured faces. We aim to provide a system that will make the attendance process faster and more precisely.

Keywords- *Convolutional Neural Networks.*

CE-27: Survey on Generative Web Chat Service

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Abstract- In today's world there is a trend of intelligent machine. Evolution of artificial intelligent, machine learning and deep learning, have started machines to mimic as human. A traditional software agents activated by natural language processing is known as Chabot. This paper presents a survey on existing chat bots and different techniques applied into it. It discusses the differences, similarities and limitations of the existing chat bots. Here we compare functionalities and specifications of the existing 11 chat applications services. Research makes it visible that nearly 75% of customers have experienced poor customer service and generation of meaningful and informative responses remains a challenging task. Previously methods for developing chat bots depend on hand-written rules and templates. Moving towards deep learning these models were rapidly replaced by end-to-end neural networks which can directly convert an input data into output prediction. More specifically, Deep Neural Networks is a powerful generative based model it effectively solve the informal response generation problems. This paper shows an in-depth survey of recent literature, related to chat bots which are published in the last 5 years. This paper also presented why current Chabot the models fail to estimate when generating responses and affects the quality conversation.

Keywords*—Chabot, deep learning, neural networks, natural language processing, artificial intelligence, machine learning, seq2seq, RNN.*

CE-28: Automatic Generation of Student Profile

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Kale Saurabh, BE-Computer,VIIT Pune

Abstract- Educational Institutes have all kinds of data such as academic, placement details, extra/co-curricular data, etc. Currently they don't make use of this data. We can use this current data with the historic data to build a system which will help students to rectify their strengths and weaknesses and work on them. Faculty will also get an idea about where the students are lacking and help them accordingly. We can create a selection criterion for placements which will cover academics, extra/co-curricular, certifications. Educational institutes contain lot of data into raw format. This data can be attendance, marks, co-curricular, extracurricular and Internship certificates. This system efficiently stores the data into the database. With this system, the student profile is created which can be used by the professors to find the strengths and weaknesses of students and then help them to improve their performance in exams. Student profile can be used for placement. The companies which come for placement will give the required criteria and accordingly the students whose profile match the criteria will be suggested to the company. This way the company gets the required students. Also the students who are likely to be placed in some companies are suggested to the students.

Keywords-Data Mining, Linear regression, KDD, Elastic Search

CE-29: Generating Data Summary Document for Accreditation Bodies

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Vishal Jagtap, BE-Computer,VIIT Pune
Jay Bhalsing, BE-Computer,VIIT Pune

Abstract- Educational Institutes have all kinds of data such as academic, placement details, extra/co-curricular data, etc. Currently they don't make use of this data. We can use this current data with the historic data to build a system which will help students to rectify their strengths and weaknesses and work on them. Faculty will also get an idea about where the students are lacking and help them accordingly. We can create a selection criterion for placements which will cover academics, extra/co-curricular, certifications.
Educational institutes contain lot of data into raw format. This data can be attendance, marks, co-curricular, extracurricular and Internship certificates. This system efficiently stores the data into the database. With this system, the student profile is created which can be used by the professors to find the strengths and weaknesses of students and then help them to improve their performance in exams. Student profile can be used for placement. The companies which come for placement will give the required criteria and accordingly the students whose profile match the criteria will be suggested to the company. This way the company gets the required students. Also the students who are likely to be placed in some companies are suggested to the students.

Keywords-Data Mining, Linear regression, KDD, Elastic Search

CE-30: Analyzing Awareness of Government Scheme using Swachh Bharat Tweets

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Abstract-This paper is about analyzing the tweets on Twitter for "Swachh Bharat". Reason for using Twitter for analysis is because Twitter is one of the most popular and most observed Social Media Platform which had about 200 Million registered users by 2013, producing 400 million tweets every day. Tweets are the most up-to-date and inclusive stream of information and commentary on current events.

Government of India (GOI) has recently launched a scheme named "Swachh Bharat Abhiyan", in direction of making India a clean country. The performance of such initiative need to be evaluated to gain insights of public acceptance and for that, we are proposing a model that will extract the tweets from Twitter using Twitter Application Programming Interface (API), and analyze them for understanding the awareness of the scheme. These model will help to show if the proposed scheme have good/bad or positive/negative impact on the society.

Key words- Government, Analyze, Analysis, Swachh Bharat, Twitter media, Awareness.

CE-31: Automatic Tagging of Code-mixed Social Media Text

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Abstract—With the rise of multilingual speakers using social media as a communication platform, users often tend to switch between languages, this phenomenon is known as code mixing. Automatic language identification of this code mixed data has become a necessary task as well as challenge for NLP tasks such as sentiment analysis. We proposed a word level identification system that employs various techniques including a simple unsupervised dictionary-based approach, supervised word-level classification with non-contextual clues like capitalization, word length and suffixes as well as contextual clues. We have also implemented sequence labelling using Conditional Random Fields. We find that the dictionary-based approach is surpassed by supervised classification and sequence labelling and that contextual clues play a crucial role in this increased accuracy. We also define a metric system to evaluate the borrowedness of 230 most frequently used words while code borrowing

Keywords— *code mixing, POS tagging, supervised classification,Conditional Random Fields, word level language identification, Natural Language Processing*

CE-32: Android Application through social media

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Abstract-Nowadays physical activity is given second priority. Hence to overcome this kind of instances happening current mobile application provides a helping hand. In this paper we take a chance to present application Team-Up .This is considered as one of the app which not only has sports options but also provides with chat option which has an opportunity of hosting and posting different events related to sports.

Keywords: *application Team Up,chat options, sports*

CE-33: Cricket Match Win Prediction using Past Data of IPL Matches

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Abstract— Cricket Match win prediction is an important problem statement in Sports Analytics and has varied applications. The aim of the project was to build a Cricket Match Win Predictor for IPL Matches using IPL data of the past years. Firstly,data was extracted from kaggle which had the details of past 10 years of IPL Matches in 2 files. The data in the first file included the teams playing, Match Venue, Match Date, Toss Result and Match Result. The data in the second file included Ball by Ball statistics of the whole match. Using the ball by ball statistics and some more player data batting average and bowling average was generated for each player. Then an average of bowling averages and batting averages was taken for each team. Using the features from the first file and the averages generated using the second file, three machine learning models were trained. Random Forest were trained on this data and gave an accuracy of 58%. Neural Networks with Entity Embedding gave an accuracy of 65% on the test data. Xgboost gave the maximum accuracy of 68% . Finally, an ensemble of all the three models was used to give an accuracy of 69.5%.

Keywords— Data, Machine learning Models, Random Forests, Neural Networks, Xgboost, Ensemble learning.

CE-34: Interactive Video Learning Using Affective Computing

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Harshal Panpaliya, *BE-Computer, VIIT Pune*
Sandesh Pokharna, *BE-Computer, VIIT Pune*

Abstract— E-learning is a learner-centered, personalized learning technology. Online learning management system helps to track, report and deliver educational courses, training programs, or any other learning and development programs. Various e-learning models have been proposed till date and large amount of work is done in this field. Systems have been developed which involve taking feedback at the end of video or during fixed intervals of video. Quizzes, questionnaires are included as overlay slides between video intervals to make use of user's cognitive abilities. Student's affective states in learning have a significant impact on engagement and learning outcomes. The learner's engagement in learning process can be determined by recognizing learner's emotion. The current e-learning systems often lack many features of profound affection, and fail to provide suitable emotional interaction. There is also a need to analyze the affective states and abilities of the user where current research has shown a trend now. Student profile needs to be maintained and examined to guide the user for future learning and further progress. We have proposed our approach to develop an emotionally interactive learning system. In this system, we introduce seven emotions with positive & negative emotion recognition methods using facial emotion. We attempted to recognize seven emotions such as Angry, Disgust, Fear, Happy, Sad, Surprise, and Neutral and classify the calculated emotion-recognition scores into positive, negative and neutral emotions using LSTM-RNN. Then accordingly interaction is carried out between system and learner using NLP.

Message from Head of Information Technology

It gives me an immense pleasure to bring out the new edition of Vishwacon-19 and take this opportunity to welcome you for this prestigious event here at VIIT. This year, we have included major thrust areas of research in academia and industry which will help not only my UG and PG students but the students and professionals all across the country. So, it is a good opportunity for all the participants to showcase their talent by disseminating their knowledge in the field of Information Technology.

I am thankful to all the authors for their whole hearted contribution and also take this opportunity to thank organizing committee, reviewers and chair persons of all the technical tracks. I wish all the success to this conference. You can consult us for any suggestions and comments.

Narendra P. Pathak
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Department of Information Technology

IT01: Authentication System for Android Smart phones

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Sachin D Lohar, BE-Information Technology, VIIT Pune
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Mrs. Suruchi Dedgaonkar, Asst. Professor, Information Technology, VIIT Pune

Abstract - In today's growing world smartphones have become bigger and attractive target for hackers to exploit. Thus creating opportunities for developers to create various authentication systems for android smartphones. We have studied various authentication systems for android smartphones. Each system has its own advantages and disadvantages.

IT02: DIGI-LYCEUM :-Indoor Navigation Using Augmented Reality

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Yash Panwala, BE-Computer, SCET Surat
Prof. (Dr.) Dipali Kasat, Computer Engineering, SCET Surat

Abstract- Navigation entails the continuous tracking of the user's position and his surroundings for the purpose of dynamically planning and following a route to the user's intended destination. The Global Positioning System (GPS) made the task of navigating outdoors relatively straightforward, but due to lack of signal reception inside the buildings, navigating indoors has become a very challenging task. With regard to this, a variety of new techniques exists that can be harnessed to solve this problem.
Apart from that, the augmented reality technology (AR) enables applications to generate and align a supplemented view of the real world. Thereby, we incorporated augmented reality into indoor positioning and designed a novel user interface with a compelling application that delivers an interactive indoor navigation experience through augmented graphical views aligned with indoor objects.
Key words- Augmented Reality, Navigation, Indoor location, Global Positioning System (GPS).

IT03: E-Learning App and Development Tracker for Autistic Children using Android and Machine Learning

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Bhavana Venkalas, BE-Information Technology, VIIT Pune
Harsha Bharule, BE-Information Technology, VIIT Pune
Mrs. Priya Shelke, Asst. Professor, Information Technology, VIIT Pune

Abstract— Autism can make it difficult for a child to learn even small things. This project is one step towards easy learning, teaching and understanding learning pattern of such children. Also it assesses development of that child using machine learning algorithm K-Means clustering. Overall the app supposes to be fully customized, more user friendly and effective to improve learning skills for specially abled children. Project has e-learning mode and autism severity assessment mode.
Keywords— Autism, behavioral analysis, K-Means clustering, autism severity, puzzle score.

IT04: Literature Survey on Woman Security Device

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Rutuja Khot, BE-Information Technology, VIIT Pune
Prajwal Ganeshe, BE-Information Technology, VIIT Pune
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Abstract - Today in the current global scenario, the most important question is about women security. As this been rising in India at very increasing rate and every women is facing security problems as they are facing eve teasing, harassment. The only thought of every girl is when they will be able to move freely on the streets even at late hours without worrying about their security. When there will be no cases regarding women security issues then only feat will be achieved. Since humans can't respond that efficiently in critical situations, the need for a device which automatically senses and rescues the victim is the venture of our idea in this paper. Here we have discussed about the services available for woman security in the form of devices or applications.
Key words- Wear, Security, Smart Band, Hardware.

IT05: Survey of Tangible User Interface And It's Applications

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Abstract- Tangible User Interface (TUI) is a technology which helps physical objects to communicate and interact with the digital world. As TUIs support multiple user environment, it's extremely easy to understand and use TUIs. While 92 percent of information submitted to the brain is visual, learning styles vary among the population. Some learn kinesthetically, while others are auditory learners. Visual content is processed much faster and easier than text. The majority of the population, 65 percent to be exact, are visual learners. We put forth a solution to counter the traditional learning methodologies and present a literature survey of how TUI can be used for educational purposes and ease the task of students in understanding complex concepts. As TUIs also support multiple object tracking, it will not only help the students visualize scientific concepts but also help them in mathematical concepts by positioning the physical objects in different shapes.

IT06: Freeware Solution for Preventing Data Leakage by Insider for Windows Framework

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Abstract— Every organisation has some crucial data that holds the reason for its competitive advantage over others. This data includes intellectual property, trade secrets, salary details etc. Non-ethical disclosure of such data can have fatal impacts. Recent incidents of data leaks cannot be overlooked, therefore every organisation should preferably use Data Loss Prevention(DLP) system to avoid the risk of data leakage. The aim of this work is to develop a freeware DLP that will help small and medium scale organizations to protect their covert data. There are numerous channels of data exfiltration such as Bluetooth, E-mail, Universal Serial Bus(USB) etc. This solution uses emerging technologies and integrates kernel space modules and machine learning approach to deliver a novel solution. It intercepts file transfer actions through a USB port and checks the contents of the file.
Index Terms— Data Loss Prevention; Windows OS; USB; Minifilter Driver

IT07: Survey of different document classification algorithms

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Abstract- Document Classification is the process of classification of documents into predefined category based on their content. It finds a lot of importance in data mining also it helps automate the task of organizing and managing documents. There are several methods through which the problem of classification can be solved. We put-forth a study of different classifiers that are used for classifying documents. We use Multilayer feed forward neural network (also called multilayer perceptron) trained using backpropagation algorithm. Neural networks are a highly good solution for non-sequential problems have ability to learn and model non-linear and complex relationships and model generalize solutions that can predict on unseen data.
Keywords- Multilayer Feed-Forward Neural Network, Backpropagation, K-Nearest Neighbour, Support Vector Machines, Naïve Bayesian, Neural Networks, Artificial Neural Network System.

IT08: Chatbot for VIIT Library

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Abstract- A chatbot is meant to make a conversation between human and machine. It has been embedded with knowledge for identification of the user's sentences and to make a decision itself as a response to answer the question. The objective of the project is to build a Library Enquiry Application using the chatbot concept for students and faculty members of VIIT to provide faster and appropriate responses to their queries. It will also give a prototype for searching the books using table of contents. This chatbot will be built by using Google's Dialogflow for NLP, Android studio for user interface and Google's Firebase as the database to store and retrieve information. The connections of these layers will be established by writing fulfilments of dialogflow and interaction through slack. Many companies like Dominos, KLM Royal Dutch Airlines, and Ticket Master have used Dialogflow for building their interactive bots. Our end product will be an android application which will interact with the college members. Thus, the proposed system will be able to process the user input using natural language processing, match the input with the database and then generate a suitable response.
Key words- Wear, Chatbot, NLP, prototype, fulfilment, Android

IT09: Literature Survey on Intelligent Time and Money Manager

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Abstract- Intelligent Time and Money Manager System provides the efficient way to track expenses with minimum efforts and enhanced capabilities like suggestions for adding expenses based on location of user with the help of GPS. It performs data analysis and provides facile way to track expenses where remembering the details of the whole day where user had visited was not required, using automatically generated list of visited locations. In addition to expense tracking system, the location data used for expense tracking allows user to add note for any task done at that location. The notifications for updating the expenses were based on staying at any location for specifically some threshold amount of time and past data. The virtual assistance were used to solve user queries regarding expenses. It provides analytical reports regarding the expenses of the users.

Key words- Intelligent, GPS, Virtual, Assistance, Analytics, Threshold.

IT10: Securing IoT data using KMIP and computing in Fog

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Abstract- Internet of Things (IoT) rapidly generates bulk of data that is private and requires security. While encryption is a good solution, but mishandling and mismanagement of cryptographic keys can make data equally vulnerable. The cloud storage of this ever increasing data is also becoming inefficient and costly. The system proposed manages the cryptographic keys with Key Life-cycle Management System (KLMS) via Key Management Interoperability Protocol (KMIP). The system maintains a Fog node which is responsible for performing intelligent computation on data. The fog node decrypts the data by fetching the cryptographic key, performs computation and later encrypts. The data is then stored on public cloud where it is available for the user to decrypt and view it. The KLMS is responsible for handling and management of cryptographic objects.
Keywords - Key Management Interoperability Protocol (KMIP), Fog computing, Key Life-cycle Management Sys-tem (KLMS), IoT security, Cloud storage efficiency.

IT11: Crop Planner and Fertilizer Scheduler in Smart Agriculture

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Abstract- Internet of Things (IoT) technology has brought revolution to each and every field of common man's life by making everything smart and intelligent. IoT refers to a network of things which make a self-configuring network. The development of Intelligent Smart Farming based on IoT devices is increasing day by day which help in turning the face of agriculture and also increase the production by not only enhancing it but also making it cost-effective and reducing wastage. The basic objective of this project is to predict suitable crop based on the values obtained from environmental sensors (Temperature, soil, and humidity) and second objective consist of fertilizer scheduler which will suggest required amount of fertilizer for proper crop growth.
Keywords- crop planning, fertilizer scheduler, crop details, decision making, k-means algorithm.+

IT12: Literature Survey on Anomaly Detection as an Application of Video Analysis

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Abstract- Videos are being used in various forms and for different purposes everywhere. Be it for entertainment purposes, monitoring, storage or broadcasting, videos are conveniently accepted by people worldwide. Seeking information from a video requires analyzing it thoroughly. This constitutes the field of video analysis. In this literature survey, we have discussed how the knowledge of video analysis could be applied for detecting anomalies. An anomaly can be defined as any abnormal or unusual situation in a particular environment. Thus, we have gone through various fields in which anomaly detection can be used to benefit the society.

Key words- Anomaly, object detection, CCTV, illegal parking

IT13: Significance of Advanced Visualization Strategies for Varied Visualization Purposes

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Abstract- Data visualization is a robust technique which plays a vital role in enhancing data driven business decisions. Visualization is a front end element of the data analysis system. The key role of visualization is to present the large data in graphical format such as charts. However, the concept of visualization is not limited to merely presenting the structured data graphically, but also to discover the hidden insight from the huge data stored. Accordingly, the key purposes of data visualization are Data Exploration and Data Presentation. Data exploration helps in gaining knowledge and data presentation conveys a known story. While data exploration supports the user to extract the valuable hidden insight from the vast data, data presentation allows the user to present the extracted information graphically to the audience. Considering these two different purposes of visualization, it is essential to define precise visualization strategies for different aims. The conventional visualization tools and techniques are not adequate to visualize high volume and varied data for getting significant information. Aiming the visualization purpose, defining the visualization strategies is essential for the decision makers before presenting the data in chart format. Visualization strategies integrate the factors such as the purpose of visualization, commercial approach, requirement of coding knowledge and target audience. The advanced strategies will help in selecting the appropriate tool among the numerous visualization tools existing. This paper states the difference between Data Exploration and Data Presentation, key purposes of visualization and also describes significance of defining advanced visualization strategies based on varied visualization purpose.

Key words- Visualization, Visualization Strategies, Data Exploration, Data Presentation

IT14: Voice Recognition based Attendance System

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Abstract – Biometric Recognition System is automatic recognition system which detects and identifies individuals on the basis of their physical and behavioral characteristics. Our target is to build such a system which can mark the student present or absent based on their voice. We have studied various searches regarding to the Voice Recognition System. Each system has its own advantages and disadvantages.

IT15: Document Clustering Using Hadoop Framework

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P Srinivasa Rao, MVGR College of Engineering, Vizianagaram
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Abstract-: Lot of researchers and companies are exploring the importance of personalized applications that manage this deluge by tailoring the information presented to individual users. All these applications have to gather, and exploit, some information about individuals in order to be effective. This area is broadly called user profiling. In this paper, we shall adopt an effective technique for collecting information about users, representing, and building user profiles. In particular, explicit information techniques are contrasted with implicitly collected user information using browser caches, proxy servers, browser agents, desktop agents, and search logs. After getting the user profiles, we shall maintain the database of the material browsed by the users and shall manage the content based on the users' interest. To make this process easier and speedy, we are going to use Hadoop distributed framework to reduce the time of accessing the content. In this project we shall manage the content in the central repository called HDFS (Hadoop Distributed File System).

Key words-Document Clustering, Hadoop, HDFS.

IT16: Concrete Quality analysis using Neural Network.

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Priyanka Birajdar, -Information Technology, VIIT Pune
Shubham Channa, -Information Technology, VIIT Pune

Abstract:-
People expect quality work in every aspect of life. Quality is important in every aspect especially for permanent structures like house, dams, flyovers etc. If there is no quality in construction it may lead to many problems like leakage of water, blockage of pipes, collapsing of buildings etc. So developing a methodology for analyzing the quality of concrete used in construction is necessary, which can be done by extracting
feature of image and analyzing it using particular algorithms. So we are going to develop an android application using which user can upload/capture an image of mixed concrete. The captured will be sent to python web server and using ANN (Artificial Neural Network), images will be classified to different classes according to their VSI index. The previous project is on Matlab framework which is not an open source
platform. So to increase the scope of usability we are developing it in Python which is an open source platform. We are using Spyder as Python IDE to develop system. In the gap analysis we found that segregation/bleeding of water from concrete mix and gradation of concrete (distribution of coarse particles) was not considered to calculate quality score, So we are going to include these two features to calculate quality score. Also the standard dataset was not build for training the neural network so we are going to build a dataset and do the subjective analysis of the created dataset.

IT17: A new way to explore Reality

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Abstract- This paper gives brief information about ARCore Augmented Reality and its various technological advancements. It further discusses about Augmented Reality, Virtual Reality and Mixed Reality. Augmented Reality helps to overlap real world contents and allows transforming lifeless objects into interesting one. Virtual Reality provides a whole new experience creating a virtual world where user can interact with virtual objects. Mixed Reality is the combination of both of these technologies. Unity3D is the platform which helps to develop applications involving these technologies. Google ARCore, Apple ARKit, Vuforia, Wikitude are some of the Software Development Kits which helps in Augmented Reality developments. In this paper, Google ARCore is explained with its various applications in interior designing, industries, medical and with a case study of Space Measurement Application.

Keywords- Unity3D, ARCore, Augmented Reality, Virtual Reality, Mixed Reality

IT18: Product Services through Augmented Reality

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Arif Khan Pathan, TE-Information Technology, VIIT Pune
Priyanka Kara, TE-Information Technology, VIIT Pune
Swati Choudhary, TE-Information Technology, VIIT Pune

Abstract: This paper deals with the latest trends in technology over Augmented Reality in various fields especially in product service industry. Augmented Reality has been proved helpful for companies to Endeavour quality training of their attendants. We have created an Android based application which primarily deals with object detection using Vuforia SDK with help of Unity 3D and augmented a real world water purifier. We created a product service manual for effectively replacing motor from the product by helping the end user through proper guided steps and information. An additional feature has also been thoroughly discussed and is being added in the application for e.g. feature of claiming warranty of faulty motor can also be done through the application.

Message from Head Mechanical Engineering

It’s a great pleasure for me to welcome you all for the National Conference on Recent Trends in Engineering & Technology-VISHWACON 2019 for students, working professionals, and scientists around the world to disseminate the knowledge and research in the contemporary issues in the field of mechanical engineering. Papers were invited on various aspects of mechanical engineering such as applied mechanics, design and manufacturing, heat transfer, fluid mechanics, instrumentation and measurement, nanotechnology, surface chemistry, ceramography, metallurgy, biomaterials, electronic materials, tribology, forensic engineering, crystallography, materials characterization, automation, robotics, control systems. We thank all the authors for their response to ICRTET-VISHWACON 2019. We take this opportunity to thank members of the program committee and the session chairs who ensured high quality of manuscript for the papers. We appreciate the enthusiasm and hard work of student volunteers of MESA. I would like to express appreciation to the convener and departmental coordinators.
I hope that the proceedings will serve as a useful reference of the state-of-the-art knowledge in advances in Mechanical Engineering.

Dr. A. R.Mache
Head Mechanical Engineering

THA001-Design and Development of Solar Powered Stirling Engine for Electricity Generation

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Abstract- In this study, a gamma Stirling engine with 55 cc swept volume will be designed and developed. The design calculations of the kinematic Luna engine is used for the design calculation in this study. The dimensions of different parts like hot and cold cylinder, crankshaft and piston are calculated. The engine is going to be tested by using helium as a heat source. The working characteristics of engine will be obtained within the range of heat source temperature ranging from 650-750 ℃ and the range of charge pressure 0-10 bar. The maximum power output will be obtained as 1 kW-hr with helium at 750 ℃ heat source temperature and 10 bar charge pressure.
Keywords- Gamma Stirling engine; Helium; Scheffeler Dish

THA002-Cooling load calculation procedure for homemade ice-cream maker

Sudhir Chougule,
Suresh Sawant, Professor, Mechanical Engineering, RIT Islampur

Abstract- Ice cream is the most common frozen dairy product. History of ice cream is closely associated with development of refrigeration technique. Hand cranked and electric ice cream machines are the basic types of homemade ice cream maker. Fat, milk protein, lactose, other sugars, stabilizers, emulsifiers, flavors, colors and waters are the total ingredients of ice cream. Ice cream making has following process (1) mix preparation (dosing and mixing the ingredients, pasteurization and homogenization), (2) ageing, (3) freezing, and (4) hardening. Homemade ice cream maker does not include homogenization and pasteurization. Ageing and freezing are the two important stages of ice cream making. Total cooling load calculation is the first step in the designing of homemade ice cream maker. It includes transmission load, product load, internal load, infiltration air load, and equipment related load. Product load and internal load are the major contributors in the total cooling load. Product load is mainly depends upon the properties and composition of the ice cream ingredients. Internal load is depends upon equipment placed in the refrigerated space or equipment used for processing and mixing. As homemade ice cream maker is insulated transmission load is negligible, and because of it is properly sealed infiltration air load is also negligible. As load calculation is the first step of designing the homemade ice cream maker, it should be done carefully. Cooling load calculation is the important procedure in designing homemade ice cream maker.

Key words-Ice cream maker, ingredients, ice cream manufacturing process, and total cooling load.

THA003-CFD Analysis on NACA 4415 at various Mach numbers

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Abstract— In this paper the unsymmetrical aerofoil NACA 4415 of aerodynamics is studied which has various applications such as Turbine Blades, Aircraft wings, UAV and so on. As in the case for most unmanned aerial vehicle (UAV), wing profiles or aerofoils have a large influence on the lift and efficiency. The reason of study is to investigate the aerodynamic characteristics of NACA 4415 at different Mach numbers. Using Computational Fluid dynamics (CFD) Analysis feature of ANSYS 16.0 the three dimensional aerofoil geometry was created and then by application of suitable boundary conditions we simulated the airflow about the aerofoil at Mach numbers from 0.3 to 1.0 typical to UAV. The effect of the increasing velocity over the aerofoil up to Mach number 0.8 which can be terms as stall Mach number for the aforementioned aerofoil was studied. For the Mach Numbers 0.9 and 1.0 due to increase in shocks and vibrations as the aerofoil is not able to generate lift and on the other hand as drag increases beyond safe values, under such situation by provision of suitable angle of attack the scope of the project was to reduce its drag and simultaneously increase lift so that the application of the aerofoil can be operated at this particular Mach numbers. As in above case it's effect are also similarly studied by means of the co-efficient of drag and lift and subsequently pressure and velocity contour is obtained where the values where in the safe region so this fulfils are main objective of this paper.

Keywords—UAV; NACA 4415; Mach number; aerofoil; lift; drag; CFD

THA004-Analysis of performance ratio of rooftop Solar system

Saumya Shalgar, Harshada Velhal, VIIT Pune.

Abstract: - As we are aware of the need for renewable sources of energy has increased in the past decade. This is basically due to the over consumption of non – renewable resources for example, coal is major source of fuel all around the world. It takes many years for the generation of coal which is not matching with the current requirement. It is a great need to shift from conventional to non- conventional sources of energy. One of the main non -conventional sources of energy is the Sun. This review represents the performance of an industrial rooftop solar system. The aim of this analysis is to estimate the efficiency of solar power plant so that the feasibility of the system.

THA005-Solar Technologies for Power Production: A Review

Apurva Bhosale, Chaitanya Rane, Abhjeet Pawar, Harshada Velhal, VIIT Pune.

Abstract: This comprehensive review highlights the solar energy potential in a field of power production by most significant methods. The world of power generation is fully dependent on conventional fuels. As indicated by current situation about 80% of conventional fuels are utilized for producing power. Due to extinction of fossil fuels in future, it is necessary to move towards non-conventional assets like solar, wind, tidal, biomass, geothermal, etc. Of all the accessible renewable resources, the most abundant is solar energy. These leads to the advancement and attracts many researchers in field of solar energy. Concentrating solar power (CSP) has received remarkable recognition overcoming intermittent solar resources. The two most dominant system that are either operational or in the construction stage are Parabolic Trough and Solar Power Tower. This paper insights advanced development in solar technologies for power production.

Keywords: Solar Energy, Concentrated Solar Power (CSP), Parabolic Trough, Enclosed Trough, Power Tower System, Dish Collector System, Fresnel lens, Nanofluids.

THA007-Green engine

Rushikesh Shirsath, Rahul Jadhav, Shubham Khairnar, TE Mechanical, VIIT Pune.

Abstract: Innovative thinking leads to development of new technologies. Today, the world is facing serious pollution crisis due to the exhaust gases from vehicles using petroleum-based fuel. The pollutants like HC, NO_x occurs due to the incomplete combustion of fuel. These pollutants are very harmful to human being causing various diseases. Also, the fuel recourses are depleting rapidly. To counter this problem the only solution is to burn the fuel completely inside the combustion chamber, which can be obtained by proper mixing of air and fuel before the power stroke. This introduces the concept of *GREEN ENGINE.* This paper includes introduction to Green Engine, technical features, working and comparison with the conventional internal combustion. Engine, also its Pros and Cons with future applications. This is six phases I.C. engine in which the priority is given to the proper mixing of fuel with the air thereby causing its complete combustion. Due to six phases of working, air-fuel mixing process and constant volume combustion with controllable time is achieved. So, the Green Engine becomes the only real multi-fuel engine on our planet that is any liquid or gaseous fuel can be used. Therefore, this also helps to overcome fuel-crisis. "GREEN ENGINE" will bring new revolution in the field of engine technology.

Keywords – Green Engine, HC, NO_x, Six Phases, Multi-fuel engine.

THA009-Performance analysis of vortex tube using mild steel material

Nikhil Choudhary, Harshada Velhal, VIIT Pune

Abstract: In present the important quality of any research is its eco-friendly nature by virtue of which it fulfils the industrial requirements. Such one of the eco-friendly systems used for instant heating or cooling effect is vortex tube. It is the simple mechanical device with no moving parts which splits the high-pressure air stream into hot and cold air streams. The concept of vortex tube is used where instant spot cooling or heating is required also for cooling electronic controls, setting hot metals, cooling environmental chambers also it can be used to maintain the temperature of body of workers working in adverse environment like mines etc. Many researchers are working on the concept for complete analysis of vortex tube in that they experimented with different nozzles and varying nozzle area and found improved cooling efficiency. The paper summarizes the performance of vortex tube using mild steel material under different pressure and temperature ranges. The experimental results revealed that the maximum coefficient of performance is 0.0467 at 30°c temperature.

Keywords-vortex tube, Coefficient of performance

THA010-Performance Analysis of Vapour Compression System with Spiral –Micro Tube Condenser

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Abstract- From 19th century, we use the refrigerator for cooling purpose which is based on vapour compression cycle. In any type of refrigeration system, energy recovery is main requirement to get optimum energy consumption. In this paper, we are trying to decrease energy consumption by elaborate performance of condenser. By studying different research paper on condenser performance, we found that the performance of U-shape coil heat exchanger is comparatively less than that of spiral shape coil heat exchanger. Another parameter is consider in this paper is the heat transfer area of heat exchanger. As the heat transfer area of heat exchanger increases, performance also increases. . The purpose of this paper is to compare experimentally coefficient of performance of refrigerator by using micro tube air cooled condenser with the conventional type condenser by optimizing the condenser parameter.

Keywords –Refrigeration, Micro tube

THA012-Design and Fabrication of Evaporative Condenser

Atharv Aniruddha Gokhale, Vinayak Gaikwad, Pranav Dandekar,
Shubham Chapparghare, Dr. Ajay Kale, VIIT Pune

Abstract:- In evaporative condenser, ambient air and water are used as a cooling medium. An evaporative condenser uses a system of tubes which is exposed to a defined spray of water and fan facilitated ambient air flow to cool and condense hot refrigerant vapours. As the water is sprayed on condenser tubes through the nozzles in atomized form, evaporative condensers consume very less water. In comparison with surface condensers water consumption of evaporative condenser is about 30 to 40%. This paper highlights the fundamental thermal design procedure of evaporative condenser. Detailed design calculations have been carried out manually by using first principles. The calculation of thermal design parameters of evaporative condenser of an air conditioning unit is carried out according to the design parameters specified by the sponsoring industry 'Active Engineering Services'. A model of an evaporative condenser is designed with 1.5 TR capacity. Overall dimensions of Evaporative Condenser, Selection of bought out components, fabrication and assembly will be carried out based on design analysis and industry norms. Final outcome will be fabrication of Evaporative Condenser for demonstration purpose.

Keywords: - Condenser, Heat transfer coefficients, Refrigerant, De-superheating, Phase change

THA014-Cooling of electronic components using phase change material – an overview

Aditya Patil, Suyog Gore, Mr. A. R. Dhumal, VIIT Pune

***Abstract*:** A case study was performed on how the phase change materials help to cool the electronics system. Various phase change materials, their requirement for particular application and various ways to increase heat transfer of phase change material were studied. The results of techniques used to increase the heat transfer were compared with the pure phase change material's heat transfer.

Keywords: cooling system, phase change material

THA015- Review on Magnetic Refrigeration System

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***Abstract*-** The purpose of this study is to determine the feasibility of designing magnetic refrigeration which uses solid materials like Gd5Si2Ge2 as the refrigerant. It is a method of refrigeration based on the magneto caloric effect which means the response of a solid to an applied magnetic field which is observable as a change in its temperature. When a magnetic field is applied, these metals known as ferromagnet tend to heat up. As heat is applied, the magnetic moments align when the field is removed; the ferromagnet cools down as the magnetic moments become randomly oriented. It was found that, two types of magnetic phase changes occur, FOMT (First order magnetic transition) SOMT (Second order magnetic transition) of which FOMT materials are better. As magnetic refrigeration system does not use gas compressor, no pumps, no working fluid, no valves and uses only one moving part i.e. the rotating disc on which the material is mounted hence it has low cost, longer life & high efficiency. This system does not use any ozone destroying elements like chlorofluorocarbons or hydro chlorofluorocarbons hence it is environmental friendly. Commercial applications include cooling of electronics, super conducting components used in telecommunications equipment, home and commercial refrigerator ,heat pumps, air conditioning for homes, offices and automobiles and virtually any places where refrigeration is required but few prototypes are developed & there are still many challenges are to be overcome like availability of magneto caloric materials which are rare.

***Keywords*-** Magneto caloric, Ferromagnet, FOMT, SOMT

THA016- Study of Enhancement of convective heat transfer using Nano-fluids.

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Abstract: Nanofluids are considered to offer important advantages over conventional heat transfer fluids. Over a last decade, researchers focused on measuring and modeling the effective thermal conductivity and viscosity of nanofluids. Recently important theoretical and experimental research works on convective heat transfer appeared in the open literatures on the enhancement of heat transfer using suspensions of nanometre-sized solid particle materials, metallic or non-metallic in base heat transfer fluids. The purpose of this review article is to summarize the important published articles on the enhancement of the forced convection heat transfer with nanofluids. Fluids such as water, oil, glycol if used directly in convective feat transfer applications, have proven to be ineffective. This is because these fluids have a very small value of thermal conductivity, which intern affects the heat transfer coefficient of these fluids. So, in order to address this shortcoming researchers have tried out different methods to modify these fluids in terms of their chemical composition. One such method is adding of nanoparticles in the fluids which enhance the heat transfer coefficient of these fluids. This nanoparticle is nothing but metallic or non-metallic solids with sizes ranging from 1-100 nm with higher thermal conductivity. Materials being used as nanoparticles are Fe_3O_4, Al_2O_3, and Cu etc. In this paper we have reviewed different nanofluids and their effect on convective heat transfer. This comparative study will help researchers in this field to take a comprehensive look at different nanofluids and their effect on convective heat transfer.

THA017-A comparison of prediction of Primary atomization for Urea-water spray using major commercial CFD codes

Swati Bhagwan Ajetrao,

S. M. Sawant, Professor-Mechanical Engineering- RIT, Islampur.

Abstract- Primary jet break up of urea-water spray using best possible combination of settings of the solver, turbulence model, solution time required, computational cost etc. to achieve reasonable results that validate well with experimental results is the program goal. According to literature, study of atomization started by Schweitzer, after which theoretical behavior of atomized liquid from different kinds of atomizers was well explained by Lefebvre, 1989, in analytical form. Theoretical behavior is analyzed numerically using different kinds of solvers in CFD. Eulerian model is mostly used. 3D modeling is computationally very expensive as it requires large number of cells across the jet, and this need is clearly cited in many papers. So, 2D modeling is being attempted for the initial study. Automatic meshing is one of the approach which can be a solution for 3D modeling which has huge cell count. Parametric studies have been done for the following variables: momentum flux ratio, weber number, swirl inside cross flow, jet velocity profile impact, cross flow velocity, jet velocity, co-axial velocity etc. Experimental test conditions are explained with results which can be used for validating numerical results. Determination of breakup length, spray cone angle, penetration of jet inside exhaust gas, droplet distribution is the objective of project. Numerical results are validated with experimental results in the form of droplet distribution in most of the studies. New hybrid model (Eulerian + Langrangian) is also a better option to model primary atomization.

Keywords- Review-Primary jet break up, droplet distribution, Eulerian model, automatic meshing, and Hybrid model.

DEA002 - Design and Fabrication of Electrochemical Disinfection System for Water Treatment

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***Abstract*-**As many industries produce waste water containing toxic organic pollutants there is an increase in need and demand of pure water. This project is one of the means by which we can purify this waste water. The project discusses about electrolysis of water for treatment of microbial hazards present in swimming pool water. The system is specifically designed for the destruction of bacterial organisms and other organic pollutants present in water. The current methods used for cleaning the swimming pool water are less efficient and are hazardous to health (e.g. Use of chlorine). The Electrochemical Disinfection System approach provides the safest and better method of purifying the water which will have a better efficiency and will be less hazardous as there is no use of chemical compounds in purification of water.

***Key words*-** Electrochemical Disinfection System, Boron Doped Diamond, Electrolysis, Screening, Filtration

DEA003-Review on Improved design of extended end-plate connection allowing for prying effects.

Shubham Dhende, Akash Shedge, Ajinkya Chandgude, Vijay Gaikwad, M. G. Gadge, Professor, Mechanical Engineering, VIIT Pune

***Abstract*-** Connections are vital in affecting the safety of steel structures and connection failure is one of the main causes of structural collapse. Bolt connections are a dominant means of connecting structural members. In the design of bolt connections in steel structures, the effects of prying action on the connected parts and bolts should be considered because use of thick base plates to avoid its consideration results in lack of connection ductility which is undesirable. Although equations are available for prying action in Chinese, AISC and Hong Kong manuals or codes, they suffer some deficiencies. In this paper the researcher has discussed and compared better design method for extended end-plate bolt connection and design formulae in several codes. The researcher further proposes revision for the current formulae in codes and suggests design formulae for bending moment in bolts and in end-plate. The researcher also validates the equations with finite element analysis results, which show that the proposed method has a satisfactory accuracy for calculation of prying force and bending moment. The researcher also laid a foundation for the further study of moment–rotation relationship in end-plate connections used in direct or advanced analysis of steel frames.

***Key words*-** Bolt connections, Chinese manual, AISC manual, Hong Kong manual, Finite Element Analysis.

DEA004-Baseline and optimization of commercial truck chassis for frequency and frequency response function by fe methodology.

Pratik Hingane, Shrikant Kanade, Poonam Magdum, Kshitija Nagare, Dattatraya Nalawade, Mechanical Engineering, VIIT, Pune

***ABSTRACT**:* - The main objective of this paper is to optimize the performance of chassis and predicting its behaviour on different load conditions. In this project, modal analysis of a ladder chassis frame has been done using Hyper mesh13.0. Chassis is the most important structural member in the On-Road vehicles. Vibration problem occurs when the chassis is subjected to excitation forces such as bending, torsional, transverse forces. The effects of vibration are undesirable noise, excessive stresses, parts loosening and partial or complete failure of parts. If the natural frequency of vibration coincides with the frequency of external excitation, resonance occurs, which tends to excessive deflections and failure. Hence, it must be strong enough to resist the vibration, shock, twist and other stresses. This report involves the study of the dynamic characteristics of the truck chassis at different load condition and the responses of it, which include the modal analysis, natural frequencies and mode shapes by using finite element (FE) method. The dynamic stiffness method enables one to model an infinite number of natural modes by means of a finite number of degrees of freedom. The results obtained from the modified chassis are compared with the original chassis, and the most optimized chassis will be presented.

Keywords: - Modal analysis, resonance, mode shapes, natural frequency, dynamic characteristics

DEA005-Design and fabrication of test fixture to determine shear, compression and bending properties of composite materials as per the ASTM standards

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Mechanical Engineering, VIIT Pune

Absract – ASTM D3410 [refpaper] is a test method used to study the compressive properties of a composite material using a compression fixture. This test method determines the in-plane compressive properties of polymer matrix composite materials reinforced by high-modulus fibres. ASTM D7078 [refpaper] is a test method used to study the shear properties of a composite material. These fixtures are the support devices to find the ability of specimen to endure transversally applied force to the axis of the specimen. These fixtures will acquire properties such as compressive strength, modulus of elasticity, response curves. The commercially available fixtures are very costly. Once the designed fixtures are fabricated, the aforesaid properties of composite materials will be obtained in a very lucrative way.

Keywords – ASTM D3410, ASTM D7078, Compression fixture, Shear fixture, Bending fixture

DEA006-Design & development of automatic cotton collecting machine.

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Abstract In this project we have to design a cotton boll picker machine, this machine will be useful for harvesting cotton. Cotton plays an important role in our lives, most of the things are made of containing cotton. Cotton is the most abundantly produced natural fibre in the world. This machine will help small scale farmers for harvesting cotton. Nowadays there are machines available in market which is very costlier, which small scale farmers can't afford. But these machine small farmers can easily afford, and can perform harvesting. In India entire cotton is handpick by labour. There is internationally available machine for cotton boll picking which is costlier. By using the available machines, the strength of the cotton fibre is getting reduced. In this machine the strength of the fibre will not be affected, and it will provide the human comfort while performing cotton picking operation. And will reduce the wastage of money for harvesting machine. In this machine only, the cotton bowl is picked, which will not affect the cotton. As there are the machine in which along with the cotton so many unwanted materials like burr, leaves, are get collected in collector tank but by the use of this machine only the cotton is get collected in the collector thank. Almost 1/3rd of the cotton produced in the world is mechanically picked and about $2/3^{rd}$ is picked by hand, but increasing labour cost of farmers. This makes more countries to considered machine picking. This machine is fully mechanically operated and save the costs of small farmers which they spend on labour for harvestings.

Keywords – Cotton, Cotton Boll, Natural Fibre, Harvesting, Hand Picking, Cotton picker

DEA007Design of vacuum chamber for liquid helium bath type cryostat

Aditya Garde, Shubham Gadale, Omkar Kolekar, M. N. Jagdale, Assistant Professor, Mechanical Engineering, Dr. C. S. Garde, Engineering and Applied Sciences, VIIT Pune

Abstract- A liquid helium (LHe) bath type cryostat will cool down a sample whose opto-electronic properties are measured using a Near Field Scanning Optical Microscope (NSOM). At atmospheric pressure, the heat leak from surrounding (300K) into LHe bath (4.2K) is significant. A vacuum chamber has been designed to create a vacuum ~ 10-8 Torr around the LHe bath to minimize the heat transfer to the LHe bath through conduction. Space and weight, constrains arising due to vibration isolation table, have been considered while designing the SS chamber. Butterfly type valve is chosen to cut off the vacuum pump from the chamber in order to render the vibration arising from pumping. Standard SS pipes have been selected for evacuating the vacuum chamber. Also, KF flanges will be employed to connect the pipes to vacuum pump. Hermitically sealed electric feed-through are used. Further, a vacuum pressure gauge will be mounted on to the chamber. A Turbo-molecular pump with rotary pump backing and pumping line dimensions have been selected on the basis of pump down time.

DEA009-Design, analysis and optimization of screw feeder for limestone application

Sujeet Mutha, Yuthica Mandavkar, Ammar Walile, Akash Dadmal, Dr. Satish Chinchanikar, Professor, Mechanical Engineering, VIIT Pune

Abstract- Material handling is the movement, protection, storage and control of materials and products throughout manufacturing, warehousing, distribution, consumption and disposal. As a process, material handling incorporates a wide range of manual, semi-automated and automated equipment and systems that support logistics and make the supply chain work. Their application helps with: Forecasting, Resource allocation, Production planning, Flow and process management, Inventory management and control, Customer delivery, After-sales support and service. A company's material handling system and processes are put in place to improve customer service, reduce inventory, shorten delivery time, and lower overall handling costs in manufacturing, distribution and transportation.

Key words-Material handling, equipment, transportation

DEA010-Tracking of solar panel by hydraulic system

Prajakta Dasgude, Prajakta Arjun, Nidhi Shah, Avinash Somatkar, Professor, Mechanical Engineering, VIIT Pune

Abstract **-** Solar Tracking System is a power generating method from sunlight. Solar power is considered as reliable energy source for power generation and for many other applications. The challenge is to fetch maximum amount of energy from solar radiations in which sun is continuously changing its position in sky. This tracking system is for maximum intensity of light. .In this project work, with the title Tracking of Solar Panel by Hydraulic System, we were planning for design and developing a solar tracking system which will utilize mechanical energies for the tracking operation. At present, the solar tracking system use electrical energy for tracking operations and this electrical energy for operations is supplied by same solar panels or by external electrical storage or supply lines, this reduces efficiency of the solar panels. Using mechanical energy for tracking will increase the output of solar panels and remove the constraint on the location of the tracking system.

Keywords: Solar Tracking System, Hydraulic cylinder, Energy Efficient, Renewable Energy.

DEA011-Design and manufacturing of light weight surveillance system.

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Mechanical Engineering, VIIT Pune

Abstract- The purpose of making this kind of surveillance system is discuss in the introduction part of this paper. This kind of surveillance system (or artificial bird) is more beneficial in military based application. This paper consists of research conducted at the under-graduate student level. So in this paper our focus is NOT on the cost of the project (or cost of the total SERVELLENCE SYSTEM). Main objective of this project is, while bird take-off it can fly stably with proper working of designed mechanism and due to proper aerodynamic study of this bird is done. But, again due to time constraint our mainly focus is on the take-off of the bird and not manoeuvring it mid-air. For the stable flying of the bird, it is required to study the basic concept of bird flapping and biological tales of bird. As the wing span of the bird is more, the bird must have minimum number of flaps to achieve high altitude. In this we also study types of flights in birds. We select larger span bird and do biological study of it, which is discuss in introduction part. We find out actual weight, size and other require parameters. After that we select proper mechanism for flapping. We also do analysis of the individual parts of mechanism, only require parts. Also we attach the results of this analysis in this paper. Also we find out the forces by hand calculations, CFD in ANSYS and we are also going to conduct wind tunnel analysis on actual model. And from this forces we are conclude that, with certain assumption, is that bird can able to fly and also move forward. But bird can fly according to this paper hand calculations. Practically we have to test actual manufactured Bird. This forces also help to selection of the motor.

MPA011-Alternative energy sources-Bio-electricity and bio-fuel production using algae.

Avez.Shaikh, Nishant.Jadhav, Vijay.Mali, SE-Mechanical, VIIT Pune

Abstract- Biomass is a good choice of electricity and fuel. Algae are the most easily available source of biomass. It is a bioenergy technology with maximum efficiency with minimum cost. This process is combining the biomass production with efficient conversion to electrical energy and fuel. The system consists of Microbial fuel cell which produces bioelectricity from bacteria, Photo bioreactor for cultivation of algae, a harvest unit for collecting the algal biomass and then pressing it for extraction of oil which is further subjected to transesterfication process to get biodiesel. Also pond water biomass was used in microbial fuel cell (MFC) to produce electricity. Different sets of electrodes were used to get highest amount of current.
Key words- Microbial fuel cell (MFC), Electricity generation, Algae.

DEA012-Design and development of multi-purpose farming equipment

Manish Shetty, Pratik Thorat, Shivam Kulkarni, Vedant Jagtap, Dr. Dinesh N. Kamble, Professor, Mechanical Engineering, VIIT Pune

Abstract **-** Agriculture is one of the major occupations in India. Around 58% of the population is involved in agriculture and this sector accounts for 18% of GDP in India. The conventional farming techniques require a lot of human efforts, operational costs and time. According to census report, nearly 70% of Indian farms are small because of which small land holders cannot afford the expensive equipment and machines for different farming processes. So there is a need for equipment which can be used for performing multiple operations at a single time and should also be simple in design. The proposed equipment can perform various operations like ploughing, seeding, herbicides spraying etc. The main objective of sowing is to vary the depth of seed and row spacing. The height of sprayer mechanism can be also varied. It is made up of durable material and hence is affordable for effective handling by unskilled farmers. As day by day labour availability is decreasing, labour costs are increasing. This is becoming a big concern for farmers. The proposed machine can reduce the efforts. Also the maintenance cost and operational cost is reduced.

Keywords - Farming, Seed Sowing, Herbicide Spraying, Watering, Ploughing.

DEA015-Design, analysis and optimization of crankshaft assembly

Saurabh Bothikar, Soham Kulkarni, Akanksha Srivastava, Aditya Sawalkar, N.B.Kate, Professor, Mechanical Engineering, VIIT Pune

Abstract- Crankshaft is one of the most important moving parts in internal combustion engine. Crankshaft is a large component with a complex geometry in the engine, which converts the reciprocating displacement of the piston to a rotary motion with a four link mechanism. Since the crankshaft experiences a large number of load cycles during its service life, fatigue performance and durability of this component has to be considered in the design process. Design developments have always been an important issue in the crankshaft production industry in order to manufacture a less expensive component with the minimum weight possible, proper fatigue strength and other functional requirements. These improvements result in lighter and smaller engines with better fuel efficiency and higher power output. The linear displacement of an engine is not smooth; as the displacement is caused by the combustion chamber therefore the displacement has sudden shocks. The concept of using crankshaft is to change these sudden displacements to as smooth rotary output, which is the input to many devices such as generators, pumps and compressors. Crankshaft experiences large forces from gas combustion called Gas Force. This force is applied to the top of the piston and since the connecting rod connects the piston to the crankshaft, the force will be transmitted to the crankshaft. Crankshaft must be strong enough to take the downward force of the power stroke without excessive bending. So the reliability and life of the internal combustion engine depend on the strength of the crankshaft largely. We aim to perform finite element analysis to reduce weight of crankshaft and optimize cost. The material of the crankshaft is ASTM Carbon Steel En8D. Alternate materials for fatigue calculations are 42CrMo4 (alloy steel) and SAE1140 (carbon steel).

Key words- Crankshaft, Gas Force, Fatigue, Finite Element Analysis.

DEA016-Review on design and analysis of foldable stairs

Shraddha Mohite, Priyanka Rane, Botke, Mandhare,
Avinash Somatkar, Mechanical Engineering, VIIT Pune

ABSTRACT: Foldable stair that is easily deployed for use and folded for storage. It consists of a number of identical deployable scissor-like elements which form the staircases when expanded. In addition to use, the folded stair can be used for hanging clothes and acting as a decoration. The mechanism of the stair is first synthesized in line with the common stairs between two horizontal levels. The actuating mechanism is then synthesized in accordance with two extreme positions of the stair, folded, and unfolded. Because the stair can be folded after use, it is convenient in use and will witness a wide application both indoors and outdoors where there is no enough space for a fixed stair. In addition, this deployable stair is also particularly useful in evacuating people from a building when the disasters such as earthquakes occur.
Key words- Scissor like Elements, Deployable Structures

DEA019-Design and optimization of power axle system using finite element method

*Pravin Rathod, PDA College of Engineering, Kalburgi, Karnataka***.**

Abstract- Power axle is the critical member in the functioning of trains. Power axle gets its drive from traction motors and is subjected to live and dead loads of train engine. From the literature it is observed that majority of failures are due to axle failures and causing derailment of the trains. Also Radius relief and Radius run out are the main zones of failure. A Finite element analysis is carried out to improve the structural safety of the power axle. The analysis is carried out based on EN 13104 standards. Initially loads coming on the power axle are calculated based on the given inputs. Later the axle geometry is modelled using CATIA and analysed for structural loads using ANSYS. The results show high stress concentration in the fillet regions. Hence design optimization process is carried out to distribute the stress evenly across the geometry. This process is carried out considering the fillets at the radius relief and run out regions as the design variables, deflection as state variable and stress as the objective function. Sub-problem method is used to optimize the fillet regions specifying the convergence requirements. The design optimization process shows uniform distribution of stress across both radius relief and run-out regions and reducing the stress from initial 139MPa to 128MPa for the optimized set.

MPA001-Effect of Process Parameters on the Uniformity of Drawn Square Component

P. M. Yerolkar, PG Student, C. S. Choudhari, Mechanical Engineering, AISSMS, COE, Pune

Abstract- Sheet metal forming has been extensively used in manufacturing domestic and industrial products. There is a great demand to produce reliable product with lower weight, higher strength high strength, low density, and corrosion resistible. These necessities will increase trend of wrinkling & other failure defects in the product. So knowledge of process is require i.e. material characteristics, machine parameters, the work piece geometry that has to be manufactured, process parameters as material thickness, work hardening coefficient , plastic strain ratio , blank size and shape, draw ratio, lubricant and friction condition, blank holder force, and forming/punch load, to produce with minimum defects.

Keywords- Deep drawing, Process parameters, Square cup, Wrinkling

MPA002-A Review on Friction Stir Welding of Aluminium Alloy 6063.

Abnish Yadav, Aniket Gaikwad,
Parag Borse, M. G. Gadge, Assistant Professor, Mechanical Engineering, VIIT Pune

Abstract- Solid state welding process in which work materials are to be joined are heated approximately up to solidus temperature with the continuous pressure to form the complete weld joint. Since the technique of solid state joining of aluminium alloy was invented in 1991 by Wayne Thomas at TWI (The Welding Institute) as Friction Stir Welding process, it offers numerous benefits in the fabrication of aluminium products. FSW has become a major joining process which is widely used in aerospace, fuel tanks, pressure containers and marine industries as it is energy efficient, environment friendly and versatile joining process. Comparison of various FSW parameters like strength, tool rotation, transverse speed, feed rate, plunge depth and tool geometry are made. The aim of this study is to investigate the effect of various process parameters on microstructure, weld strength and mechanical properties of welding joints in AA6063 material.

MPA003-Effect of Shot Peening on Fatigue Life

Nishtha Shedolkar, A.R.Deshpande, Professor, Mechanical Engineering, VIIT Pune

Abstract- Shot Peening is a method of cold working in which the compressive stresses are induced by the impingement of shots in the exposed layers of the metallic parts directed at the metal with a high velocity under some controlled conditions. The shot peening process operates by the mechanism of plasticity where each particle directs as a shot-peen or hammer by the balls. The process of shot peening can be carried out on various materials like stainless steel, mild steel, aluminum, etc. In this paper, the study of shot peening, its mechanism and its effect on fatigue strength is studied on aluminum material. It is used to improve the fatigue properties of the part by introducing on the surface and in small layer underneath beneficial compressive stresses which retards or sometimes prevents fatigue cracking. The thickness of layer with compressive residual stress is strongly influenced by shot peening intensity.

MPA004-Mini Tractor as a Weed Remover

Dipak Rakshe, Shailesh Sah, Parvez Patel, Shrey Shekhar, Dr. A. D. Kale, VIIT Pune

Abstract- In today's world everything is getting modernized. Agriculture fields are slowly destroying and these lands are used for some other purpose. This is because the income from agriculture is less although the work involved is high. Most of the field work is done manually and so the farmers depend on the field workers for doing it. Because of the higher pay offered in other sectors like construction, workers prefer those jobs and so agricultural sector takes shortfall of manpower. This being the scenario, workers are not available for the works such as plucking out the unwanted grass and weeds growing in between the plants. It is very important to pluck out the grass and weeds in order to obtain fruitful results from the cultivation, as the grasses and weeds observe a part of nutrition given to the plants. Given the present situation, removing weeds becomes a costlier affair. In order to address this problem, this project proposes a simple, economical and efficient machine to remove the weed, which would be operated by a single person – savings of labour as well as time. The machine has been designed, fabricated and tested. Keywords- weeds, cultivation, labour, agriculture, etc.

MPA005-Experimental Verification & Investigation of Wear in Polymer based Composites

Ankita Sanke, Rucha Vanarase, Shravni Mahale, Avinash Sisodiya,
Dr. Atul P Kulkarni, VIIT Pune

Abstract - PTFE (Polytetrafluoroethylene) has low coefficient of friction and high thermal stability. Low coefficient of friction is a result of extended chain structure. Increasing the pressure to PTFE enhances to easily form the film layer and improves tribological behaviour. But, PTFE exhibits poor wear behaviour and abrasion resistance. To overcome these inferior low mechanical properties, the addition of filler materials such as glass, carbon, graphite fibre, etc. to PTFE can advance its wear resistance. This suggests PTFE fillers provide the wear resistance, lower coefficient of friction. The best working conditions for providing wear resistance and low coefficient of friction of polymer journal bearings is to be determined. The experimental work will be performed on Pin-on-disc Test Rig apparatus and analysed with the help of ANSYS software. The results of experiment will be presented in terms of graphs, tables and will be analysed.
Keywords – Polytetrafluoroethylene, fillers, wear resistance.

MPA006-Nylon thread manufacturing

Subodh Adake, F. Y. M.tech, Design Engineering

Abstract: Nylon is a generic designation for a family of synthetic polymers, based on aliphatic or semi-aromatic polyamides. Nylon is a thermoplastic silky material that can be melt-processed into fibres, films or shapes. Nylon is a tough material that is difficult to tear and exhibits excellent abrasion resistance. It can bend and will bounce back. It is not damaged by oils, solvents or alcohols. Nylon is not affected by fungi, moulds and mildew and is not eaten by insects. Nylon is the workhorse for many, many applications because of their excellent properties at low and reasonable price. Apparel accounts for a large share of usage of polyester and nylon fibre or as blends. Use in tyre cord fabrics, technical fabrics, stockings, hosiery, carpets, ropes are also expanding rapidly. Reason for choosing this project was the robust and wide applications of the polymer-based products, especially nylon which has been widely used in parachutes for military applications. Along with this the nylon has found its market in clothing as well. The nylon thread is basically manufactured using an extruder. Type of extrusion process was decided on the basis of the required nylon thread production rate. A screw type forward extrusion process was implemented in which a carrier screw was placed in a heat chamber where the nylon powder was melted and thus the melted material was extruded out of the die opening placed at the end of the extruder. In current design no control over temperature is obtained, this can be improved in future using PLC controller for temperature controlling. Further, a thread any desired diameter can be manufactured, the only limit over the thread size is the size of the die used at the end of the extruder. A larger die can be placed easily as the present die is installed by a threaded joint. Also use of mandrels can allow us to manufacture a hollow thread, if a metal wire feed is used instead of using a mandrel a well-insulated wire can be obtained.

MPA007-A review on hard facing process for increasing wear resistance

Samrudhi Shivkumar Kedari,
Mr .A. R. Deshpande, Professor, Mechanical Engineering, VIIT Pune

Abstract-Hardfacing is one of the most useful & economical way to improve the performance of component submitted to severe wear condition. Many industries face the problem of wear on components in service. Due to wear the components need replacement, which causes the downtime of equipment & increases its maintenance cost. Hardfacing is a process of deposition of a surface layer by welding. The economic success of hardfacing process depends on selective application of hardfacing material and chemical composition. It is found that the by varying the percentage of carbon and chromium corrosion and wear resistance can be enhanced. The main attention is focused on the influence of carbon and chromium variation on abrasive wear. In this paper, an attempt is to understand surface protection by hardfacing techniques and increasing in wear resistance by using these techniques.

Keywords-Hardfacing , wear resistance, hardfacing techniques.

MPA008-Antilock braking system in automobile, Its Advantages and Disadvantages

Ruturaj Chaudhari, Preshit Patil, TE-mechanical, VIIT Pune

Abstract- Antilock braking system most commonly known as ABS.it is implemented in a vehicle for a safety purpose. It reduces a breaking distance also it works on threshold breaking it helps when there is a severe or sudden breaking, the existing ABS controls have the ability to control and regulate the level of pressure to optimally maintain the wheel slip within the vehicle stability range. However, the ABS shows strong nonlinear characteristics for which the vehicle equipped with existing controllers have a tendency to over steer and become unstable. In this paper, the non-linear and time varying mathematical model of anti-lock braking system (ABS) is established. The proposed sliding mode controller is designed based on the slip ratio control technique, which makes the system state to lie on the sliding surface and improve the robustness of the sliding mode control system. The simulation results on a practical road surface prove that this strategy is appropriate and impressive, as it cuts-down the breaking distance and braking time in comparison with other existing braking mane over discussed in this paper. An extensive simulation study is carried out taking into account of the on/off control strategy, the conventional SMC strategy and the proposed SMC strategy. Further a comparative study is performed to judge the performance of the controllers.

Key words- ABS, slip ratio, SMC.

MPA009-Development of Forward-Reverse, Multi-Cylinder Ball Milling Machine for Energy. Storage Devices

Avez.A.F.Shaikh, Sarthak.S.Muttha, Yatharth.Maurya, Suraj.S.Yewale, TE Mechanical, VIIT Pune

***Abstract*—**Electrode material has to be crushed into smaller particles and that can be mostly done by ball milling machines. This grinding is done by conventional ball milling machine, jet ball milling machine, planetary ball milling machine and various other machines. But, these machines are expensive and they consume lot of power. Also swelling of electrode material also takes place in conventional ball milling machine. A ball milling machine named Forward Reverse motion, Multi-cylinder ball milling machine has been proposed. In this ball milling machine there are four cylinder so that more than one samples can be milled at a time and a new type of motion has been achieved. This motion is forward reverse motion that gives better results in comparison to conventional ball milling machine and that also in cheap cost.

***Keywords*-** *Milling, super capacitor, Nano particles.*

MPA010-Advanced Research on Automated Smart Bin.

Kartik Kulkarni, Avez Shaikh, SE-Mechanical, VIIT Pune

Abstract- Solid waste is the majority in our waste generation, so its disposal and proper management is top priority. Most of the societies in the India now have made it compulsory to segregate wet and dry waste, but you know how the average Indian citizen is – ignorant and so eagerly looking forward to breaking the rules. Many a times in our city we see that the garbage bins placed at public places are overloaded which creates unhygienic conditions for people and at the same time it creates great problem for its proper management and disposal. Also its segregation at primary level is difficult. So we came up with an innovative solution of above mentioned problem by creating some advancements in a traditional bin for efficient segregation and proper as well as timely disposal of solid waste. In this paper we have proposed a system which timely detects the type of waste i.e. dry or wet waste and segregates it, also it reduces the problem of overloading of bin and the whole system is runner by itself by some mechanism attached which generates electricity and runs the system or contemporary the system can also be runned by using solar panels.
Key words-Solar Panels, Electricity generation, Segregation, Smart Bin.

MPA012-Review on effect of foam fire extinguish system used in chemical industries for low temperature.

Pathan Shoaibkhan Zakirkhan, Mr. M. G. Gadge, VIIT PUNE

Abstract- Fire extinguishing foams are commonly used for extinguish fire (class A&B), i.e. textile, rubber, plastic, gasoline, petroleum, tanks, oils solvents & flammable liquids. The purpose of the current paper is to consider the various firefighting foam currently used in chemical industries as to compare various fire extinguishing system like ABC POWDER (class A,B and C) has limitations, risk during inhalation when using indoors, homes, domestic and commercial field to human beings. while using WATER MIST (class A,B,C,F) as a fire extinguisher is very effective, but it require heat to vaporize water mist ,complex piping configuration and less efficient in shield fire. It was found that as the foam application rate increases. The fire extinguishing and burn back protection performance of compressed air foams can be evidently improved as CAF can be applied in extinguishing oil tank and chemical industries. The most economical and efficient foam application rate on gasoline pool fire was 3.48L/ (min.m^2) and the minimum foam solution dosage to 90%control and entirely extinguish the fire were 0.99L/m^2 and 2.38L/m^2 respectively.
Keywords- **foam** fire extinguisher, compressed air foam

MPA013-3D Scanning Techniques: Application to 3D Scanning of Anti-Roll Bar

Sourabh Pandey, Omkar Jagtap, Vedant Sane, Shivam Kshirsagar, Manoj Jagdale, Professor, Mechanical Engineering, VIIT Pune

Abstract- 3D Scanning is a crucial step in the Reverse Engineering methodology. Following paper describes and analyzes various techniques of 3D Scanning. The paper concentrates on the 3D scanning of the Stabilizer Bar (also called as Anti-Roll Bar) which has considerably low volume and a complex three dimensional geometry. Many challenges which can be encountered while scanning such complex geometry are also analyzed and a better way is suggested. The paper initiates by elaboration and comprehensive analysis of various techniques and methods which are adopted to scan the objects in 3D Space. A detailed comparison is conducted to converge to 4 methods, namely Mechanical Probe method, Structured Light method (using Microsoft Kinect V1 sensor), Time of Flight method (using Microsoft Kinect V2 sensor), Time of Flight method (using Microsoft Kinect V2 sensor) Furthermore, this paper provides insights on some of the actual trials conducted using the above methods. The results obtained from the trials were analyzed. Based on the analysis, Microsoft Kinect Sensor V1 and V2 were adopted for scanning. 3D model generation of Anti-Roll bar using point cloud data generated from these sensors and their deviation analysis with respect to original designed 3D model is done in this paper. Optimizing and Interfacing these sensors with AutoCAD to generate 3D model of the Anti-Roll Bar using gesture control is also the topic of discussion here.

Key words-3D scanning, Anti-roll bar, Structured Light, Time of Flight, Microsoft Kinect

MPA014-Modernization of meteorological and air data compilation systems

Akshay Rajan Maggo, Dr. Dhanapal. A. Kamble, professor, VIIT Pune

Abstract - Nowadays very accurate meteorological data is gathered and analyzed into useful information by data scientists, such as calculating the crop water needs, planning and management of water resources or renewable energy sources, air quality control, road safety, traffic regulation. The data is progressively increasing day by day. As a result, we require the prerequisite form of data to predict the climatic and environmental changes to reduce the unnecessary losses. Various data compilation systems and models are built to perform operations on climatic database. In India the 'main Clisys system' is installed at IMD (Indian meteorological department). The techniques are to be upgraded at IMD to fulfill the upcoming and demanding requirements. Modernized methodologies are to be initiated for the needs of 21st century.

KEYWORDS – Data compilation, meteorological data.

MPA016-Applications of shape memory alloys: a review

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Abstract- Shape Memory Alloys (SMAs) have been on the forefront of research for the last several decades. They have been used for a wide variety of applications in various fields. SMAs have drawn significant attention and interest in recent years in a broad range of commercial applications, due to their unique and superior properties. Shape memory alloys, and in particular Nitinol alloys, are characterized by two unique behaviours, thermally or mechanically activated: the shape memory effect and pseudo-elastic effect. These behaviours, due to the peculiar crystallographic structure of the alloys, assure the recovery of the original shape even after large deformations and the maintenance of a constant applied force in correspondence of significant displacements. This work reviews the application of SMAs, especially Nitinol in various fields and the advances made in automotive, aerospace, robotic and biomedical sector.

MPA017-Industry 4.0- The upcoming industrial revolution of the century

Purvang Shah, Atul Kulkarni VIIT Pune

Abstract- The term Industry 4.0 stands for the fourth industrial revolution which is an automated and intelligent implementation of the manufacturing processes which is a need for today's industry. This new revolution brings together the Physical and the Digital world through the internet of things and this in turn enhances the industrial processes which have a greater impact on the economy, market, productivity and the production cycle. The term was first used in the 'Hannover Messe' (Fair) at Germany in the year 2011. The advancements in the IT industry had led to change in the way of communication, storing of data and interconnectivity among the devices. The industry 4.0 focuses on increasing flexibility, customizing mass production, improving quality and increasing productivity.

MPP019-Reducing Pollution and Adopting Better Health Using Hydrogen Fuel-Cell Vehicles

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Abstract- Hydrogen fuel-cell powered vehicles(HFCV) are attracting engineers and manufactures all over the world. The innovations are being done over it to a great extent. Using HFCV powered vehicles could improve overall air quality, health and climate significantly. Most of the benefit is obtained by eliminating harmful exhaust emissions from conventional vehicles with harmless vapour emission. Research on HFCVs are being done in many countries. Recent working project is done in India by some students in IIT Roorkee. Hydrogen is produced by steam reforming of natural gas, wind electrolysis or coal gasification. Wind and natural gas HFCVs are most efficient and benefits the climate most. Automobiles running on HFCs uses conversion of aluminum foil with water and air to create hydrogen.

MPP020-Wear Mechanism in Automobile Brake Materials and its Potential Environmental Impact

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Abstract- Jet engines mounted on a pilot's arms and back enable her/him to achieve flight, it takes a toll on her/his shoulder joint. The thrust provided by the jets can be high enough to demand intense work out hours from an individual. Hence, for the commercialization purposes, we view exoskeletons as the centerpiece of a novel travelling platform. Exoskeletons will enhance a jet pilot's capabilities, allowing him to be comfortably in control. Current limits of human shoulder joints will be greatly extended and the exoskeleton will provide efficient maneuverability, easement on the limbs, command over direction and optimized travel time. A python program is used to create experimental prototypes that will address, and possibly advance, the selection of proper combinations of jet engines on the pilots arms and back. The jet engines manufactured by JetCat (Virginia, USA) were considered for these virtual experiments. Technology is applied to nearly every facet of the exoskeleton to ensure that the jet engine thrust is efficiently utilized, but not at the expense of the pilot's muscle strength to avoid potential adversaries like fractures, dislocations or fatigue. This enables superior capabilities to the pilot such as achievable motion in all degrees of freedom and fatigue-less travel. Novel designs were drafted, analyzed, 3D printed, Aluminum fabricated and tested for this purpose. PLA 3D printing for the proof of concept was carried out. The first prototype of the design was fabricated using aluminum and was tested for load transfer and maneuverability. The second prototype of the design is the topologically optimized version of prototype 1. This was conceived by keeping in mind a worst case scenario free body diagram. The obtained results theoretically and experimentally function with successful outcomes thereby being capable enough to be reviewed for mass manufacturing.

Key words- Human-Propulsion , Control Surfaces , Jet-pack , Jet-Engines , Additive Manufacturing , Exoskeleton , Endurance , Optimization , Simulation Driven Design , Topology Optimization

MPP021-Failure of Storage Tank: A Review

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Abstract - Storage tanks are containers that hold liquids, compressed gases or mediums used for the short or long term storage of heat or cold. Oil storage tanks may lead to hazardous conditions like fire, explosion and similar forms of catastrophic failures resulting in economic, environmental and health loss. Most of the failures of oil storage tanks are due to perforation of rust from the inner surface of the tank. Few of the many causes are found to be as lightning, maintenance error, operational error, sabotage, equipment failure, static electricity, leak and line rupture, open flames, runaway reactions, etc. Hence, to avoid these failures by knowing their causes and studying their consequences, a review of different tank failures has been carried out. This will be helpful to prevent the economic, environmental and health loss to a great extent.

Message From Head Civil Engineering

It gives me immense pleasure to welcome you all to Vishwacon 2019 **"3rd National conference on Recent trends in Engineering and Technology"** on 8th -9th February'2019 in Civil Engineering department of Vishwakarma Institute of Information Technology, Pune. This year, we have included major thrust areas of research for this conference like **recent developments in Town planning with respect to smart city, Green construction materials and advances in construction techniques, Applications of Remote sensing and GIS in civil engineering , recent trends in structural engineering and concrete technology. Additionally research outcomes in new technologies, methods and techniques in civil engineering are always welcome . All in all** it is a good opportunity for all the participants to showcase their talent by sharing their knowledge, experience , research work under the broader umbrella of civil engineering in VIIT. I am sure that the ideas presented in the conference and outcome of the conference will be a step ahead to make a mark in the technological advancement.

On behalf of Civil Engineering department of VIIT, I thank all the authors for their response. I take this opportunity to thank all the committee members for their untiring efforts , reviewers and the session chairs who ensured quality work of manuscript of the conference. We appreciate the enthusiasm and hard work of student volunteers of CESA.

Dr. (Mrs). Pradnya Dixit
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		engineering, goa engineering college, Farmagudi goa – 403 401, psavoikar@gmail.com	
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Scon_01-identifying the critical parameters influencing the resistance to shear strength of concrete

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Abstract-a shear load is a force that tends to produce a sliding failure on a material along a plane that is parallel to the direction of the force. The problem of shear and diagonal tension in rc beam has been a major concern of engineers.many investigations into the shear problem that have been carried out have led to numerous empirical or semi-empirical formulae. These formulae usually agree quite well with the corresponding test result but not applicable for general use, as they pertain only one particular set of beams parameters and loading conditions and do not permit a rational study of the various would be ideal, but this would be very difficult to achieve due to the unknown effect of interaction of the large number of variables and also because the failure criterion of concrete is not fully known.

Test results have shown that shear strength of reinforced concrete beams without web reinforcement depends mainly on concrete strength, longitudinal steel ratio, shear span-to depth ratio, and effective depth. Of course, factors such as maximum aggregate size, diameter of the bars, and spacing of the flexural cracks show some minor contribution. A part or all of these primary factors are included in the existing shear strength prediction models, but the effects of these factors are estimated differently according to the models.

Recently, high-strength concrete has been increasingly used in practice. With the development of concrete technology and the introduction of super-plasticizers and silica fume, the compressive strength of concrete in the field of ready mixed concrete reached 100 mpa (14,300 psi) and higher. Since the mechanical properties of concrete are changed in high-strength concrete, are evaluation of the prediction model is necessary to reliably estimate the shear strength of beams made with high-strength concrete. Moreover, because of the wider range of concrete strength used, more accurate predictions of shear strength of reinforced concrete members are required.

The work reported in this report provides a rational and accurate equation for the prediction of shear strength of reinforced concrete beams without web reinforcement. The results show that the proposed equation predicts the existing experimental data more accurately than the other equations in this study.

The present work is limited to developing the equation to predict design shear strength of concrete without considering the web reinforcement in the beam. The developed equation are validated and compared with the available similar kind of equations available in the literature. The work is limited to conducting the experiments only on l shaped specimen of the concrete without having any longitudinal reinforcement.

Key words- shear strength, l-shaped beam.

Ewr_01-metacentric height and stability analysis

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Abstract- this paper presents the brief about model of determination of metacentric height and stability analysis of a ship model. The main aim of this is to make a model, to work out the metacentric height and stability analysis. An acrylic model of rectangular length and width having curved surface at the base with arrangement provided to insert weight of 2n each and check its sustainability. The structural property i. E. Stability plays an important role to make it float oven a sea, a river or any other water body across the world. Other characteristics governing the stability are also addressed. Metacentric heightapparatus is used to measure the initial static stability of a floating body. It is calculated as the distance between the centre of gravity of a ship and its metacentre. The unit consists of a small tank. Water is poured in it and a small ship model float over it .the ship model is provided with a horizontal guide bar, over which a small weight can be slided. Displacement of weight is measured with a scale. A pointer is attached at the centre of ship. When the weight slides, the ship tilt. The angle of tilt is measured by displacement of pointer & from then the metacentric height of ship can be studied.

Key words- ship stability, metacentric height

Ipm_01- study of construction & demolition waste

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Abstract-the management of construction waste is important today. Construction and demolition (c&d) waste generation and handling issues has focused to achieve economical projects. India is a developing country where the increasing waste material occupies more area of land, so there is a need of the management of waste material in india. The harmful effect of the waste material is on our general environment and on our health. This paper gives more importance of reduce, reuse and recycle means concept of 3r for the management of the waste material.

Scon_02- development in yield line Patterns for design of slab

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Abstract – there are many approaches to analyse and design the conventional slab system supported on four edges, but difficultyarises when support conditions or shape of the slab changes. Hence yield line analysis is a basic approach to analyse and designslab having such conditions. Two approaches are available for the calculation of the ultimate load-carrying capacity of areinforced concrete slab involving yield line theory. One is an energy method which uses the principle of virtual work and theother, an equilibrium method, studies the equilibrium of the various parts of the slab formed by the yield line. At present a yieldline study is being conducted for different cases such as, slab supported on three sides, slab supported on two adjacent sides, slabshaving opening, slabs having straight yield line patterns. Apart from these cases there could be other practical cases also such asslab supported on opposite edges, slab having parabolic yield lines due to difference in stiffness of supporting elements.therefore this study aims at analysing and designing such cases along with increasing the stiffness of supporting element toobtain equal distribution of load.
Key words – yield line, slab, modification, software.

Ewr_02- assessment of existing building using svagriha rating system

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***Abstract* -** the emergence of new large-scale developments and the growth of the older ones are bringing in complex changes to ecology, natural resources and environment at local, regional, and global scales.it is high time we pay heed to our planning practices and guidelines that are followed to plan our buildings and make them in such a way that they promote sustainable development with lesser impact on environment.there exist many green building rating systems at the international. Svagriha is one of the guidance-cum-rating system being developed for small stand-alone buildings like residences, commercial offices, hotels, dispensaries, schools etc. And/or set of buildings with a cumulative built-up area of 2500 sq.m or less.the aim of this study is to upgrade knowledge about green building and assessment of green building by svagriha rating system. The objectives of the work are to suggest recommendations to improve the operational effectiveness and integrated approach for green building involving initiatives, construction practices and materials. Methodology adopted involves data collection from local owners and analysis of the same. The study of the existing office cum residential building further makes recommendations by way of adopting various techniques and schemes in order to improve sustainability and achieve maximum points. Reuse of materials for the construction reduces impact on environment and promotes use of non-renewable resources. By adopting green practices, we can take maximum advantage of environmental performance. This paper reviews an overall assessment of green building and recommendation to score maximum points by using indian rating system- svagriha.

***Keywords* –**green building, svagriha

Ewr_04- new technologies, methods & techniques in civil engineering- hydraulic design of bridge with the help of mathematical modelling

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Abstract-hydraulic considerations in the bridge design comprises several aspects such as selection of site, determination of waterway, assessment of the scour for design of foundation of abutment and piers, design of guide banks and approach banks, protection works etc. Undermining of piers due to excessive scour could become a potential cause for bridge failure.so, it is necessary to work on mathematical modelling of a structure to reduce the structural damage caused due to natural calamities in future. This research paper highlights on design of a bridge on basis of hydraulic analysis i.e. Hydraulic designing of bridge using a one dimensional software hec-ras. Bridge construction requires careful planning and in depth study as no undue risk should be taken in its design and construction.the innovative technologies, such as this modelling system can give an insight about hydraulic behavior of bridge, and assist to plan infrastructure improvements, develop operational maintenance strategies.
Key words- mathematical modelling, hec-ras, hydraulic analysis

Ewr_03- coconut leaf ash as a futuristic green material

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Abstract- coconut leaf ash is finely divided residue resulting from the combustion of coconut leaf for domestic and agricultural purposes. It has the potential to be used as a pozzolanic material all over the world. The volume of fly ash producible is millions of tons per year. Most of the the fly ash is unutilized in india and the remaining world. Instead of wasting, it can be utilized in a major way. Portland cement (pc) concrete is the most commonly used construction material. Portland cement has major drawbacks with respect to sustainability. The production of every ton of pc requires about 1.5 tones of raw materials. At the same time, during the production, it releases about one ton of carbon dioxide (co2) into the environment. Therefore, the reduction of pc is extremely important. In this discussion it would be fascinating to discuss the utility of coconut leaf ash(cla) from the point of concrete making. Cla has been used for thousands of years by saraswat engineers in making traditional goansarswat bunds found extensively in goa. This paper deals with study of cla in construction with partial replacement of cement and providing eco-friendly construction material for a sustainable future.
Key words- eco-friendly material, fly ash, sustainable development, partial replacement

Ewr_05- comparative study of cartosat, aster and srtm dems for upper krishna sub-basin us-ing open source GIS

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Abstract- in last few years, digital elevation models (dems) have established more popular due to their diverse utility and applications in the fields like hydrology, forestry, precision farming, geomorphology etc. Dem is used for characterizing the topography and to derive the stream network, ridge line, thereby to study the landscape within the watershed area. Dems from satellite imageries like aster, srtm, cartosat etc. Are becoming popular with wide applications. The following resolution are allowed for comparison are as follows dem of isro (30m), advanced spaceborne thermal emission and reflection radiometer (aster) global digital elevation model (30m) and srtm (90m and 30m). These dems were created using different methods and technologies, and they can differ in howthey represent the topography of the same area. This study shows that the differences in these dems and illustrates how these differences can produce various analytical outcomes when used to study local problems. The primary objective of this study is to compare the accuracy of dem generated from two different satellite sources, 1) optical based sensory satellite data – cartosat-dem. 2) microwave based sensory satellite data – srtm-dem and 3) aster-dem. In the present study upper krishna sub basin is selected for the comparative analysis of dem on the basis of the drainage pattern as a basic parameter. In this study area varied topography is observed as hilly region on the west while flat on the east. This study has been carried out in open source environment viz. Qgis was conducted using open source geographic information system (gis).

Ewr_06- dam break analysis using hec-ras

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Abstract-dams are beneficial for society but flood occurs due failure of dam is dangerous for lives, properties and environment. Prediction of dam break flows is necessary for forecasting and evaluation of flooding disaster and preparation of an emergency action plan.it is possible to do dam break analysis using three different method, i.e., numerical method, modelling method and using software method. Out of these three methods, software method gives us precise and accurate solution. Hec-ras is used to analyse dam break. Hec-ras work on either energy equation or saint venant's equation for analysing model in 2d modelling method. This study will deal with analysis of 2 dams for dam break, i.e., khadakwasla dam and panshet dam. Then we are able to work on flow parameters velocity, depth and discharge. We will get these parameters at each and every point as the literature says. Means in all we can predict these parameters to protect the life of people. Also, we can protect farms, crops from the upcoming flood.

Keyword-dam break analysis, hec-ras,

Scon_04- design and analysis of middle weight concrete by using eps beads

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Abstract- with increase in demand for construction materials, man has improved a lot in construction techniques of structures. In earlier ages structures were constructed with heavy materials, but in this modern era of construction old techniques are being more costly due to heavy loading. So the uses of lightweight materials are started. The expanded polystyrene beads are the material which substitutes in the place of coarse aggregate. The main objective of this investigation is to find a concrete mix proportion which gives better results than the burnt brick (compressive strength and density), and to study the properties, such as density, compressive strength and splitting tensile strength of lightweight expanded polystyrene (eps) beads concrete. Then its properties are compared with
M20 grade conventional concrete.

Keywords: expanded polystyrene beads (eps); density; compressive strength; splitting tensile strength

Scon_03- evaluation of the performance of geopolymer mortar

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***Abstract*-**mortar is a basic ingredient of masonry which helps in binding together the masonry units. The strength and elastic properties of masonry are not only dependent on the properties of constituent but also on the intricate interaction between the units and the mortar. Thus, any study related to the performance of masonry should not exclude studies on mortar. There are quite a good number of mortars which are commonly used and possess relative advantages and disadvantages. These conventional mortars are generally 10-15mm in thickness. Since these conventional mortars constitute to 7% - 25% of gross volume of masonry, recently there are manufacturers who have come out with alternative “geopolymer mortar”. This can be made from alkaline solutions. In this dissertation an attempt has been made to study the strength and elastic properties of a geopolymer mortar. Geopolymer, an inorganic alumina silicate polymer is synthesized predominantly from silicon and aluminium materials or from by product materials like fly ash. The application of geopolymer technology substantially reduces the co_2 emissions by the cement industries and utilizes the solid waste materials such as fly ash. The fresh geopolymer mortar has stiff consistency and high viscosity. Further, the chemical reaction is fast. To evaluate the performance of geopolymer bricks, the tests namely compressive strength, split tensile strength and flexural strength are conducted. The study includes geopolymer mortar with different molarities 4m, 8m, and 12m. For each molarities 3 mortar cubes have been casted of size 70.6mm x 70.6mm x 70.6mm and briquette moulds and beams with using fly ash as binding material and fly ash has been replaced with 10%,20%,30% of ground granulated blast furnace slag.1:3 proportion of fly ash to sand ratio has been maintained.

Ipm_02- optimization techniques in civilengineering

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Abstract- engineers analysts and managers are often faced with challenge of making tradeoffs between different factors inorder to achieve desirable outcomes. Optimization is the process of selecting these tradeoffs in the "best possible way". Therefore; in an optimization problem, different candidate solutions are compared and contrasted so as to achieve the solution of the highest quality. The main concern in a project are time and cost which increases need of cost reduction techniques. To increase the productivity and reduce cost of project different techniques like assignment model, transportation problem, genetic algorithm, bee colony optimization, queuing theory are applied mainly in supply chainmanagement of civil engineering. In this approach, we have studied application of optimization in civil engineering. Also, we have discussed various cost optimization techniques.

Key words- optimization, cost, time, assignment problem, transportation problem, queuing theory, bee colony

Scon_05- partial replacement of coarse aggregate by waste ceramic tiles in concrete

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Abstract-due to the day to day innovations and development in construction field, the use of natural aggregates is increased tremendously and at the same time, the production of solid wastes from the demolitions of constructions is also quite high. Because of these reasons the reuses of demolished constructional wastes like ceramic tile came into the picture to reduce the solid waste and to reduce the scarcity of natural aggregates for making concrete. The ceramic tile waste is not only occurring from the demolition of structures but also from the manufacturing unit. Studies show that about 20-30% of material prepared in the tile manufacturing plants are transforming into waste. This waste material should have to be reused in order to deal with the limited resource of natural aggregate and to reduce the construction wastes. Crushed waste ceramic tiles is used as a replacement to the coarse aggregates. The ceramic waste crushed tiles were partially replaced in place of coarse aggregates by 10%, 20% and 30%. M30 grade of concrete was designed and tested. The mix design for different types of mixes were prepared by replacing the coarse aggregates. Experimental investigations like workability, compressive strength test, split tensile strength test, flexural strength test for different concrete mixes with different percentages of waste crushed tiles after 7, 14 and 28 days curing period has done. The strength of concrete also increases with the ceramic coarse tile aggregate up to 30% percentage.
Key words-crushed tiles, compressive strength, flexural strength, split tensile strength.

Ipm_03- review on
Filtering capacity of porous asphalt pavement

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Abstract- in today's scenario there is a huge need of water conservation for drinking as well as daily purpose. So, we can conserve water in ecofriendly manner by using different techniques such as porous asphalt pavement. This paper reviews the efficiency of porous asphalt pavement with respect to their capacity to filter rainwater. The study was carried out in two phases, first phase we have collected data from various sources such as rainfall directly from sky, storm water runoff. Second phase related with the various laboratory tests on collected water. Two slab samples of porous asphalt pavement were made according to morth (ministry of road transport and highway) and irc 37. Out of both slab pavement one was with geotextiles material and another one was a normal slab pavement. As non-woven geotextiles was used for this pavement the filtration capacity was increased and the prior purpose of use of geotextiles was served. The slab pavement which was tested shows the ability of good filtration from storm water as well as rainwater. Hence to recharge ground water table and non-potable uses in the buildings this porous asphalt pavements can be used.

Scon_06- strength characteristics of self compacting self curing by usingpeg

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Abstract- self-compacting is a new-fangled concrete that flows under its own weight devoid of any vibration and doesn't segregate and spreads effortlessly even in dense reinforcements. Self-curing is a new research practice, which is aimed to supply water for more effective hydration of cement to attain the strength and in situations to overcome the effect of poor workmanship in constructions. Water soon is going to turn out to be a scarce material day-by-day; there is a vital necessity to research in cut of water for production of concrete and curing. Curing of concrete is upholding appropriate dampness in concrete throughout its primary segment in order to get better strength and durability attributes. Conception of self compacting-self curing concrete [scscc] is to eradicate compaction for concrete also upholding sufficient dampness for curing purpose. Efforts are made to acquire scscc by] and peg as internal curing agents. Strength stricture like compressive', and splitting tensile' strength deliberated for diverse percentages of self-curing agen) both partially cured and self cured concrete and (0.1%, 0.2%, 0.3%, weight of cement for peg) and from the outcomes, results show that peg it is possible to successfully utilize curing agents in scc to achieve the required strength.
Key words- scc, scscc, lwa, peg

Ewr_07- studyof aerodynamicstyling

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Abstract:withthedevelopmentofautomotiveindustry,moreandmorenewvehicles are broughtout. Thisresultsinmoreandmorestylistsandengineerstakingpartinvehiclestylingtodesign newvehicles.intheprocessofvehiclestyling,aerodynamicsisanimportantparameterto judgeitsperformance. Especially formoreexcellenthandlingandstability performance, more aerodynamic analysisand optimizationshould been done. Theprojectaim isstudyingtheaerodynamicsof2differentvehiclesby testingtheir geometricallysimilar models in the wind tunnel fordifferent wind velocities. Thewindtunneltestisoneofthebestmodernwaysofaerodynamicdesignwhichapply inthefieldsofaerodynamicresearchwidely.by testingthevehiclesinthewindtunnel aerodynamicdragcoefficient,velocity contourandpressuredistributionwerecalculated. Thisgavean overall pictureofthevehicleswithrespecttothedragexperienced by them which in turn results in fuel efficiency.

Key words- aerodynamics, vehicle efficiency

Scon_07- study of carbon dioxide infused concrete

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Abstract-concrete is the most extensively used construction material in the world. But it is also responsible for the roughly 7% of the world's green house gas emission. One of the recent technologies uses infused carbon dioxide (co2) in concrete during its fresh state. Infusion of co2 in fresh state produces well dispersed nano-size calcium carbonate minerals, which actually make concrete stronger. This study explore some chemical behavior of co2 infused cement mortar (c.m.) as possible pre-requisite for study on cement concrete with varying dosage of co2 for beneficial utilization of co2 in concrete. The feasibility of using co2 at the time preparing c.m. was investigated. Co2 tablets available in the market were used for the study. Compressive strength of c.m. cubes was found out at 14 days and compared with the batch without co2. The comparison between the reference batch and batch with co2 indicated that there was increase in compressive strength of c.m. by about 29%. This may be attributed to infusion of co2 in c.m. for deciding optimal dosage of co2 in c.m. varying dosages of co2 from 3.41g to 20.46 g were used. Based on the tests it was found that there is increase in the compressive strength for the initial dosages but further increase in co2 the compressive strength decreased.

Key words-carbon dioxide, cement concrete, compressive strength, cement mortar.

Scon_08- fracture energy in fibre Reinforced concrete

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Abstract-a linear elastic fracture mechanics (lefm) based model is presented to determine the fracture energy (gf) and crackpropagation resistance of fibre reinforced concrete. Fiber reinforced polymers (frp) materials are now used extensively forstrengthening of existing structures. Carbon fibres and carbon fibre reinforced polymer sheets with mode-i crack propagationare proposed in the model. In proposed model the fracture zone in front of the pre-determined crack, a notch represented as afictitious crack that is able to transfer stresses. Rilem tc-50 common method to determine gf is used and in addition twoparameter model based on mode-i analytical expression is also used in the results of three point bent test to determine gf.different notch to depth ratios beams are used to calibrate the gf. Various other fracture parameters have also been studied byvalidating with existing studies on m30 grade of concrete. The present study is aimed at determination of gf using abaqussoftware for frp layered beam and comparing with conventional theory.
Key words: fracture energy, crack, fibre reinforced polymers

Scon_09- dynamic analysis of building frames with and without infill walls

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Abstract- the determination of the fundamental period of vibration of a structure is essential to earthquake design. Currentbis code equations (is 1893 (part1): 2016) provide formulae for the approximate period of earthquake-resistant buildingsystems, which are dependent only on the height of the structure and base dimension of building. Such a formulation isoverly conservative and unable to account for structures with geometric irregularities. Although many researchers haveattempted modification in the formulae with an aim of predicting the period of vibration as close to the reality, this studyevaluates empirical equations provided in the current building codes for the calculation of fundamental periods of vibrationsand recommend possible improvements. In this study, analytical software etabs is used to estimate the period of vibration,base shear force and top floor displacement.the total of 60 rcc building frames, all shear wall dominant symmetric buildings are analyzed with etabs v.9.5.1. Out ofwhich 30 models are bare-frame structures and 30 models are provided with masonry infill panels. The fundamentalperiods based on vibration theory for each example are compared with estimated values by these techniques includingcurrent code equations as well as equations proposed in recent literature. Variation in fundamental period of vibration,base shear force, and lateral displacement, are summarized with respect to height and provision on infill panels. Relationbetween time period and height of structure are computed and most efficient equation for fundamental period of vibrationis suggested.
Keywords- fundamental period, frames, equations, panels, shear force, height of structure, vibrations, analysis.

Scon_10- some aspects of computational modelling ofgranular soils

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Abstract- in this paper, some computational and analytical aspects related to modelling of granular geomaterials arepresented. As sand shows dilative behaviour when sheared, simple constitutive models based onconventional elastic theories for solid materials are not valid and hence, special models have beendeveloped. In order to exemplify the complexities in modelling geomaterials, salient features of themechanicalbehaviour of soils are presented. However, proper care must be exercised in the selection of theappropriate soil model to capture the physics of the problem at hand. On the other hand, once theconstitutive model is finalized, the appropriate computational formulation must be adoptedto adequatelysimulate the problem at hand. In this context, finite element method (fem), discrete element method(dem) and the material point method (mpm) as applied to granular mechanics is briefly discussed andreferences are provided for detailed study in these areas.
Key words- constitutive modelling, granular, sand, finite element method, discrete element method, material point method.

Scon_11-effect of calcium carbide residue – fly ash on properties of concrete

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Abstract: the utilization of waste materials (ccr) by-product is a partial solution to environmental and ecological problems. Use of these materials not only helps in getting them utilized in concrete and other construction materials, it also helps in reducing the cost of concrete manufacturing, but also has numerous indirect benefits such as reduction in land-fill cost, saving in energy, and protecting the environment from pollution effects.this paper reviews the innovative ideas with maintaining the economical and practical considerations. Basically the main topic is the partial replacements of cement in conventional concrete. Materials selected for replacement are calcium carbide residue (ccr) and fly-ash (class f). It can be effectively used in concrete to replace cement. Ccr is the waste obtaining from acetylene gas industry and fly-ash is the waste material obtaining from burning of coal in various industries like thermal power plant. As a part of preliminary work the material required for concrete work was identified, like cement, fly- ash, ccr, fa, ca. And the initial tests was carried out for material specification. Concrete mix design was carried out as per is10262-2017 (is code method). Initially conventional concrete cube was casted without mixing ccr and fly-ash and tested after 7 days, 14 days, and 28 days of curing. By adding the ccr by replacing of cementitious material with varying proportions the quantity of fly ash was kept constant to ease the compaction process. The preliminary investigation shows the cement can be partially replaced with the by-product of acytelene gas.

Scon_12-experimental study using maturity meter

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Abstract- maturity of concrete is the extent of cement hydration measured by calculating temperature history of hydration. Thematurity of concrete helps in understanding the compressive strength of concrete without breaking. It is a non-destructive testand can be very helpful on site to save time as well as little quantity of concrete which is used for the conventional method oftesting the strength. Maturity meter is a device used to measure the maturity of concrete and calculate the strength. The device isvery small and is wireless. The device can be used at any site and is very easy to use. Maturity meter helps to increase the work rate on site. This study will explore the working of maturity meter along with introduction and the sample result will be included which willgive a basic idea on how a maturity meter works and handled. In the future there will be enough research and advantages of thematurity meter. The graph included in the study is the result of the experiment carried out at the lab using concrete of grade m30.
Key words- temperature, time, hydration, etc.

Ewr_08-defluoridation of drinking water availablemethods and emerging technologies - a focusedreview

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Abstract –deflouridation is the only practicable option to overcome the problem of excessive fluoride in drinking water, wherealternative source is not available. During the years following the discovery of fluoride as the cause of fluorosis, extensiveresearch has been done on various methods for removal of fluoride from water. This study reviews and discusses the recentdevelopments of affordable methods dealing with removal of fluoride from drinking water. To this end, the current state of thevarious processes used for defluoridation has been briefly reviewed. The critical assessment of various available technologies forthe removal of fluoride reveals that, among various available technologies, electrolytic defluoridation appears to be a promisingalternative for the treatment.
Key words - electrolytic defluoridation, electro coagulation reactor, physico chemical treatmentmethods, cost effectiveeconomic.

Ipm_04-a review on flexural behaviour of bituminous mix usingmicro materials for flexible pavement.

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Abstract - bitumen is an organic mixture composed of various chemical compounds having good viscoelastic properties, sobitumen has been widely used as a binder in the construction of highways and runways for a long time. When exposed toheat, oxygen, and ultraviolet (uv) light the physical properties and chemical structures of bitumen will changes called aging.in all or some of the layers in the pavement structure due to consequence of increased tire pressures and axle loads, whichsubjects the surfacing layer nearest to the tire-pavement contact area to increased stresses the rutting phenomena alsoincreases. Thus this study focuses on the permanent deformation of properties of mixes. The service life of bituminousmixtures decreases due to heavy traffic and environmental conditions. Thus, pavement researchers are constantly trying toimprove these conditions, such as reducing the incidence rate of damages in the roads and delay the incidence time as muchas possible. The use of micro particles in bituminous mixtures to improve performance related properties have gained apopularity in recent years. Extremely large interface area with binder matrix is the most important feature of these microparticles which translates in a higher degree of changes in the microstructure of flexible pavement. This technology is thecreation of new materials, devices, and systems at the molecular level as phenomena associated with atomic and molecularinteractions strongly influence macroscopic material properties. In this study a forward investigation of micro titanium oxideon the physical properties such as penetration, softening, and viscosity then studying its effect on the mechanical propertiesof marshal specimen with locally available average quality aggregates and bitumen.

Key words – bitumen, bituminous mixture, titanium dioxide (tio2), nano silica (sio2), carbon nano tubes (cnt).

Scon_13-review of literature related to j-ring apparatus used for self-compacting concrete.

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Abstract- passing ability (pa) of self - compacting concrete (scc) is one of the most important tests with reference to workability. It is commonly determined using the j-ring (jr) apparatus by measuring either the jr value or the (astmjr) value. Both these tests indirectly measure the pa. The j-ring value is the difference in heights of scc inside and outside the jr, whereas the astmjr value is the difference between the un-restricted and restricted slump flows. Although conventional jr test is a reliable method; it is cumbersome, time consuming and difficult to interpret. On the other hand astmjr test is simple but irrational and unreliable. Very few papers were found on this topic. They were reviewed and a modified j-ring (mjr) test and adjustable modified j-ring test (amjr) with suitable alterations in the conventional jr apparatus and testing procedure are proposed. Proposed tests could directly measure the pa of scc as the ratio of mass of concrete that has passed through the mjr and amjr to the total mass of concrete poured inside the apparatus. This could provide a more rational, meaningful and holistic evaluation of workability.
Key words- self-compacting concrete; passing ability; j-ring test; modified j-ring test; adjustable modified j-ring test, american society for testing and materials j-ring (astmjr)

Scon_14 - stabilization of black cotton soil using calcium carbide residue

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***Abstract*:** the constant increase in demand for land and the decrease in its availability has resulted in construction of various civil engineering structures being carried out on soft soil and weak soils. Construction on these types of soils has given rise to the development of various soil improvement techniques. Black cotton soil is spread over major parts of maharashtra, andhra pradesh, madhya pradesh, gujarat, karnataka, tamil nadu and some other parts of india and it covers more than twenty percent of total geographical area of india. It consists more than 60 to 70 percent of clay particles and 30 to 50 percent of montmorillonite which makes it prone to volumetric changes which is unfavorable from engineering considerations. Calcium carbide residue (ccr) is a waste product from acetylene gas factories which is rich is calcium hydroxide [$ca(oh)_2$]. This study emphasizes on finding the feasibility of using ccr as a chemical stabilizing agent in black cotton soil. The hydrated lime when mixed with soil and water reacts with silica present in the soil to form calcium silicate hydrate (csh) gel which has cementitious properties. Black cotton soil showing medium to high swelling potential from latur, maharashtra was used for this study. Changes in properties such as liquid limit, plastic limit, maximum dry density, optimum moisture content and unconfined compression strength were studied.

Ipm_05- a review on
Flexural behaviour of bituminous mix using micro materials for flexible pavement.

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Abstract **-**bitumen is an organic mixture composed of various chemical compounds having good viscoelastic properties, so bitumen has been widely used as a binder in the construction of highways and runways for a long time. When exposed to heat, oxygen, and ultraviolet (uv) light the physical properties and chemical structures of bitumen will changes called aging.in all or some of the layers in the pavement structure due to consequence of increased tire pressures and axle loads, which subjects the surfacing layer nearest to the tire-pavement contact area to increased stresses the rutting phenomena also increases.thus this study focuses on the permanent deformation of properties of mixes.the service life of bituminous mixtures decreases due to heavy traffic and environmental conditions. Thus, pavement researchers are constantly trying to improve these conditions, such as reducing the incidence rate of damages in the roads and delay the incidence time as much as possible. The use of micro particles in bituminous mixtures to improve performance related properties have gained a popularity in recent years. Extremely large interface area with binder matrix is the most important feature of these micro particles which translates in a higher degree of changes in the microstructure of flexible pavement.this technology is the creation of new materials, devices, and systems at the molecular level as phenomena associated with atomic and molecular interactions strongly influence macroscopic material properties. In this study a forward investigation of micro titanium oxide on the physical properties such as penetration, softening, and viscositythen studying its effect on the mechanical properties of marshal specimen with locally available average quality aggregates and bitumen.

Key words – bitumen, bituminous mixture, titanium dioxide.

Scon_15 application of maturity meter to thin members

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Abstract - thin members as structural elements are the most predominantly used in
Engineering, particularly in civil, mechanical, architectural, aeronautical, and marine engineering. Examples of the shell structures in civil and architectural engineering are large-span roofs, manholes covers, liquid-retaining structures and water tanks, containment shells of nuclear power plants, and concrete arch domes . Here we are going to work on square and circular thin members of standard size without reinforcement. Till now the extent of application of maturity meter is limited to get the compressive strength of beam column and slab. We are going to check its application to thin members and compare the results with with the conventionalmethods . For carrying out tests, material testing, casting of thin members as well as cubes ofstandard size will be done. During casting we are going to insert sensors in the thin elements at center and, at top and bottom near edges to study critical stress locations .comparing the result of cubes tests with maturity meter's readings will show us the variation . This extension of maturity meter's application will really helps in understanding :
1) how accurately maturity meter can gives us compressive strength in thin members.
2) enhancing scope of maturity meter's application in reinforced thin members and other
Structural elements.

Ewr_09 - increasing dissolved oxygen of water received from stp

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Abstract –We have designed an open channel in the open space left in stp, at the end of the process of sewage treatment with intermediate ogee weirs and ogee spillway as well. Hence we have created the artificial hydraulic jump.

Purpose or necessity of paper-we have surveyed various stps in pune city and we got to know that, the processed sewage water at the end of stp is used for construction as well as irrigation works. In both the cases when the treated wastewater would supplied to construction sites for curing or at rmcs and for irrigation the results of this particular water usage were found to be poor. Hence the efficiency of water was found to be poor. This efficiency is nothing but the quality of water. Along with the useful minerals in water the quality of water is nothing but the amount of dissolved oxygen (do) present in the water. Which is hence the efficiency of water. So we are increasing the do of processed wastewater from stp to increase its efficiency to make it more useful to react with cement and to nourish the crops, by using hydraulic jump.

Theory and method-when the water overtops the surface of weir or spillway due to overflow or surplus discharge and also for the small amount of discharge small weirs allow the flow of water to overtop the weir surface.it is purposefully done so as to produce hydraulic jump which creates the rigorous mixing of water.due to the rigorous mixing, water effectively interacts with air and produce great amount of dissolved oxygen.

Ewr_10 - menomonee valley stormwater park and Green infrastructure

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Abstract

Overthepast15yearsmenomoneevalleyhasundergonearemarkablerenaissance,transformedfromablightedandlargelyabandonedindustrialcorridorintoanincreasinglyvibrantcenterofindustry,entertainment,andrecreation.wherevacantanddilapidatedbuildingsoncestood–visiblefromthestate'sbusieststretchoffreeway–newbusinesseshavesproutedandnewinfrastructurehasbeendevelopedtoimproveconnectionsbetweenthevalleyandthesurroundingcommunity.meanwhile,anewpark,statetrail,andurbanecologycenterbranchhavecreatedenhancednaturalandrecreationalopportunitiesforarearesidents.whilestillaworkinprogress,themenomoneevalleyhasbecomeanationalmodelofsustainableurbanredevelopment.

Message from Head Electronics and Telecommunication Engineering

The development and inventions in technologies have changed the lifestyle of human being right from the Stone Age to present information technology era. Every new invention brought in new facilities and influenced the lifestyle. Recent inventions in electrical, electronics, computer and communication technologies have added new dimensions to everybody's life. It gives us immense pleasure to welcome you all for the **VISHWACON 2019**, 3rd National Conference on **"Recent Trends in Engineering and Technology".** The aim of the conference is to provide a chance for the students, working professionals and scientists around the world to portray their technical work and experimentations. The topics for the conference have been chosen based on thrust areas of research in academia and industry. Papers were invited on various aspects of electronics and telecommunication engineering such as embedded system and VLSI design, communication and networking, signal and image video processing, Instrumentation systems and power and renewable energy systems.

We thank all the authors for their response. We take the opportunity to thank committee members, reviewers and the session chairs who ensured high quality of manuscript of the conference. We appreciate the enthusiasm and hard work of student volunteers of IEEE students branch and EESA. We are sure that our conference will grow by leaps and bounds in the upcoming years!

Dr. S. V. Kulkarni

Head, Electronics and Telecommunication Engineering

Department of Electronics and Telecommunication Engineering

ET-EV-002 : Weather Monitoring System

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Abstract- In IOT enabled weather monitoring system project, Arduino Uno measures 6 weather parameters using respective 6 sensors. These sensors are temperature sensor, humidity sensor, light sensor, wind speed sensor ,UV sensor and rain level sensor. These 6 sensors are directly connected to Arduino Uno since it has inbuilt Analog to digital converter. Arduino calculates and displays these weather parameters on LCD display. Then it sends these parameters to Internet using IOT techniques. The process of sending data to the internet using Wi-Fi is repeated after constant time intervals. Then the user needs to visit a website to view this data. The project connects and stores the data on a web server. Thus user gets Live reporting of weather conditions. Internet connectivity or Internet connection with Wi-Fi is compulsory in this IOT weather monitoring project.

Key points- field crop; ARDUINO Uno; Real Time Weather Monitoring

ET-EV-003: Spine Posture Detection Device

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Abstract: Spine ailments are usually caused by incorrect postures espoused during daily activities. Once they emerge, medication is the first solution that helps to ease the pain. Then, a distinct rehabilitation plan, which consists of physical exercises and constant posture control, is undertaken with the goal of eliminating the spinal disorder. In general, these physical therapies last for long periods and the patient is inclined to go back the incorrect posture after a while.

The constant technological innovations in the area of sensing systems are fashioning new and better medical applications for various diseases or spinal disorders. Medical applications are not complete without a software or a method to process the data obtained from the hardware. Physicians and patients need to receive meaningful constraints from the system.

The purpose of this development is to present a mathematical model that can be used to practically reconstruct the posture of the human spine. By using orientation angles from a wearable monitoring system based on inertial sensors, the model calculates and represents the curvature of the spine. Numerous hypotheses are taken into deliberation to increase the model's precision. An approximation of the postures that can be calculated is also presented. A non-invasive solution to identify the human lumbar shape can help reducing the time needed for medical rehabilitation sessions. Moreover, it prevents future complications caused by poor posture.

ET-EV-004: Self Aligning Table (Sat) With Six Degrees Of Freedom

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Abstract: In several applications ranging from a laser wall for monitoring of intruders at international border to X-ray diffraction of a single crystal in a material science lab to precise alignment of high power femto-second lasers in a Tera Hertz lab, self-aligning tables (SATs) play an important role. In Mechanical industry, precise alignment in aerospace and automobile parts also uses SATs. The top plane of SAT is kept stable irrespective of the mechanical agitation of the complete SAT. The SAT platform consists of six legs that aligns the platform using lead screw mechanism which is operated by the stepper motor controlled using a microcontroller. It also examines its current position in six-axis using a position sensor and compares it with the reference position through feedback, using this the legs of the platform are adjusted to that position if there's a change in it. The Mechanical structure is already fabricated by the previous batch. We focus on the electronics aspect of the project i.e. Motor Driving and power handling, Alignment algorithm and Sensor Calibration of the platform, Power Supply aspects of the project. The major application intended for the SAT is to use the Stewart platform for alignment of laser wall to be used on borders.
Key words- SAT (Self Aligning Table), Stepper Motor, Stewart Platform, Six degree of freedom

ET-EV-005: Nutrition Analysis Of Soil For Agricultural Purpose

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Abstract:In country like India the economy is mainly based on agriculture, still we are not able to make optimal, profitable and sustainable use of our land resources. The main reason is the lack of knowledge regarding the soil analysis for the growth of crops. In every state around 9 to 10 lakhs soil samples have been received in laboratories and it is very difficult to test all the soil samples in time by the laboratories. By the time test reports are generated, harvesting is on the verge of completion. Hence there is a need for soil analysis to be made available to the farmer. The main objective of our work is to develop a testing system which can be used for soil analysis, which in term helps the farmers to cultivate and produce the proper crop. The system can be designed to tackle the problems faced on field daily and to provide the ease of operation. A robot attached with sensors can be designed to take readings of the soil sample and give the results accordingly. Nitrogen (N), Phosphorous (P), Potassium (K) contents of the soil are observed using an optical transducer by developing the same. Such transducer is needed to decide how much extra contents of these nutrients are to be added to the soil to increase fertility.

Key words- transducer, fertility, robot

ET-EV-006: Development Of Portable Tele Photo plethysmography

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Abstract: This paper gives a brief scenario regarding a Pulse oximetry is the non-invasive measurement of the oxygen saturation (SpO2). It is used for a rapid assessment of a patient's respiratory function to determine onset of hypoxemia (oxygen starvation) or COPD (Chronic obstructive pulmonary disease).One of the most important elements needed to sustain life is oxygen (O2) because it is used by cells to turn sugars into useable energy. Oxyhemoglobin (HbO2) is the protein hemoglobin, found in red blood cells, bounded to O2 that delivers 98% of oxygen to cells. The measurement and calculation of the percentage of HbO2 in arterial blood is known as oxygen saturation (SpO2). Originally, SpO2 was measured by taking samples of blood and measuring O2 levels directly. This method as an important measure of wellness until a non-invasive method of measuring it in real-time (pulse oximetry) was established. Healthy-Pi V3 is the first fully open-source, full featured vital sign monitor. Using the Raspberry Pi as its computing and display platform, the Healthy Pi addon HAT turns the Raspberry Pi into a vital sign monitoring system

Keywords: SPO2, Pulse-oximetry, Oxygenated Hemoglobin(HBO2),SPO2, Photo plethismography.

ET-EV-008: Car Health Monitoring System And Automation

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Abstract: Automation aims at making our lives simpler and smarter. Taking this idea of information automation in our vehicles, we need to be aware of the processes taking place in the vehicle. The idea is to collect the important data and inform the vehicle in our personalized smartphones through an application. The car automation system is a collection of data relevant to the present and future performance of a vehicle system and this information can be used to support operational decisions. In car automation we use ECU (engine control unit) to sense many parameters in cars and also control them. By using several ECUs in cars it improves the efficiency of the engine, reduction in requirement of fuel & overall it reduces expenses. Also, electronic control unit which is used to analyze and control many things such as door control unit, automatic windows control, fuel indicator, speedometer, odometer, headlight, wiper and much more.

Key Words-Electronic Control Unit, LINUX, Raspberry Pi, OBD-II, IOT.

ET-EV-010: High Resolution Timing Measurement Using Tdc For High Speed Photo Detectors On Fpga

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Abstract:Many time-of-flight (TOF) applications need measurement of time difference between two events. A Time to Digital converter is suitable for these kinds of applications because it measures time difference between two pulses and gives time difference as a digital output code. Commercial TDC's have limited readout time which is not suitable for high speed time measurement. This work aims at design and analysis of Time-to-Digital Converter (TDC) on low cost SPARTAN 6 Field Programmable Gate Array (FPGA) target which has a readout time of less than 12ns required for carrier life cycle measurement of semiconductors with LASER .The design objectives are to have resolution of 20 to 50 picoseconds and dynamic range varying up to few milliseconds .There are various TDC topologies available out of which Tapped delay lines are most suitable and efficient for implementation on FPGA meeting desired timing requirements. The delay elements in tapped delay line utilize the fastest path called the carry chain logic to obtain the high resolution. Two counters are used for measurement namely the fine and course counter in which the fine counter helps to evaluate the uncertainty that cannot be counted by the coarse counter.

Key words- TDC (Time to Digital converter), Tapped delay line, carry chain logic.

ET-EV-011: Development Of Embedded System For Monochromator

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Abstract:Spectrometer is instrument used to measure the properties of light over a specific portion of the electromagnetic spectrum. The basic need of spectrometer lies in the detailed study of absorption, transmission and reflection coefficients for analysis of any material/light source. Spectrometers to be used in harsh conditions like in satellites, chemical industry, etc. must be robust and compact in size. This project deals with the design and fabrication of portable, compact, low cost and robust spectrometer electronics on reconfigurable logic device i.e. on NUMATO board. The project is implemented in two stages viz. Analog Front End electronics for data acquisition and communication with PC for processing images and plotting the obtained spectrum in order to determine the purity of fluids and the concentration of elements in a given mixture or compound. Proposed system uses CCD based detectors that can convert charge to voltage at pixel by pixel. Fabrication using logic devices saves greatly on size, making it compact. With fabrication of this system and subsequent tests of different light sources it is observed that we can obtain spectra of UV source as well as visible source. The electronics of the spectrometer can be powered with a USB cable thereby reducing power consumption. This system gives us a resolution of 0.3nm which is better than Edmund optics UV Enhanced CCD Spectrometer. The dimensions of the system can be further reduced with the addition of a custom-made FPGA board.

Key words: Monochromator; FPGA; CCD; Analog Front End

ET-EV-014: Density Based Traffic Control And Automatic Emergency Vehicle Detection With Manual Traffic Signal Control Using Android Device

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Abstract: The Density Based Signal Management in traffic system is to clarify traffic congestion problem which is a big problem in many various modern cities, and many population face this problem. For that, in our project we designed the framework for dynamic traffic light control system, and the automatic traffic light control system, developed the model with codes to help build the system. In this system we propose dynamically time-based coordination schemes where a green signal time of the traffic lights is assigned base on the present conditions of vehicle density in that traffic. This system also has emergency vehicle detection module which detects incoming emergency vehicle in a lane and provides free path to it by immediately making the signal of that lane green. In third module of this system android device is used for manual traffic signal control using Bluetooth modem.

ET-EV-016: Implementation Of Low Cost And Effective Biogas Monitoring System For Household Applications

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Abstract: Biogas is fast becoming a valuable energy source due to the benefits associated with it like non-polluting and renewable energy resource. It is eco-friendly substitute for energy as it greatly contributes in reducing greenhouse gases emission. Monitoring of biogas plants is important to increase the production rate of biogas. It will help user to get overall information inside plant. User will take necessary action so that variation in any parameter will not affect the process stability. It helps to avoid severe financial consequences for biogas plant operator. Nowadays biogas monitoring and controlling systems are available for industrial applications which are very complex and expensive. These systems are not suitable for household biogas plants. As household biogas plants contribution to overall production is considerably large, there is need to develop an effective and low-cost system for monitoring of household biogas plant parameters. The proposed system includes monitoring of parameters such as methane content, pressure, temperature, pH of slurry and level of slurry. This information will be sent using Bluetooth to user as well as displayed on LCD. The objective of the project is to develop a method for improving efficiency of household biogas plant operation which will help in rural development.

Key words- biogas, renewable, greenhouse gases, monitoring, low-cost

ET-EV-017: IOT Based Bridge Health Monitoring System

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Abstract: The bridges over water bodies are subjected to constant deterioration due to high temperatures, heavy vehicular loads, earthquakes and floods.This has lead to devastating disasters such as loss of property, state economy and most importantly life. Recently Majehat bridge in Kolkata and Siliguri bridge in Darjeeling had collapsed due to heavy loads and dilapidated conditions. So constant real time monitoring of bridge structural health is required to sustain the already developed bridges to avoid any upcoming mishaps in future. In a country like India traditional methods such as human inspection and manual tools are used to monitor bridges. But this can be avoided by using the Internet of Things and Wireless Sensing Networks.The goal of this study was to develop a system which constantly monitors bridge health and then updates the concerned authorities regarding any defects due to environmental conditions via a mobile app. The system consists of ARM microprocessors, temperature, vibration and ultrasonic sensors along with RF modules. As a result extreme temperatures, shocks and vibrations along with rising water levels are sensed and transmitted via the RF module to a Control Unit. This is all processed in real time without human intervention. The required data would be sent to the app and corrective actions can be taken by the administrative officials.
Key words- Internet of Things, Wireless Sensing Networks, bridge structural heath

ET-EV-018: Insurance Telematics For Vehicles

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Abstract: Insurance telematics is a disruptive technology that is expected to reform the vehicle insurance industry. Based on sensor data, the traditional measures for calculating the insurance premium are complemented to determine a fee that more accurately predicts the risk profile of the policy-Holder. It is about consistently extracting relevant figures of merit. Figure-of-Merits (FoMs), telling the behavior of the car driver and the characteristics of the trip and risk profiling of the driver based on different sets of Integrity, Availability, and Continuity of Service. (FoMs) like speeding, CO and alcohol consumption, trip smoothness, etc., and then to transform these FoMs into a valid measure, or score, that determines the risk profile of the insurance Customer. According to this project when a vehicle encounter with an accident then the vibration sensor will identify the signal or if a car rotates over, and Micro electro mechanical system (MEMS) sensor will identify the signal and sends to Arduino. Arduino sends the alert SMS to GSM module including the location to the police control room and sending the SMS to the persons relative. Then once the location is confirmed necessary action will be taken.

ET-EV-019: Raspberry Pi Air Pollution Monitoring System Over IOT

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Abstract: In the present day, critical global issue is an air pollution .It impacts badly on the ecosystem, human and health. Thus, it is necessary to check air quality and keep it under control for a better and healthy globe. The research paper presents internet enabled air quality monitoring. Proposed system consist sensors to sense harmful gases, temperature, and humidity persistently and send-out results to Raspberry Pi. It also keeps monitoring air quality level and transfer it to the online cloud server. The sensors interfaced with Raspberry Pi for processing data and transmits over the IOT server. A simple LEDs are used to indicate exceed in hazardous gas level. This paper provides an economic IoT solution with Raspberry Pi for specified application. Keywords are IOT, air pollution, Raspberry Pi, MQ series sensor.

ET-EV-020: Accident Avoidance System Using Can Protocol

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Abstract: Now a day's technology uplift in passenger vehicle includes great safety measures, this technology advancement design considering risk involvement of human life. The passenger vehicle accident figure explored through world wide database is so huge, the on ground road accident shares the major part from the said figure. The primary remedies must be taken care of to avoid the major impact to this cause. This paper address the novel implementation of Smart Accidental Avoidance System (SAAS) based on the utilization of multisensory CAN network and Engine Control Unit (ECU). The successful implementation and investigation of SAAS shows the improved result against the older accident prevention system. The onboarding driver is always stayed alert without drowsiness and continuously guide throughout the travel. The latest Anti Braking System and Acceleration Skid System are synchronized with our SAAS to simplify the realization and improve the performance. The SAAS is implemented on higher abstract level to avoid the major modifications in the underlined hardware and cabling inside the passenger vehicles. The system is tested in live environment with all the real-time conditions, it shows the overall improved in system performance.

Key words: - Accident Avoidance System, Automotive CAN Bus, SAAS, Automotive safety, Close vehicle Sensing, Safe Autonomous Driving,

ET-EV-024: Automatic Weed Killing Robot

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Abstract: Comprehensive review of autonomous robotic weed control systems reported that systems for plant detection and their classification (crop vs. weed) conferred the best technical challenge for development of a victorious weeding mechanism. Methods for precision weed control also needed further development. Although the few fully autonomous robotic weeding systems that had been developed at the time showed promise for reducing hand labor and/or pesticide requirements, none had been successfully commercialized. Since then, technology has advanced and a number of other machine- driven weeding machines area unit commercially offered. This paper describes some of these devices and provides an update on the current state of robotic weeding. Commercial robotic weeding machines utilize one of several means to kill weeds including mechanical, flame or herbicidal spray. Classifying plants as either crop or weeds is difficult with system accuracy of around only 70%, even under ideal conditions. There are many ways to identify crop plants in digital images, but typically this is done by first analyzing a captured imaged and classifying each pixel in the image as being either a plant or a non-plant part using some type of green threshold technique.

Key words-Machine vision, Guidance System.

ET-EV-025: Design Of UART Using VHDL For Lock-In-Amplifier

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Abstract: The object of this paper is to design UART (Universal Asynchronous Receiver/Transmitter) to transmit and receive data using VHDL coding. UART uses only two wires to transmit data between devices. This paper presents hardware implementation of UART which is high speed and efficient using FPGA (Field Programmable Gate Array). The project presents design method of asynchronous UART implemented using Spartan-6 FPGA development board. The UART consist of 3 main components viz. transmitter, receiver and baud rate generator which is nothing but a frequency divider. A Lock-in-amplifier is use to remove noise from the input signal by using of reference signal. Obtained output is fed to UART and further can be processed on computer. The simulation outputs from UART are observed using Xilinx ISE. The controller is reconfigurable and scalable.

Key words- UART, Spartan-6, Xilinx, FPGA.

ET-EV-026: Predictive Maintenance Of Cnc Machine Using Internet Of Things (IOT)

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Abstract: Any equipment failure or unplanned down time will have an adverse effect on plant operation as necessary repairs, cost , time & money is required. Predictive maintenance (PDM) techniques are designed to determine the condition of in-service equipment in order to predict when maintenance should be performed. This approach promises cost and time savings over routine or time-based preventive maintenance, With this maximum efficiency can be attained, which increases production efficiency and profit gains and assuring safety environment for employees. The system consists of DAS(Data Acquisition System) which collect's all the data of sensors using a Raspberry pi board as a controller, it also has A built in Wifi so as to connect it to internet. We have analyzed some parameters for Predictive maintenance which are monitored and analyzed continuously as follows: spindle Vibration, coolant temperature, cabin temperature. We have developed a algorithm for continuous analysis of parameters which is capable to distinguish between a normal state and a faulty state that is a leading indicator of failure. This will further connect and communicate it's status using cloud based platforms which takes or schedules the required action. Cloud based software platforms which are built on latest advancement in big data technology can swiftly process this information and offer insights- a direct prerequisite for Predictive Maintenance.
Key words-CNC machine, IOT(Internet of Things), Predictive maintenance (PDM)

ET-EV-027: Feedback System For Motion Table (Alignment)

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Abstract: A Motion Table is a type of parallel robot that has six actuators, commonly hydraulic jacks or electric actuators, attached in pairs to three positions on the stable platform's baseplate, crossing over to three mounting points on a top plate. Devices placed on the top plate can be moved in the six degrees of freedom in which it is possible for move freely. These are the three linear movements x, y, z (lateral, longitudinal and vertical), and the three rotations pitch, roll, & yaw. The position and orientation of the end effector, the actuator coordinates, position are the main concepts uses in motion Table. Sensing these Elements using sensor, we can calculate the difference between actual and initial values of axis. This feedback given to input of system to carry the platform at initial Positions. The application of motion table is Stewart Platform, Flight and Car Simulation, Biomedical applications.

Key Words – 6 DOF, Yaw Pitch Roll, Alignment.

ET-EV-028: Development Of Electronic Visual Assistant E-Vision

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Abstract: - A method of providing a electronic visual assistant to an individual with low vision. The method comprises of obtaining the real time video footage of a scene using a camera carried by individual , transmitting the obtained video footage to the processor and then selecting an image modification to be applied to the video by the processor and displaying modified video on a display device worn by individual. The displaying of magnified image comprises of obtaining an image of a scene using a camera with greater resolution than the display, and capturing the image in the native resolution of the display by either grouping pixels together, or by capturing a smaller region of interest whose pixel resolution matches that of the display.

ET-EV-029: Slit Control Unit Of Particle Accelarator

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Abstract- The project is based on the construction and designing of the slit control unit which is a part of Electron Cyclotron Resonance Ion Accelerator. Electron cyclotron resonance (ECR) ion sources are well known to produce low-energy, highly charged ions. ECR ion sources are used to perform a wide variety of experiments involving collisions at low velocities probing the processes with low cross-sections. The slit control unit comprises mainly of microcontroller, stepper motor and TFT touchscreen display. The beam which is to be bombarded on the target (for ex: intrinsic germanium) should be of precise width. This width is varied by the movement of the slits which are controlled by the stepper motors. The rotational motion is converted into the linear motion which further moves the slits. With the total of 8 slits, the beam width is adjusted accordingly. The position of the slits is shown on the TFT touchscreen display. The speed and movement of the slits are controlled by the user through the touch screen.

ET-EV-030: Organic Waste Management

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Abstract- Waste management are the activities and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process. In some cases waste can pose a threat to human health. Waste management is intended to reduce adverse effects of waste on human health, the environment or aesthetics. Firstly we will be using a gas sensor, gsm module, Arduino board and sprinklers in the process. The organic waste generated from a society will be collected in 5 ditches made within its premises. An automatic sprinkle irrigation system will be put in place, complete with timers. Thus, the collected waste will be sprinkled with water and slurry culture twice a day to quicken the decomposition process.
When organic matter decomposes, methane is released in the atmosphere. These methane levels will be monitored and noted. When the compost is ready, the methane level will be noted and fed to the microcontroller. So that, when the methane levels reach the limit for the next ditch the GSM will be activated. It will send a message to the user that the fertilizer in the respective ditch is ready for use. Further, this fertilizer maybe used for the gardening requirements of the society or sold to farmers or other agents.

ET-PE-001: Improvement In Power Efficiency Using Vienna Rectifier

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Abstract: This project deals with operation of Vienna Rectifier in improving the power efficiency of 3 phase ideal rectifier. The aim of this project is to convert the AC input wave into a pure sinusoidal waveform. This will improve the power efficiency of the complete circuit. Generally, the Vienna rectifier is applied to many applications with high switching frequency such as a power supply for an electronic system, especially for telecommunication devices. However, in this project we are dealing with making of Vienna Rectifier and understanding its principle. IGBT switches are used to inject current backwards to the ideal phase, hence improving the AC current.

The idea behind is to enhance the pure diode rectifier and in this way extract more output power. Therefore, to investigate the performance of the Vienna rectifier and design it according to the project's requirements, several steps have been done.

Key words- power efficiency, 3-phase, IGBT switches, Injection of current.

ET-PE-002: Smart Power Assessment And Automatic Power Factor Correction System: Based On IOT

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Abstract: There is a real need for new energy sources as per growing technology and indefinable features, but we unintentionally do not think about it and wasting electrical energy in our day to day routine this is because of lag in the power factor of resistive, capacitive and inductive loads. Before going ahead into the power factor correction, the term power factor stated as how much energy provided has been utilized. The power factor is a relation between the actual electrical power that can be used in the electrical circuit and the power from multiplication result of voltage and current in that circuit or it is the angle difference between voltage and current. Ideally, the maximum value of power factor is unity or one. So the value of power factor of the load as close to one the load provides better utilization and lesser wastage of electrical energy. The active power has a useful role while reactive power is not much useful but, it used to develop the magnetic field required for devices.

Key words - Detection and correction of power factor, particle photon, IoT.

ET-PE-003: Design And Development Of Hybrid Mechanism For Electric Vehicle

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Abstract: The objective of this invention to develop and design hybrid mechanism for electric vehicle to increases the battery efficiency of an electric vehicle. It also enhances to provide noise less and emission less electric vehicle
It also aims to reduce the use of natural fuel and control the air pollution. The major feature of this EVs is that, drivers can plug them in to charging point from an off-board electric power source. This distinguishes them from hybrid electric vehicles, which supplement an internal combustion engine with battery power but cannot be plugged in.
It is a new type of vehicle which doesn't require any type of burning fuel. In this model we use different energy regeneration methods like regenerative braking system, solar system, piezo electric method, run time energy generation etc.

Fully electric and electric hybrid vehicles potentially introduce new types of post-crash hazards. It is also acknowledged that vehicles manufacturers have put considerable resources into developing safe and reliable electrical systems for the current generation of electric vehicles. A serious incident involving a lithium-ion car battery is considered to be highly unlikely but it is important that crash test organizations and rescue organizations understand and are prepared for the potential hazards.

Key words:- Regenerative braking system, Solar system, Piezo electric method, Run time energy generation, electric hybrid vehicles, off-board electric power source

ET-SI-001: AUTOMATED SOLDERING MACHINE BASED ON IMAGE PROCESSING

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Abstract:The purpose of this project is to study soldering techniques and develop an automated soldering machine. Discovering the new methods like image processing. yes, wave soldering is the best option but there are some drawbacks of it such as flux heating, high temperature, high cost and maintenance. So the purpose of this project is to reduce drawbacks of the wave soldering, minimize human efforts and human errors, to make a system fully automated. This Study will give you the detailed guidelines that how soldering of PCB can be done using image processing.

ET-SI-002: System For Identification And Maturity Prediction Of Fruits

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Abstract: This project deals with the issue of post-harvest process such as sorting and quality analysis of enormous amount of fruits manually, which is time consuming process. The ultimate aim of this project is to predict the maturity and life span of fruits by automation of post-harvest process. The datasets of fruit are created using a Digital Camera (Canon 3000D) from which a large set of fruit features describing various aspects of the fruits are proposed. The proposed features are extracted using MATLAB software through image processing. Further the efficiency of these features is verified by creating an Artificial Neural Network (ANN). The neural network is trained using a created database. After sufficient training, the neural network predicts the maturity and life span of fruits. Thus, in this project an efficient attempt to automate the post-harvest process to eliminate manual sorting and quality analysis.
Keywords: Maturity prediction, Life Span, Image Processing, Artificial Neural Network.

ET-SI-003: Michelson's Interferometer

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Abstract: Michelsons's Interferometer is an optical instrument which uses a beam splitter which has properties of partially reflecting and partially transmitting the light. The beam splitter, splits the light source into two paths. The setup of Michelson's interferometer has two mirrors M1 and M2 in which the one mirror is moving (suppose M1) and the other one is stationary (M2). The reflected beam from the beam splitter gets reflected back from mirror (M2) and the transmitted beam from gets reflected from mirror (M1) towards beam splitter and then these light rays combines and forms a interference pattern on the screen which has a photo detector or camera. On the screen, due to moving mirror M1 we get dark and bright fringes on the screen. In our project we are developing a triangular wave generator with required output impedance to move the mirror M1 with required frequency. The next part is the data acquisition part from the dark and bright fringes obtained on the screen, which can be then used to measure the wavelength of light, determine the difference between two wavelengths and many other applications can be developed. For determining the wavelength we need a monochromatic source of light.

Key Words – beam splitter, photo detector, camera

ET-SI-004: Non-Destructive System For Grading Of Fruits Based On Volume And Maturity

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Abstract: The project is meant to resolve the inefficiency of post-harvest procedure viz. testing maturity, sorting the fruits or vegetables based on quality and calculate their volume. The ultimatum of this project is to automate the whole post-har- vest system, so as to save enormous amount of time that is wasted when the procedure is done manually. Another pitfall of manual sorting and quality check is that it is inefficient, and hence there is need for automation. The proposed system has been made on PYTHON platform. Further to increase efficiency we use approximation to increase the speed of processing. The whole setup would work over a conveyor belt system which would help in segregation of fruits/vegetables. We have used Logitech C310 Webcams for image acquisition under artificial lighting for flawless results. Thus, the main aim of the project is to achieve speed as well as accuracy in the field of sorting and quality check in the field of post-harvesting.

Key words -volume, automation, python, webcams, artificial lightning, accuracy

ET-SI-005: Weed Detector And Manure Maker

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Abstract: The soul purpose of this paper is to introduce the system that detects weed and removes it using robotic arm. Weed management is necessary in agriculture field as they degrade the nutritional flow to the main crops. The weed detection algorithm consists of morphological feature extraction, image segmentation, excessive green conversion & threshold value estimation, area and perimeter estimation. The advanced algorithm is implemented for its ability to detect the difference between weeds and the crops under observation. The Agri-bot captures the images of the field in dynamic climate conditions. The defined image processing algorithm will execute automatically on the image captured without any human interference. The Morphological algorithm examined plants and identify the main crop and the weed. However, to faster the rate of processing that is much better efficiency. The matured weed detection and image processing algorithm gives a unique method for identifying the plants from the soil background under variable climate, and to differentiate weeds from the plants. At the end, according to the position of weed the robotic arm remove the weed without causing any effect to main crop. The whole advance algorithm is implemented in MATLAB version 18 software, which is more appropriate for real time on field purposes.

Key points- field crop; MATLAB (image processing); weed identification; Morphological features

ET-SI-006: Validation of 12 Lead Tele-ECG

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Abstract: Indians have one of the highest rates of mortality after diagnosis of a heart failure, greater than that of people of several developing countries in the world. Patients reaching hospital at a later stage is one of the major reasons for this. Also, unavailability of doctors or experts aggravates the situation further. This design proposes development of a low-cost, handheld, 12-channel tele-ECG machine for providing cardiac care, especially in isolated rural areas.

Elementary spirit of the design is to provide real-time monitoring of a patient's ECG and generate a report which can be sent over to the expert's mobile through Multimedia Messaging Service (MMS) or any other file sharing app. In application fields ESD protection is recommended, as it may protect the device from other types of electrostatic discharge (ESD). The ESD protection layer is designed according to the recommendations in the ADAS datasheet. This protection layer satisfies different IEC (International Electro Technical Commission) standards such as IEC-61000 series. This design is suitable for rural areas where the time required for shifting patient to the health center is crucial. In cities as well, a handheld ECG device can reduce the inconvenience of the patients and their ECG can be monitored at their bedside itself.

ET-SI-007: Automatic Detection And Classification Of Tabla Taalas From Indian Classical Music

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Abstract: MIR(Music Information Retrieval) community has been in existence for couple of decades and has made significant advancements in automatic description of music. However, the main focus of research in MIR has been centered on Western popular music. Methods developed whatsoever are not always applicable to rich music traditions such as Indian Classical music. Also automatic pattern discovery is a relevant MIR problem. It has several applications in enriched and informed music listening, in music training, in aiding learners and musicologists working on different music cultures. The problem we are trying to solve here is separating the percussive component (here, Tabla taal) from the whole mix, and classifying the type of Taal(Taal is rhythmic beat accompanying the harmonics). Firstly, the percussive component is separated by using a Source Separation Algorithm known as Harmonic Percussive Source Separation (HPSS). The separated component has some harmonic components leaked into it therefore, by using some margin (provided in "librosa" library for Python) the percussive components are separated efficiently. Next step is to train the classifier on various Taalas and then classify the class of taala by providing the output from the HPSS algorithm. We adjusted the margin to get various results and, margins greater than 2 yielded better results.

Key words-Source Separation, Classification, Accuracy, Computations

ET-SI-009: Hardware Implementation Of Palm Vein Biometric Modality For Access Control In Multilayered Security System

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Abstract: Among the biometric modalities palm veins are the most secure and difficult to duplicate. This palm vein verification system aims to recognize a person from its exclusive palm vein organization that cannot be forged easily since veins are situated in inner layers of skin. Embedded devices are gaining increased attention in biometrics due to reliability and cost efficient systems. An embedded palm vein recognition system is the need of today in institutes, industries, security places etc. The aim of this proposed work is to implement palm vein identification system on hardware unit so that it can be further build into a single standalone unit, where it can be used in final level security in multilayered security system without any possibility of hacking. The hardware platform used in the proposed work is TI's Beagle board X15 with c66X DSP on it suitable for image processing applications and the algorithms used for matching of palm vein are performed using python programming language. The project focuses on storing images and implementing the matching algorithms on hardware platform itself such that PC or laptop is not needed for identification purpose. Principal component analysis (PCA) technique is used for verification of palm veins.

ET-SI-011: Automatic Attendance System Using Face Recognition

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Abstract: In every institutions such as colleges, schools etc. maintenance of the students is very important task which checks performance of the students. Every institute uses different methods to do this. Some use paper or attendance sheet to mark the attendance, some use biometric techniques .But this may take lot of time and also there can be many problems with these techniques. Hence we are going to develop such type of system which can overcome these problems such as wastage of time, incorrect attendance and many more. Our project is based on image processing approach. Face recognition is an important application of Image processing. In our project we are going to use Viola- Jones algorithm for face detection purpose and PCA (Principal Component Analysis) for face recognition purpose. For automatic attendance of students face recognition approach is used which is carried out without student's intervention. Multiple images of students will be captured by the camera and then detection of faces will be performed by algorithm which will be then compare with database and marking the attendance will be done.

ET-CN-002: IOT FORENSICS:PROVIDING SOLUTIONS TO AN IOA ERA

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Abstract: In recent times, the concept of Internet of Things has taken over the latest innovations and modern day to day lives. To describe IoT in a nutshell, it is the concept of connecting a device to the internet and other devices. According to IBM IoT can be defined as "A giant network of connected things and people – all of which collect and share data about the way they are used and about the environment around them. Over the past few years the technology of IoT has given away to a new platform of IoA better known as the Internet of Anything. IoA brings anything and everything "online" in a connectedness that generates an explosion of connected devices, from fridges, cars and drones, to smart swarms, smart grids and intelligent building.With everything now connected to an online platform it is hence necessary to delve into the world of IoT forensics. With so many devices connected together there are security threats where confidentiality ,integrity and security of data is at stake. IoT forensics can be viewed as a form of investigation where the evidence could be home appliances ,cars,readers,tags etc. The study of IoT forensics can further be divided into three categories: Device level forensics. Network forensics, Cloud forensics (if it is connected to the cloud services) Network Forensics include all different kinds of networks that IoT devices used to send and receive data. It could be home networks, industrial networks, LANs, MANs and WANs. For instance, if an incident occurs in IoT devices, all logs that traffic flow that has passed throw, could be potential evidence such as firewalls or IDS logs .

Key words- IoT Forensics, Network Forensics, Cloud Forensics