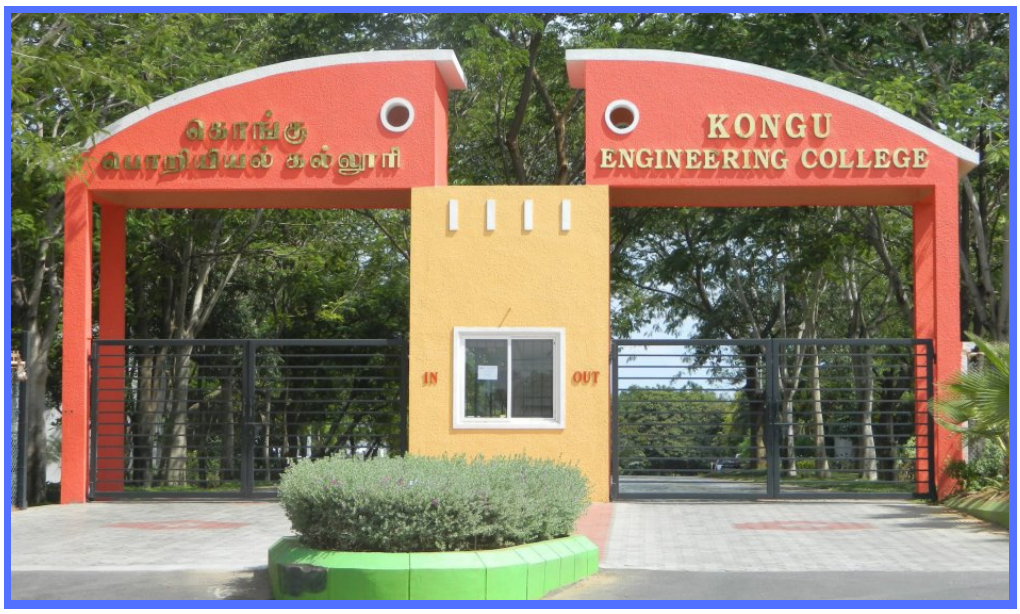
Proceedings of

4th National Conference on Current & Emerging Process Technologies

e-CONCEPT-2021

DEPARTMENT OF FOOD TECHNOLOGY

Estd : 1984



February 20, 2020

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KONGU ENGINEERING COLLEGE
(Autonomous)
Perundurai, Erode-638060, Tamil Nadu

Estd : 1984

4th National Conference on Current & Emerging Process Technologies

e-CONCEPT 2021

DEPARTMENT OF FOOD TECHNOLOGY

(20-02-2021)

e-CONCEPT 2021

Kongu Engineering College
(Autonomous)
Perundurai, Erode-638060

Institute Website: www.kongu.ac.in

Conference Website: https://econcept2021.co.in

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P. SACHITHANANDAN
CORRESPONDENT

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PERUNDURAI
ERODE - 638 060
TAMILNADU INDIA

MESSAGE

I feel very glad to note that the Department of Food Technology, Kongu Engineering College is organizing its 4th National Conference on Current & Emerging Process Technologies (Virtual Mode) 'e-CONCEPT-2021' on 20thFebruary, 2021.

The industry of Food Processing is a growing phenomenon and new technologies are on the arrival. Hence, it is necessary to update the younger generation about the development in the technologies.

Hope this platform will enable the students and faculty to upgrade their skills in this domain.

I wish the event every success.

CORRESPONDENT

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Dr. V. BALUSAMY
B.E (Hons), M.Tech., PhD
PRINCIPAL

MESSAGE

I am delighted to learn that the Department of Food Technology, Kongu Engineering College is organizing its 4thNational Conference on Current & Emerging Process Technologies (Virtual Mode)'e-CONCEPT-2021' on 20thFebruary, 2021.

The field of Food Technology have evolved to meet the challenges in the growing food manufacturing and consumer goods industries and the society. It is important to expose the budding engineers to advance in this field. This conference provides a platform for academicians / students across the nation to interact with each other and to share their knowledge.

I congratulate the faculty and the student of Food Technology Department for their hard work in organizing this event

I wish e-CONCEPT – 2021 a grand success.

PRINCIPAL

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Dr. V. CHITRA DEVI M.Tech., Ph.D.
Professor & Head
Department of Food Technology

HOD MESSAGE

Innovations, inventions and subsequent developments in various fields of science and technology paved the way to the sophisticated life we live. However, each and every technology has its own inherent merits and demerits which need to be addressed at times.

e-CONCEPT – 2021: National Conference on Current & Emerging Process Technologies is the fourth edition of its type, organized by the Department of Food Technology, which provides a platform to exchange and update the significant developments taken place in the fields of modern science and technology and to discuss the issues and challenges thereof.

I am pleased to be a part of the conference e-CONCEPT – 2021. I am thankful to the faculty, staff and students who made this function a remarkable one.

Head – Department of Food Technology&
Convener – CONCEPT 2021

ABOUT THE INSTITUTE

Kongu Engineering College (KEC) was established in the year 1984. Approved by AICTE, New Delhi and affiliated to Anna University, Chennai. The Institution has completed 36 years of dedicated and excellent service in the field of technical education. It offers 14 UG, 19 PG and 16 Research programmes in Engineering, Applied Sciences and Management branches. The Institution has got NBA accreditation for UG programme, Best Engineering College award and the Best Principal Award twice. The Institution is one among the best in imparting high quality technical education in Tamil Nadu and it is ranked high among the Engineering Institutes including IITs, NITs, Central Universities by various surveys conducted by magazines such as Outlook, The Week, Competition Success Review etc. The institution has established a Technology Business Incubator (TBI) supported by Department of Science and Technology (DST) Government of India.

ABOUT THE DEPARTMENT

The department was started in the year 2006 with B. Tech. program & M. Tech. from 2013 onwards in Food Technology. The department is also a Ph.D. research center recognized by Anna University, Chennai. It has been regularly a basis for producing efficient technologists with outstanding academics & overall performance in addition to pioneering the development of innovative technologies for conservation and processing of raw foods and value addition. Many sponsored seminars/ workshops by ICMR, DST, DBT, MoES, NSTEDB, AICTE has been conducted and organized national and international conferences. It has an established Research laboratory funded by UGC and MOFPI. Some of the sophisticated research facilities in the department are HPLC, Microwave Assisted Drier, UASB Reactor etc., and has laboratories for Microbiology, Biochemistry, Dairy Engineering, Food Process Engineering, Fruit & Vegetable Processing, Food Packaging, Baking & Confectionery and Food Analysis and Quality Control. It maintains good placement in leading food industries like ITC, Parle Agro, Hatsun Agro Pvt. Ltd., Cavinkare Pvt. Ltd. etc. It has MOU signed with various industries and Institutes/ Universities including SKM Egg Products, Vinu Foods, Angel Starch and IIFPT.

ABOUT THE CONFERENCE

Current industrial production systems follow well established, contemporary technologies that have reached their practical performance limits. The markets continue to demand process and products of higher quality, enhanced performance, greater durability, more precision and lower prices. Thus, a quest for new process technologies and innovation in established methods are inevitable. This National Conference e-CONCEPT-2021 focuses to enlighten the scientific fraternity with such current & emerging process technologies in the field of engineering. It is the fourth issue of its kind that aims at bringing together the leading academic scientists, industrial persons, researchers and UG, PG students of AICTE approved Engineering colleges and UGC approved Arts & Science and Pharmacy colleges to share their experiences and research outcomes in the aspects of emerging and advanced process technologies.

Our Major Domains are

1. Advanced Food Process Technology
2. Biochemical Engineering & Microbiology
3. Food Quality Assurance & Control
4. Food Storage & Preservation
5. Nanotechnology
6. Advanced Separation Technologies
7. Catalysis & Reaction Engineering
8. Chemical Process Technology & Safety
9. Polymers, Composites & Material Technology
10. Renewable Energy
11. Petroleum Refining & Petrochemicals
12. Waste Water Treatment, Reuse & Recycle
13. Process Modelling, Simulation & Optimization
14. Others - include advances in science, engineering, and technology

All shortlisted papers will be published in Conference Proceedings and the selected Full papers after review opted for SCOPUS Publication will be published in "AIP Conference Proceedings" (ISSN: 0094-243X, E-ISSN: 1551-7616).

Chief Patron	Thiru. P. Sachithanandan Correspondent, Kongu Engineering College
Patron	Prof. V .Balusamy B.E (Hons)., M.Tech., Ph.D., Principal, Kongu Engineering College
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Ms. K. Manonmani	Assistant Professor
Ms. G. Kriuthika	Assistant Professor
Ms. R. Meenakumari	Assistant Professor
Ms. N. DhivyaBharathi	Assistant Professor

AGENDA

Venue : Virtual Mode (Google Meet)

Meet Link: https://meet.google.com/twr-zyfx-fsx

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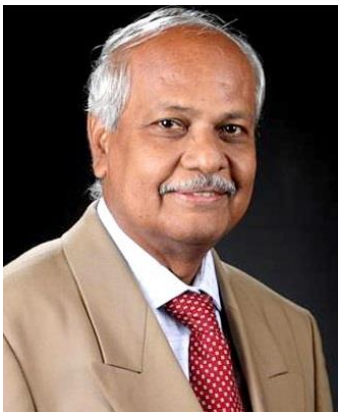
Date : 20-02-2021

09.30 am - 09.35 am	**PRAYER SONG**
09.35 am - 09.40 am	**WELCOME ADDRESS** **Dr.V.Chitra Devi** Professor & HOD/Food Technology
09.40 am - 09.45 am	**PRINCIPAL ADDRESS** **Dr.V.Balusamy** Principal, Kongu Engineering College
09.45 am - 09.50 am	**PRESIDENTIAL ADDRESS** **Thiru.P.Sachithanandan** Correspondent, Kongu Engineering College
09.50 am - 10.00 am	**INTRODUCTION OF CHIEF GUEST(s)**
10.00 am - 11.00 am	**CONFERENCE KEYNOTE ADDRESS** **Dr.K.Thangavel** Professor & Head, Department of Food Processing Technology Director (Centre for Food Science &Technology) Karunya Institute of Technology & Sciences, Coimbatore, Tamil Nadu **Dr.M.Arivazhagan** Professor, Department of Chemical Engineering National Institute of Technology, Trichy, Tamil Nadu
11.00 am - 11.15 am	**BREAK**
11.15 am - 01.15 pm	**TECHNICAL SESSIONS**
01:15 pm - 01:45 pm	**LUNCH BREAK**
01:45 pm - 04:00 pm	**TECHNICAL SESSIONS**
04:00 pm - 04:30 pm	**VALEDICTORY**

INVITED SPEAKERS



Dr. K. Thangavel

Director-Centre for Food Science and Technology,
Head-Food Processing Technology,
Karunya Institute of Technology, Coimbatore

Dr.K.Thangavel is Professor and Head Department of Food Processing Technology & Director, Centre for Food Science and Technology in Karunya Institute of Technology and Sciences, Coimbatore. He has done B.E Agriculture in Tamil Nadu Agricultural University, Coimbatore, India. Followed by M.Tech (Food and Dairy Engg) in Indian Institute of Technology, Kharagpur, India and PhD (thesis-Studies on Concentration of Skim milk and Whey by Ultrafiltration and their utilization in Ice cream Manufacture) in Tamil Nadu Agricultural University, Coimbatore, India. He started his career as an Assistant professor in 1984 and working as professor till date. He is a Member in Indian Society of Agrl Engineers (ISAE), International Society of Food Engineering (ISFE), Association of Food Scientists and Technologists of India AFST(I), Indian Dairy Association (IDA) and Indian Membrane Society (IMS). His research contribution of 60 Research papers in National and International Journals, 30 Abstracts and posters presented in National and International Conferences/symposiums and 2 Book chapters. His project lists are All India coordinated Project on Post-Harvest Technology. (AICRP-ICAR)-Research Engineer of the AI CRP scheme for more than five years, Micro and Nano encapsulation technologies for functional food Ingredients ICAR special grant Scheme, Establishment of food quality control lab at PHTC, TNAU. Ministry of Food process Engg, GOI and Ohmic heating technology for liquid egg white – MOFPI.

INVITED SPEAKERS

Dr. M. Arivazhagan
Professor - Chemical Engineering,
National Institute of Technology, Trichy

Dr.M.Arivazhagan is Professor in National Institute of Technologies, Tiruchirappalli. He obtained B.E. Chemical Engineering from Annamalai University in 1995, M.Tech Chemical engineering from Anna University in 1997 and PhD from NIT, Tiruchirapalli (Bharathidasan University). His area of interest includes Environmental Engineering, Nano Technology and Multiphase Flow. He is a life member in The Indian Society for Technical Education (ISTE) and member in The Institution of Engineers (India). He has contributed around 7 papers in international conference. He has also contributed 17 papers to international journal and 4 papers to national journal. He has done short term workshop course by self-financed for Research avenues in multi-interdisciplinary area of Chemical engineering in September 2012. He has been working as Associate Dean Faculty Welfare from 2012 to 2015, Hospital Committee member from 2010 to 2012, he has been awarded as the Best Teacher (Chemical) at VIT, Vellore in 1997. He has been again awarded as Best Teacher Award (Chemical) at VIT, Vellore in 1998. He has been awarded as Young Scientist Fellowship by TNSCST for the period of 2004 to 2005.

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ORAL PRESENTATIONS

1. Advanced Food Process Technology

AFP001

COMPUTATIONAL FLUID DYNAMICS (CFD) INVESTIGATION OF STEAM FLOW AND TEMPERATURE DISTRIBUTION IN A SMALL SCALE IDLY-BAKING OVEN

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Abstract

Idly is a form of savoury rice cake, originating from the Indian subcontinent, very popular as breakfast food in Sri Lanka and in Southern Indian states. These are produced from steamed lentils and rice together. By the method of fermentation, the starches can be broken down more quickly by the human body. There are various machines that bake idly for batch processing and mass production, which can be found in hotels and hostels. From past findings, it seems that too many researchers have sought to consider the temperature distribution in idly ovens experimentally. For the first time in the world, an attempt has been made to investigate the temperature distributions and steam flows within the new built oven by using a CFD approach. In this study, the computational fluid dynamics has been implemented in the food preparation of the idly-maker and the steam flow inside an oven. In this article it is investigated CFD model used to analyse hot air circulation and cooking conditions within the oven. The processes for transforming water into steam were addressed. Thermal efficiency inside the oven was discussed briefly during the whole study. This research was expanded to analyse the impacts of temperature distributions in food trays and nearby. This may be helpful in further planning and designing ovens for domestic use.

Keywords: *Idly-baking oven, Heat transfer, Fluid flow, CFD modelling, baking time, baking efficiency*

AFP004

EFFECT OF RADIO-FREQUENCY LOW PRESSURE COLD PLASMA ON RED CHILI PEPPER POWDER

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Abstract

A cold plasma treatment was explored to understand its effect on the physico-chemical properties of red chili pepper powder (RCPP). Radio-frequency powered plasma system operated at a low pressure of 60.8 kPa was used in the study. The experiments were conducted at two radio-frequency power levels (60W, 120W) over a time range from 0 to 10 min. Total phenols, antioxidant activity, colour, and moisture content were determined. Results showed that radio-frequency operating power and treatment time had significant negative effects ($p < 0.05$) on the parameters analysed. Changes in the physicochemical characteristics of the treated samples, especially the colour degradation were significant after 4 min of treatment. Degradation kinetics was determined for parameters studied to ascertain their order of reaction during cold plasma treatment. Order of reaction was decided from best fit models with the highest R^2, minimum bias, and error sum of squares. Total phenol followed a zero-order whereas antioxidant activity and colour followed first-order reactions. The results demonstrated the factors influencing the cold plasma treatment of RCPP.

Keywords: *Cold plasma, colour degradation, red chili pepper, antioxidant activity, degradation kinetic*

AFP005

NUTRITIONAL, SENSORY AND ANTIOXIDANT CHARACTERISTICS OF COMPOSITE MULTIGRAIN FLOUR BISCUITS BLENDED WITH SWEET POTATO FLOUR

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Abstract

Composite flour (CF) blends made from multigrain flour (MGF) and sweet potato flour (SPF) were used for making biscuits and compared with wheat flour (WF) biscuits as control. The biscuits prepared from three combinations of MGF: SPF as T1 (80:10), T2 (75:15), T3 (70:20) had significant difference in physico-chemical, antioxidant, textural and sensory analysis against control (100% WF). Addition of 5% levels each of pumpkin flour (PF) and Extruded Soy chunk Flour (ESF) with CF helped in improving colour and taste scores of CF biscuits. The T3 sample was found to have higher levels of fiber (1.52 g/100g), ash (1.71 g/100g), TPC (234 mg GAE/100g) and 22% scavenging activity. β-carotene was found to be higher in CF biscuits (390 to 823 µg/100g). CF biscuits exhibited lesser hardness and were more yellowish in color with better sensory performance. Present study revealed that the composite multigrain flour biscuits with MGF:SPF:PF:ESF at levels 70:20:5:5, prove to be of the right combination with superior nutritional and sensory qualities over ordinary wheat biscuits.

Keywords: Composite flour, biscuits, nutritional quality, phenolic content, antioxidant activity, sensory quality

AFP008

EVOLUTION OF MALTING PROCESS – AN OVERVIEW

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Abstract

Malting is a controlled process, where in the grain is soaked and germinated in the controlled conditions of temperature and humidity. The germinated grains are further kilned or roasted to bring down the moisture content and to cease the growth, and produce flavour and colour. The generic process of malting happens in 3 major steps 1) Steeping (Soaking of grains), 2) Germination (Sprouting and enhancing of enzymatic activity), 3) Kilning (Roasting to decrease moisture and arrest enzymatic activity).Barley (*Hordeum vulgare*) is the most preferred grain for malting. However, grains like wheat, rye, sorghum and certain millets are also malted in present days for various applications in food industry. Human beings have been malting grains for thousands of years, either intentionally by knowing its significance or accidentally. The relationship between the humans and cereals dates back to the time when humans had made a transition from hunting to farming. Malting is one of the oldest method of preservation of cereals, and, according to history it was started in 10000 BC. This paper summarizes the evolution of the malting from Near Eastern Fertile Crescent period to present day advanced technologies. The vigorous debates presented in various technical journals evaluates the interest of scientists in malting. This interest has led to various technological advances from Floor Malting to Steeping Germination Kilning Vessel.

Keywords: *Malting, Steeping, Germination, Kilning, Floor Malting, Steeping Germination Kilning Vessel*

AFP009

DEVELOPMENT OF VARIOUS FOOD PRODUCTS FROM ELEPHANT YAM

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Abstract

Elephant Yam is one of the most widely consumed tuber crop with more nutritional benefits. It is underutilized as its processing is very tedious and the oxalate content in yams leads to acridity. In order to minimize the processing time and to get enhanced product characteristics, few pre-treatments can be done. Pre-treatments like blanching, drying, salts addition, etc., can be adopted to get improved nutritional characteristics. It is currently used for bio color extraction, drying studies, antioxidant and flavonoid content quantification, osmotic dehydration, etc., Commercial food products like fried chips, yam noodles, yam papads, yam puffed snacks can be produced by optimizing the different ingredients. This review aims in examining the characterization of Elephant yam, pre-treatments adopted and the impacts of pre-treatments on the product, products formulated and optimized.

Keywords: *Elephant Yam, characterization, pre-treatments, products*

AFP010

FORMULATION OF MILLET SUGAR BALLS: DEVELOPMENT AND OPTIMIZATION

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Abstract

The present research was on the utilization of millet flours like foxtail millet (*Setari aitalica*), Pearl millet (*Pennisetum glaucum*), Barnyard millet (*Echinochloa esculenta*), and Kodo millet (*Paspalum scrobiculatum*) along with rice (*Oryza sativa*) flour for the preparation of sugar balls. Based on the texture of the millet sugar ball, pearl millet was considered to give better organoleptic attributes. Pearl Millet sugar balls were evaluated for their rising index, oil uptake, sugar intake for optimization. Pilot equipment is fabricated based on the requirement for millet sugar balls. It increased the quality and production rate of sugar balls. The Box- Behnken design of RSM was used to determine the optimum zone within the experimental design. The optimized composition of pearl millet sugar balls was rice (10 g), black gram (11 g), and pearl millet (90 g) was predicted to give the rising index, sugar intake, oil intake, and core moisture of 0.2 cm, 13 %, 14 %, and 11 % respectively. Rising index and oil intake were increased when the black gram ratio to pearl millet ratio was altered. Renovating black gram ratio to rice, sugar intake was increased The nutritional analysis for pearl millet sugar balls was done and found to have carbohydrate of 34 g/ 100g and protein of 4.8 g/ 100g. High nutritious snack from traditional food product has been developed.

Keywords: Pearl millet Sugar-ball, Box- Behnken design rising index, sugar intake, oil intake.

AFP012

3D FOOD PRINTING: A CONSUMER ORIENTED NOVEL TECHNIQUE

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Abstract

3D printing, otherwise called additive manufacturing, is a strategy for making a three-dimensional article layer-by-layer utilizing a computer made design. 3D printing is an additive process whereby layers of material are developed to make a 3D part.3D printing starts with 3D model of any product one would like to print.Running model through a computer-based software which slices the model into layers. These layers are then fed to 3D printer one at a time starting with bottom and moving to top having thousands of layers. 3D printer uses inkjet similar to the ones in any common 2D printer having ink liquids but 3D printerhasfood mixtures filled in the inkjets, alsofood needs to be mashed up or ground before one can process it and additives in some case liquid nitrogen is needed. Food products produced using 3D printers are very versatile the food can be structural, sculptural, geometrically & mathematically precise, integrally perforated, it can be anything one can think of. One can make food according to one's DNA which is good for that individual. It has a lot of environmental benefits like less agricultural land is needed, less food miles, less food wastage, no pre-packaging and distribution, less food storage, more absolute freshness and more financial and ecological benefits.

Keywords: *3D printing, Software, Versatile, Ecological, DNA*

AFP013

OPTIMIZATION OF ULTRASOUND ASSISTED EXTRACTION OF ANTHOCYANIN FROM GRAPE SKIN THROUGH RESPONSE SURFACE

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Abstract

Anthocyanins are naturally occurring compounds that impart colour to fruits, vegetables and plants. The extraction of Anthocyanin from Grapes (*Vitis Vinifera*) skin by ultrasonic-assisted process was studied. The effects of the operating conditions, such as the ratio of Amplitude, extraction temperature and extraction time, on the extraction yield of Anthocyanins were studied through response surface methodology (RSM). The developed experimental design with a factorial 3^3 ,where the factors were amplitude, temperature, time at the levels 20%, 40%, 60%, at times 5 min, 10 min, 25 min, and at temperatures 20 °C, 30 °C, and 50 °C for each factor respectively .The best possible combinations of extraction variables were obtained for the maximum content of anthocyanins from grape peel extracts using response surface methodology. Ultrasonic- assisted extraction is more efficient and rapid to extract Anthocyanins from Grapes' (Vitis Vinifera) skin, due to the strong disruption of fruit tissue structure under ultrasonic acoustic cavitation. Having higher amplitude (%) at 60% achieved maximum extraction levels (300.4 – 304.5 mg). Reduction in extraction volume was comparable at such amplitude and extraction time for temperatures 20 to 40 °C. Allowing 60 min extraction time at 60% amplitude achieved maximum extraction levels at 50 °C.

Keywords*: Anthocyanins, Grape peel extracts, response surface methodology, Ultrasonic- assisted extraction*

AFP014

A STUDY ON THE EFFECT OF MICROWAVE DRYING OF HERBS FOR DETERMINATION OF ANTIOXIDANT ACTIVITY

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Abstract

Drying is one the oldest method used in preservation of foods. Preservation is achieved by removal of moisture through conduction, convection and/or radiation to obtain a product with better quality and extended shelf life. For this purpose, microwave drying is considered to be one of the fastest methods of moisture removal from the product. This work has focused on the effect of microwave drying of herbs and also the retention and degradation of essential nutrients. The comparison between the herbs is done in terms of determination of antioxidant activity. The better drying conditions for *Phyllanthus niruri* and *Boerhaaviadiffusa* was at 0.2 kW with superior quality of the end product whereas *Annonamuricata* was at 0.6 kW. On investigating the antioxidant activity, the samples of *Phyllanthus niruri* and *Boerhaaviadiffusa* dried at 0.2 kW exhibited highest antioxidant activity. The sample *Annonamuricata* dried at 0.4 kW exhibited highest antioxidant activity. To be applied in large scale applications, the process needs further research and improvements to achieve a product with better sensorial and nutritional attributes.

Keywords: *Preservation, microwave drying, quality, antioxidant activity, medicinal herbs.*

AFP015

EFFECT OF DIFFERENT EXTRACTION TECHNIQUES ON THE BIOACTIVE CONSTITUENTS OF *BOERHAAVIA DIFFUSA*

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Abstract

Boerhaavia diffusa (commonly known as Punarnava), a green leafy vegetable that belongs to the *Nyctaginaceae* family, consumed by South Asian population due to its nutraceutical properties and this medicinal plant as whole was traditionally used in treating different ailments due to its multiple pharmacological activities viz., immuno suppressant, anti-diabetic, analgesic, hepatoprotective, antiviral and antifibrinolytic activity, etc. *Boerhaavia diffusa* plant is reported to posses many pharmacological, clinical, and antimicrobial properties. The therapeutic importance of plants is mainly due to polyphenols and their antioxidant properties. In the present study, the antioxidant potency was investigated by determining the DPPH radical–scavenging activity. The various characters like total phenolic content, total flavonoids content and various phytochemicals were investigated. The phytochemical studies on *Boerhaavia diffusa* has revealed that the plant is rich in bio active constituents such as tannins, Saponins, Alkaloids, flavonoids, Terpenoids , glycosides, Steroids and phenols. These bioactive compounds are responsible for the healing effects of *B. diffusa* against a number of human ailments like cancer, diabetes, inflammation, harmful radiations induced damage, gastrointestinal problems, microbial infections, prostatic hyperplasia, liver disorders, cardiac problems, anxiety problem etc. The microwave assisted extraction and ultrasound assisted extraction were adopted for the extraction of *Boerhaavia diffusa* for the determination of the bioactive compounds.

Keywords: *Boerhaavia diffusa leaf powder, extraction techniques, bioactive compounds*

AFP016

CHARACTERIZATION OF ACTIVE COMPONENTS OF DRYING IN DIFFERENT VARIETIES OF MANGIFERA INDICA (MANGO) AND DEVELOPMENT OF GUM CANDY BY COMBINATION OF MANGO POWDER AND TAMERIND FRUIT POWDER

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Abstract

Infectious diseases that affect almost 50,000 people every day continue to spread and have become a major global problem and the key explanation is the emergence of multi-drug resistance in bacterial strains. This disturbing situation has therefore required the hunt for new and natural antimicrobial substances with greater bioactivity and no side effects. In functional foods, bio-active compounds exist and can protect us through several mechanisms against illnesses. To protect against diseases related to oxidative stress, the anti-oxidant properties of several BaCs are important. Fruit consumption provides us with anti-oxidants that can work to provide protection in a synergistic manner. Only the pulp is used in mango fruit, while all other pieces are discarded and cause environmental pollution. Due to its high nutraceutical and medicinal value, the popularity of mangos is on the increase. There are numerous Polyphenols in mango, but Mangiferin, is abundant and bioactive. Therefore to provide greater insights into their medical, nutritional, and industrial applications, as well as their role(s) in defending the plant, all bio-active constituents in mango need to be studied. The technology in which freeze-dried mango powder retains the same quality as fresh ripe mango pulp has already been developed. The goal of this analysis is to assist with the proper use of mangoes in order to enhance nutrition and health, as well as to improve our understanding of the plant defense mechanisms that depend on these compounds.

Keywords*: Mangifera indica, mango pulp, freeze-drying, bioactive compounds.*

AFP017

DEVELOPMENT OF READY MIX IDLI BATTER

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Abstract

Idli is one of the most common fermented breakfast foods on the Indian sub continent, made from a rice (oryza sativa) a cereal legume blend .and black gram dhal (phaseolus mungo).it is a natural fermentation of microflora dominated by lactic acid bacteria and yeast .Reducing quality standardization and improvement of idli batter is of great commercial significance for large scale idli production during fermentation time. And this can potentially achieved through better understanding of the fermentation of idli batter.fermentation rate and microbial modifications in the batter; the nutritional texture and sensory characteristics of the prepared product have been evaluated. Fermentation also improves the protein efficiency ratio (PER) and a significant increase in predicted biological value of idli over the unfermented mixture. . Current study is undertaken to optimize the process of idli batter which will help the industrial production of idli batter with the desired quality.

***Keywords:* idli, shelf life, natural fermentation, blend ratio, viscosity,** *and vitamins.*

AFP019

NUTRITIONAL AND PHARMACOLOGICAL PROPERTIES OF TIGERNUT *(CYPERUS ESCULENTUS)* AND ITS VALUE ADDITION

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Abstract

Tigernut *(Cyperus esculentus)* consists high amount of soluble glucose and oleic acid, along with high energy content of starch, fats, sugars, and proteins, they are rich in minerals such as phosphorous, potassium, vitamins E and C. Tigernut helps to prevent from a heart attack, thrombosis, and cancer especially of the colon, and to reduce cholesterol. These numerous advantages and health benefits associated with tigernut makes it more attractive as an alternative source of milk in yogurt production. It also contains a high amount of oleic acid which has a positive effect on cholesterol level, due to its high content of vitamin E. The nut was found to be ideal for children, older persons, and sportsmen. Therefore, tigernut with its inherent nutritional and therapeutic advantages could serve as a good alternative to cow milk in the production of yogurt. Therefore, this review article is aimed at sharing comprehensively available information on tigernut and recent research.

Keywords: *Tigernut, Nutritional, Antioxidant, Products, Biofuel and health benefits.*

AFP020

EXTRACTION TECHNIQUES OF BIOACTIVE COMPOUNDS FROM MEDICINAL PLANTS (*MIMUSOPS ELENGI*)

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Abstract

Bioactive compounds are the secondary plant metabolites, which have actions in the body that may promote good health. The use of bioactive compounds extracted from *Mimusops elengi* in biomedical and natural product research has been increasing nowadays. The fruits, stem, leaves and barks are utilized in various Ayurvedic medications to cure several disorders. *Mimusops elengi* holds various properties like antibacterial, antifungal, anticariogenic, free radical scavenging, antihyperglycemic, antineoplastic, gastroprotective, antinociceptive and diuretic effects. Thus, signifies the need of identifying the proper extraction technique for efficient bioactive extraction. This paper reviews the various extraction techniques namely, Conventional Soxhlet Extraction (CSE), Hydro distillation, Ultrasound-assisted extraction (UAE), Microwave-assisted extraction (MAE), Enzyme assisted extraction, Pressurized liquid extraction (PLE) and Supercritical fluid extraction (SCFE).The efficiency of extraction depends on main parameters such as temperature, pressure, solvent type, solvent concentration, extraction time, and temperature. Non-conventional extraction techniques are advantageous than conventional, in terms of less solvent usage and less extraction time. Therefore, the combined application of extraction methods will enhance the efficiency of bioactive compound extraction from *Mimusops elengi*.

Keywords: *Mimusops Elengi, bioactive compounds, medicinal plants, extraction methods.*

AFP022

OPTIMIZATION OF GUAVA SQUASH INCORPORATED WITH PEANUT MILK

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Abstract

The purpose of this study was to optimize the peanut milk blended squash. The treatment consisting of different proportion of peanut milk blended squash were evaluated for physicochemical and sensory characteristics. The sample with 65% peanut milk (A) replaced to water were optimized. Protein, ascorbic acid and dietary fiber content of sample A were 4.17%, 40.74mg/100g and 1.5g respectively. Shelf life studies was evaluated for the optimized samples without addition of preservative for a period of 7 days under refrigerated condition and with addition of preservative (KMS) for a period of 15 days under ambient condition. The collected data revealed that pH, TSS, titratable acidity, ascorbic acid decreased in squash while moisture increased with increase in storage period.

Keywords: *Peanut milk, guava squash, analysis.*

AFP023

IMMUNE BOOSTING COMPRESSED TABLET

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Abstract

During the pandemic situations like COVID-19 as well as adverse climatic changes we are prone to diseases. These diseases are caused by microbes and other allergen that trigger the inflammations. We have plenty of sources that has anti-inflammatory properties and certain compounds that boost immune power. The following spices, herbs and fruit namely Turmeric (*Curcuma longa*), Amla (*Emblica officinalis*), Nilavembu (*Andrographis paniculata*), clove (*Syzicum aromaticum)* and vajradantri (*Barlerone prionitis*) has been chosen as they contains key bio-active compounds which treats various microbial infection, cough and additionally used in medical preparation to treat AIDS, Auto-immune diseases and inflammations. The selected materials are dried, milled, extracted and analyzed for its bio-active compounds. Based on the analysis data the above ingredients are blended to have a bio-active base, taking into consideration, RDA value and sensory parameters. The sugar based compressed tablet is chosen as a vehicle for incorporating this bio-active base.

Keywords: *Immune booster, Andrographis paniculate, Syzygium aromaticum, Curcuma longa, compressed tablet.*

AFP024

PROCESSING, QUALITY AND NUTRITIONAL ASPECTS OF INSTANT SOUPS

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Abstract

Soups are one of the most primarily liquid and a stable food is eaten in many countries is soups. Instant soups have been globally known and food intake is growing worldwide. They also popularized the properties of instant soups such as flavor, nutrition, comfort, protection, longer shelf-life, and fair price. Color, texture, and flavor, cooking consistency, rates of rehydration during the end of the preparation, and the appearance or lack of a rancid taste following prolonged storage are quality factors essential for instant soups. Instant soup making has been researched by the use of unit operations to consider the effect of ingredients and processing variables on soup consistency. It also addressed uses of newer approaches such as biochemical and microbiological analysis to consider improvements in chemical values and changes in microbiological values. Unique attempts are ongoing by researchers to optimize the formulation and increase the shelf life of instant soups. Many investigators are also studying the performance of soup fortified as an assembly important tool in human health and enhancing its nutritional compositions. This analysis focusing on ingredient usability, packaging involved, soup assessment consistency requirements, recent fortification patterns, and current awareness of instant soups.

Keywords: *Instant soups, Ingredients, Processing, Quality analysis, recent trends*

2. Biochemical Engineering & Microbiology

BEM003

DETECTION OF MAIZE LEAVES DISEASES USING CONVOLUTIONAL NEURAL NETWORKS

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Abstract

Agriculture faces a variety of maize diseases that farmers are unable to identify them. Diseases grow from day to day and many crops will die due to lack of proper treatment and also failing in finding what kind of disease it has been. The most common diseases in maize are Common rust, Northern leaf grey spot, Blight etc. Observing the plant with naked eye and detecting the disease results in inaccurate detection of diseases. This leads to the wrong usage of pesticides which causes harmful chronic diseases on human beings. So, automatic and accurate estimation of disease is most essential in food security. Modern technologies have given society the ability to produce enough food to meet the demand for the food. The application of digital technologies may save time and protect crops from decaying well in advance. Hence, an idea for detecting the disease in the affected maize crops automatically using recent digital technologies will be of more useful to the farmers. Deep learning has recently attracted a lot of attention with the aim to develop a quick, automatic and accurate system for image identification and classification. The deep learning techniques and its variants have great potential in the detection of maize disease in modern agriculture. The main focus of this article will be on fine-tuning and evaluation of state-of-the-art deep convolutional neural networks for image-based maize disease classification .In this work, a Deep Convolutional Neural Network (CNN) model has used to detect and classify the diseases in maize leaf and in order to increase the accuracy of detection, AlexNet architecture is used to detect maize leaf disease. In CNN, the accuracy is 84% and in AlexNet architecture, the accuracy of 97% is achieved.

Keywords*: Agriculture, Maize leaves diseases, Deep Learning, Convolutional Neural Network, Alexnet, Accuracy*

BEM007

COMPARITIVE ANALYSIS ON DIABETIC RETINOPATHY USING DIFFERENT ALGORITHM

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Abstract

Diabetic retinopathy is a condition that causes total vision loss in people who have diabetics. It usually affects the blood vessel in the light sensitive layer of tissue called retina. Since there are no earlier symptoms, people are not aware that they have DR. Later symptoms like blurry vision, floating spots in vision, blindness will help to identify DR. But by consistently screening and monitoring the eye we can identify earlier by some factors like haemorrhage, microaneurysm, exudates and cotton wool spots. This paper brings out the comparison on the basis of different performance activities like accuracy on different algorithm that is being analysed on matlab platform.

Keywords: *Diabetic retinopathy, haemorrhage, microaneurysm, exudates, Image Processing, fundus image, pattern classification, pattern recognition.*

BEM008

COMPARITIVE STUDY ON SKIN CANCER DETECTION

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Abstract

Skin diseases are most common form of infectious disease occurring in all ages of people. They have a serious impact on people's life and health. Current research proposes an efficient way to detect certain harmful skin disease including skin cancer. It takes mostly long time to determine the type of skin disease affected. In our country, not many statistics are existing to prove the exact frequency of skin infections. Today, definitely there is a need for computerized system to evaluate patient's risk of skin problems using images of their skin lesions. This paper is about constructing a diagnosis system based on the image processing techniques and obtaining results with better accuracy by comparison of certain algorithms. This helps the dermatologists for early diagnosis in situations even when the dermo-scopes are not available. Herein, based on the results obtained in a short period of time, we will be making the users to detect and recognize the skin cancer with the help of image processing techniques.

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BEM009

Incorporation of *sesbania grandiflora* flower's polyphenol extract in Yoghurt and its effect.

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Abstract

Agathi or *Sesbania grandiflora* is a flowery vegetable can cure illness and diseases with wide health benefits. Polyphenol content of this flower has antimicrobial activity. However, research on the possible stimulatory role of phenolic compounds on beneficial intestinal bacterial growth is scarce .Thus the microwave conditions were optimized using Response Surface Methodology for extraction of polyphenols. The optimized polyphenol extract were incorporated in the yoghurt cultured with *Lactobacillus acidophilus, Lactobacillus bulgaricus, Streptococcous thermophillus* . The conditions for the preparation of yoghurt conditions were optimized using RSM to assess the different combination of incubation time and extract concentration on pH, Titratable acidity, Syneresis index and microbial cell count. The optimal condition for the investigated responses were Incubation time of 5 hr with 5.60% of extract concentration. The determination of optimal conditions and predicted values was based on the desirability of 0.865. Moisture was the parameter with the highest value; in the same way, total carbohydrates were the most abundant macronutrient, followed by proteins for the optimized yoghurt. The optimized polyphenol extract, promoted statistically significant increase in yoghurt antioxidant efficiency and Polyphenolic content of optimized yoghurt.

Keywords*: Sesbania grandiflora, Extraction, Polyphenols, optimization, Probiotic drink.*

BEM011

EXTRACTION OF CELLULOSIC FIBRES FROM AGRICULTURAL WASTES AND ITS APPLICATIONS

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Abstract

One of the major problems in the environment is deforestation. In the last five years the deforestation rate is about 10 Million hectares per year. The main reason for deforestation is the dominance of wood dependent industries and need for cellulose in manufacturing industries. On the other hand, agricultural biomass is generated in huge amounts in India. Agricultural wastes are considered to be a promising and novel source for the preparation of cellulose, a highly valued precursor for production of cellulose based bio-polymer, paper, and textile products. Recently, enormous researches are being performed in the utilization of agricultural biomass to various by-products. In the present work, a review has been done on the utilization of different agricultural wastes as an alternative for the extraction of cellulose for application in various industries. Agro wastes like rice husk, sugarcane bagasse, areca fibres, etc. have been discussed. Among these the highest cellulose content of 72% is extracted from areca leaf fibres.

Keywords: *Agro-wastes, cellulose, extraction, bio-products, waste management.*

BEM012

DEVELOP A FORECASTING MODEL FOR INFECTIOUS DISEASE

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Abstract

The spread of COVID-19 in the whole world has placed mankind in harm's way. The resources of unquestionably the greatest economies are concerned due to the immense infectivity and infectiousness of this ailment. The limit of ML models to measure the amount of impending patients impacted by COVID-19 which is currently considered as an imaginable threat to mankind. It was first perceived in December 2019 in Wuhan, the capital of China's Hubei area. The objective of this investigation is to propose an envisioning model using the COVID-19 open dataset from top impacted regions across the world using AI computations. Simulated intelligence figurines help us with achieving this objective. Backslide models are one of the controlled AI strategies to aggregate tremendous degree data. This investigation intends to apply Multivariate Linear Regression to predict the amount of asserted and destroyed COVID-19 cases for a scope of one and fourteen days. The test outcomes explain 90% irregularity in conjecture. The computations are surveyed using the screw up organization, for instance, Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), and precision for top affected locales across the world.

Keywords: *Forecasting, Visualization, MultiVariate Linear Regression, Tableau, MAE, RMSE*

3. Food Quality Assurance & Control

FQAC001

AUTOMATION IN EGG COLLECTING SYSTEM IN POULTRY FARMS

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Abstract

The modern layer poultry farm came in to the picture from the 19th century. It shows the rapid increase in every year with 8% growth rate. India is the 3rd largest country and one of the leading egg exporting and producing country. Now-a-days layer poultry farms had much advancement all around the world Even we are in the advanced scientific world, we cannot update or adopt some new technologies; we are almost leading in industry but we are in under developing condition in that field so we can't invest more on it. Easy shed is the newly evolved technologies in layer poultry farms for automatic egg collecting and feeding, but in India it costs more expensive. Even for small farms the technique requires major modification or to reconstruct the farms, which is not cost efficient and also not easily adaptable by the Indian poultry farmers. Therefore, we proposed a technique which is more cost effective and easily adaptable to existing traditional farms for collecting eggs from the laying tray and arranging in a distribution tray. The major man power and cost required for the industry is in collecting of the eggs and packing of eggs. The proposed design in poultry industry will reduce the production cost of eggs by in man power. As well as it increases the profit by reducing the loss of damage in the eggs and also it is time efficient than the conventional man power method. Technological up-liftments in this business enable the novel alternatives for smarter egg collection systems. Efficient way of automatic egg collection system which will be with reduced cost and reduced time can be an effective alternative for the existing method.

FQAC002

EFFECTIVENESS OF IMPLEMENTATION OF 5S IN FOOD INDUSTRY DURING COVID 19

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Abstract

5S housekeeping is the basics of Lean Manufacturing systems. As a tool for cleansing, sorting, organizing and providing the required basic initial changes for workplace improvement. This paper studies the effectiveness of implementation of 5S methodology in the Angel starch and food Pvt ltd. By following the 5S methodology, it shows important improvements to safety, productivity, efficiency and housekeeping. It also intends to create a stronger work ethic inside the management and staff who would be expected to continue the great practices. To identify the potential level of quality improvement and at the same time will analyse their ability and weakness of every division within the company. Effectiveness of 5S is analysed using before and after implementation in angel starch using tools. Tools like inventory turnover ratio, labour productivity, process rejection etc… has been used for measurement of daily production, sales, customer return, process rejection, machine breakdown. Result of this research is obtained from comparative measurement of before and after organisational performance. The result shows that 5S is a effective tool for improvement of organisation performance.

Keywords: *5S, implementation, quality, productivity, effectiveness.*

FQAC003

DEVELOPMENT AND SENSORY EVALUATION OF PINEAPPLE JUICE WITH PEEL

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Abstract

Around the world one of the important challengeable jobs was waste utilization in fruits and vegetable processing industries. In India nearly 40% of the total produces was wasted and the major reasons behind the waste of perishables are absence of food distribution chains, less cold storage centres, and lack of processing units. Above all odds, India's fruit and vegetable production is three to four times more than cereals per unit of land. Pineapple is one of the most consumed fruit in the world and India produce averagely 1.2 million tonnes of pineapple per year. Even after processing and consumption, nearly 50% of pineapple (peel and core) is wasted. The discarded pineapple skin, crown, stem, and root also contain health benefits and used in therapeutical and food industries. In this study, peeled and unpeeled pineapple juice was prepared and its physiochemical, nutritional and sensory properties were tested. Magnesium, sodium, and total fat of the unpeeled juice increased and total sugar in the unpeeled juice decreased compared to the peeled pineapple juice. There was a slight increase in pH, titratable acidity, viscosity and total soluble solids also recorded in unpeeled pineapple juice. The color value decreased in unpeeled pineapple juice. But the sensory results of unpeeled pineapple juice showed better results for taste, aroma, and flavor than peeled pineapple juice. The study concludes that based on magnesium content and sensory properties in unpeeled pineapple juice makes it a valuable fruit juice.

Keywords: *unpeeled and peeled pineapple juice, waste utilization, nutritional, magnesium, sensory properties*

FQAC004

AN EXAMINATION ON THE UNDERSTANDING OF INFORMATION PRINTED ON THE LABELS OF FOOD PRODUCTS BY NON-NATIVE SPEAKERS – AN INDIAN EXPERIENCE

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Abstract

Food labels act as one of the most important communication channels between the food product manufacturers and the consumers. The food processing industries in India produce many varieties of consumable food products catering to the needs of the consumers. But, in most cases the food product information, ingredients list, nutritional facts, etc., on the labels are printed only in English. As a result, most of the non-native speakers find it very difficult to understand the information like 'directions to use', nutritional facts and other details of the product. The objectives of the study are to examine the understanding capability of the non-native speakers about the information printed on food products and to ascertain the influence of food label information on the purchase decision of non-native speakers. The scope of the study is restricted only to the non-native speakers living in rural areas of Erode district, Tamil Nadu. The researchers collected data by administering interview schedule method. The convenience sampling method was used by the researchers for data collection. This study found that a significant difference exists between non-native male and female speakers in understanding the food label information. This study also found that name of the product, nutrition values, ingredients list and appearance of the labels influence the purchasing decision of the non-native speakers.

Keywords: *label appearance, nutrition value, non-native speakers, ingredients, label information.*

FQAC006

FOOD SAFETY AND QUALITY ASSURANCE ALONG A VALUE CHAIN – PERSPECTIVES TOWARDS DEVELOPING COUNTRY

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Abstract

Food value chain encompasses food quality and safety as prime factors assuring uninterrupted movement of food, making the production and consumption ends meet. The quality and safety aspects are gaining a vast momentum in the developing countries bringing assurance systems to the limelight. Though this is the case, there is formal and informal channels of food flow which imposes a check in quality and safety of foods. There are several food safety standards, certifications and quality assurance systems available in each countries. Internal and external quality control systems are prevalent in developed countries. Rethinking of the availability and applicability of similar systems in the food chains of developing countries could turnaround the business model linking the stakeholders of a value chain whereas bringing about economic impacts. In this study, we highlighted the implications of simple existence and application of quality assurance systems along a value chain. This paper forays into the several challenges and opportunities for quality assurance systems and policies existing for a better value chain performance and better economy covering wide area of literature adoption and adaptation.

Keywords: *Value chain, Food safety, Food quality assurance, Certifications, Food policies.*

FQAC007

DEVELOPMENT AND CHARACTERIZATION OF SUPERFOODS

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Abstract

Superfoods have a good amount of nutrients, phytochemicals, and health-supporting bioactive compounds. These superfoods are minimally processed to retain most bioactive compounds and antioxidants. The superfoods used in this study are moringa leaves, spinach, lemongrass, banana, and ginger. They contain phenols, flavonoids, vitamins, minerals, essential oils, and antioxidants. The main health benefits of superfoods are energy booster, aid digestion, and also increase heart and brain health. They also act as detoxification and alkalizing agent. The research work is to design and develop a ready to mix superfood. Followed by the product composition is optimized based on the evaluation of nutritional and sensory properties. This superfood pre-mix may incorporate into smoothie, juices, soups, and more to improve the quality and taste. Nowadays, consumers are more inclined to buy natural food products to improve their health and palatability. This superfood product may include as a part of their healthy diet to increase palatability.

Keywords: *superfoods, bioactive compounds, nutrients, antioxidants, health benefits*

FQAC008

EFFECT OF NUTRITIONAL AND ANTIOXIDANT ACTIVITY OF RAW AND PROCESSED KODO MILLET PASTA

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Abstract

Millets are considered to possess numerous medical advantages, including the Kodo millet, which is exceptionally nutritious however has gotten almost no consideration as far as creation and use. Aim of the study is to formulate processed (raw, boiled and germinated) kodo millet flour and to study it's nutritional, textural, sensory and antioxidant activity of kodo millet incorporated convenience food pasta. Totally 15 variants of kodo millet incorporated pasta were formulated by mixing 20-60% of kodo millet flour in 40 -80% of whole wheat flour at different variations. The developed pasta nutritional, textural, colour, sensory and antioxidant activity (DPPH IC_{50}) was analysed using standard procedure. Results revealed that, processed kodo millet pasta showed a high nutritional value than the raw kodo millet pasta and showed a significant difference at 0.05% level. The color analysis of pasta showed a 5% level of significant difference in luminosity and chromaticity parameters in both dry and cooked raw and processed kodo millet pasta. The sensory analysis showed that the pasta overall sensory score (8.60) was good in appearance, colour, flavour, texture, and taste-wise. The antioxidant activity revealed that each one the formulated pasta had a robust antioxidant activity. Therefore the study gives us scope for the formulation of raw and processed kodo millet pasta will increase the consumption levels of kodo millet among the general public.

Keywords: *Kodo Millet, Processing, Pasta, Convenience foods, Antioxidant activity.*

4. Food Storage & Preservation

FSP001

INVESTIGATION AND COMPARISON OF DIFFERENT CNN ARCHITECTURES ON TOMATO LEAF DISEASE PREDICTION USING DEEP LEARNING

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Abstract

The tomato crop is the most common vegetable plant in the Indian market which is economically valuable and cultivated in enormous volumes. The productivity diminishes to large scale due to diseases caused by pests, and pathogens. The tomato diseases are of different forms that affect plant's root, stem, leaves and so on. Monitoring the tomato crops for detection of diseases plays a crucial role in optimum production. The existing method for detecting tomato leaf diseases is simply the visual observation by agricultural experts and plant pathologists. It is time consuming and also costs high. Sometimes, they often fail to diagnose specific diseases leading to inaccurate assumptions. The proposed method uses Convolutional Neural Network to identify the diseases of tomato leaves with the help of features that are extracted from the images. It implements three different CNN architectures and experimented with three different Optimizers. One of the CNN architecture is LeNet, it achieves an accuracy of around 90-92%. Other architecture is AlexNet where it achieves an accuracy of around 92-97%.The third architecture is VGG16, it achieves an accuracy of around 90- 94%.

Keywords : Deep *Learning, CNN, Tomato Leaf Disease, Prediction, Transfer Learning*

FSP002

EDIBLE CUP

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Abstract

In the rapid-changing world of innovation, the materials that holds foods such as paper cups, aluminum foils play a significant role in the evolution of the food industry. Disposable paper cups are well known for consuming beverages. Even though paper cups are recyclable, the plastic coating (polyethylene) in the cup minimize the degrade rate which brings about litter the landfills. Edible cutlery is a new postulation where the cutlery can be eaten in the wake of ingesting the food or drink. Numerous beneficial facts are aligned with edible cutlery that make them a superior product over traditional plastic-made products. It is eco-friendly, cost-effective and full of nutrition values. Edible cup is made of wheat flour, sugar, fat and egg. The production process includes essential operations like kneading, sheeting, molding, baking and cooling. Edible cup were subjected to several quality analysis such as diameter and thickness of the cup, spread ratio, bulk density, breaking strength, and color analysis, moisture absorption rate, acid insoluble ash, texture analysis and evaluated for consumer acceptance.

Keywords: *Disposable cups, Landfills, Edible cutlery, Eco-friendly, breaking strength, Moisture absorption rate.*

FSP003

WAREHOUSE RECEIPT FINANCING- SYSTEM TO ENHANCE COCONUT AND RICE INDUSTRIES IN WESTERN DISTRICTS OF TAMILNADU

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Abstract

In India, coconut and rice sectors play a vital role in production in the agricultural economy. Though food processing industries are evolving rapidly, these sectors face the problem of lack of funds to do their businesses, inefficiencies in marketing chain especially in price mechanism. Finance is also a very essential in any business cycle. The paper attempts to study the effectiveness of warehouse receipt financing based on the analysis using the primary data collected equally from the registered businessmen in the coconut and rice industries via Coconut Oil and Rice Mill Associations in the selected location of Tiruppur and Erode Districts of Tamil Nadu. Warehouse Receipt Financing can also be used to have continuity in production, price and ensure food security. The study also focused the provision of facilitation that are provided by the warehouses to ensure the quality and safety of goods stored, the main motive behind to store the goods in the warehouses. As a result, almost majority of the business are using the warehouse receipt financing effectively by regularly storing the stocks in the warehouses. These goods are stored with the motives of speculative followed by transactive and they are also gratified with the facilitation provided in the warehouses. WRS helps the coconut and rice sectors in the selected region to augment the profitability without compromising the quality and safety of the goods stored.

Keyword: *Food security, warehouse receipts, motives, storage and quality.*

FSP004

FOOD STORAGE AND PRESERVATION

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Abstract

Food storage and preservation involves different food processing steps to maintain food quality at a desired level.The processing of food is no longer as simple or straightforward as in the past.More number of new preservation techniques are being developed to satisfy current demands of society.The key objective of food processing is to prevent the growth of bacteria, fungi, and other microorganisms. Food processing needs to use preservation techniques ranging from simple to sophisticated, so any food process must acquire requisite knowledge about the methods and technologies. Common Methods of Food Preservation methods are chilling,freezing,sugaring, salting, canning,vacuum packing.Among the oldest methods of preservation are drying, refrigeration, and fermentation, modern methods include canning, pasteurization, freezing, irradiation, and the addition of chemicals.The documents, certifying food quality and safety are getting much more attention, together with the production supervision.If an economy or a company wants to maintain its good quality standards and market image, appropriate specification schemes should be developed for all its products. In conclusion, food preservation has been pivotal to our society since the beginning. Preservation has come from simple processes such as salting, to more complex preserving methods such as irradiation and chemical additives.

FSP005

ALOE BARBADENSIS MILLER EDIBLE COATING WITH *CYNODON DACTYLON* (BERMUDA GRASS) LEAF EXTRACT TO INCREASE THE SHELF LIFE OF FRUITS AND VEGETABLES

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Abstract

Edible coating is defined as a thin layer. It is an edible material applied to the fruit/vegetable surface in addition to or as a replacement for natural protective waxy coatings and to provide a barrier to moisture, oxygen. Presently there has been increased interest in using herbal extract such as lemongrass, oregano, Aloe vera, tulsi, mint, neem, cinnamon & clove as an edible coating material for fruits & vegetables driven by its beneficial properties. In that Aloe vera gel mainly composed of polysaccharides, has been recently explored as an edible coating owing to its antifungal activity. Aloe vera is the best edible and biologically safe preservative coatings for different types of foods because of its film forming properties, antimicrobial actions, biodegradability and biochemical properties. To improve the performance of edible coatings, various substances/chemical additives have been incorporated. Bermuda grass extract is a potential antimicrobial agent that could be used as a bio-based additive. The combination of aloe gel and Bermuda grass extract will increase the shelf life to the great extent. Present study was carried out to evaluate the ability of aloe vera gel based antimicrobial coatings to reduce/control the loss of post-harvest fruit/vegetable quality. Physical, chemical, sensory characteristics, fruit disease index and marketability will be analyzed at regular intervals during the storage period. The coatings will control the physiological loss in weight, ripening process (chemical changes, color development and softening of fruit/vegetable tissue) and decay to a great extend and thereby extended shelf life quality of the fruits/vegetables.

Keywords: *Aloe gel, Bermuda grass, edible coating, post-harvest shelf life***.**

FSP007

STUDIES ON THE FORMULATION OF CAKE USING GREEN BANANA FLOUR

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Abstract

The green banana (*Musa acuminata*) is dried using tray dryer, microwave dryer, freeze dryer. The banana was sliced at average size of 3mm and it is dried. The dried pieces are then size reduced and was sieved in sieve shaker at size of 212µm. The physical properties (pH, moisture, ash) Chemical properties like (Polyphenols, Anti-oxidants and Flavonoids) Nutritional properties (Carbohydrate, Protein, crude fiber) of the flour were studied. Among these different drying methods, freeze dried sample is regarded as the best sample to retain all the Functional, Chemical and Nutritional properties when compared with other two types of drying. So the freeze dried banana flour (BF) was substituted with wheat flour at varying proportions (2BF, 14BF, 6BF, 8BF and 10BF) to prepare cake samples. The physical (Moisture, pH, Specific volume), chemical (Anti-oxidants) and nutritional properties (Crude fiber) of the cake were analyzed. It is concluded that the cake made out of 8BF substitution had the overall acceptability and had maximum volume. The 10BF composition had higher nutritional values but had poor sensory properties. The texture profile of samples (2BF, 4BF, 6BF, 8BF, 10BF) was done and compared with the control sample which is made of 100% wheat flour. The fiber content and the antioxidant properties of the fortified samples increase upon addition of BF from 2% to 10% level whereas it shows a negative impact on the textural and sensory profile beyond 8% level of incorporation. Thus the 8% level shows highest nutritional and functional properties without showing negative impact on sensory and textural properties and is considered as the optimized sample. Thus 8% incorporated sample is considered as most acceptable both organoleptically and nutritionally.

Keywords*: Freeze dried, Anti-oxidants, Crude fiber, Green banana, Functionality.*

FSP008

IMPACT ON BLANCHING AND DRYING OF *MORINGA OLEIFERA* FLOWER AND ITS PROCESS PARAMETER OPTIMIZATION

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Abstract

Moringa oleifera flower, agricultural by-product is obtained from *Moringa oleifera lam*. Flowers are rich in potassium, calcium and good source of protein and dietary fibre. But, particularly in South India, flowers and fruit appear twice a year and there could be non-availability during off season. In order to promote the intake of flower and to increase the shelf life, *Moringa oleifera* flower needs efficient preservation technique. The objective was taken as to devise a preservation technique that is fast enough, reduces energy consumption and retains nutrients, which could be achieved by combined blanching and drying. The drying and quality characteristics of *Moringa oleifera* flower were investigated during combined blanching and drying process using response surface methodology (Box Behnken design). The process conditions like blanching temperature (70ºC, 80ºC, 90ºC), blanching time (2, 3, 4 min) and drying temperature (50ºC, 60ºC, 70ºC) were independent variables. The condition was optimized based on physical (color and rehydration ratio) and chemical (polyphenols, flavonoids, antioxidant activity) characteristics of dried samples. Obtained results stated that all independent process conditions had a significant effect on physiochemical characteristics of dried flower. The optimized conditions were drying temperature (60.64ºC), blanching temperature (79.48ºC) and blanching time (2.85 min).

Keywords: *Blanching, Drying, Box Behnken, Polyphenols, Rehydration ratio, Colour*

FSP009

A STUDY ON BRICK EVAPORATIVE COOLER FOR VEGETABLES: An eco-friendly storage facility for vendors

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Abstract

Vegetable vendors are those who buy vegetables from farmers, middle men, wholesale vendors and from farmers market to sell them to the general public. Vegetable vending is a unskilled labour as it does not require any special training or education to take it up. But the profitability is very less because of the perishability of the vegetables. Vegetables lose weight when exposed to sun and it has to be in humid condition to retain its natural weight. Being a business, which needs a lot of mobility it is easy for the vegetables to lose its freshness. A vegetable loses its value from harvest, storage, grading, transport, packaging and distribution. Due to the perishable nature of the vegetables 20% to 40% of the harvest goes to waste. The modern refrigerating technology used for the storage of vegetables is expensive to buy and run. But the need for a low-cost refrigerating storage system is a pressing need for the vegetable vendors. Humidity and temperature play a dominant role in the storage of vegetables. Thus, a survey was conducted among the vegetable vendors to know about the eco-friendly low-cost brick evaporative cooler which does not require any external power supply is a practical, affordable, effective and a brilliant model for today's need. The novelty in this research is to know the usefulness and the practical difficulty in it to bring into action.

Keywords: *Preservation, Vegetable vendors, Refrigeration, Evaporative – cooler, Eco-friendly, Low-cost*

5. Nanotechnology

NT003

AREA EFFICIENT MULTIPLIER USING NANO CMOS LOGIC STYLES

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Abstract

Fabrication of nanoscale materials has gained much importance in this era. Transistor miniaturization is considered as important parameter in Nanotechnology. Sustainability is maintained in Moore's law by the use of various CMOS transistor scaling techniques and silicon innovations. The combination of silicon innovations with other nanotechnologies provides a platform to design various transistor styles that low area and high speed. Today most of the processor requires very high speed of operation. Usually DSP processors are based on mathematical approaches. Compared to addition, multiplication process takes large amount of time thus reduces the speed of the processor, consumes some amount of power and area. So, it is required to design high performance multiplier to boost up the performance of those circuits and systems. In this paper, a high performing multiplier has been designed by using CMOS circuit families like pseudo NMOS and Pass Transistor Logic (PTL). The main objective is to reduce the transistor count and to increase the speed. Multiplier is designed and analyzed using Tanner EDA version 13. From the analysis report the area of pseudo NMOS and PTL multiplier is reduced by 15.08% and 33.62% respectively when compared with CMOS multiplier.

***Keywords**: Nanoscale, multiplication, CMOS Logic, Pseudo NMOS Logic, Pass Transistor Logic, Tanner EDA*

NT004

BIOSORPTION OF REACTIVE DYES BY GREEN SYNTHESIS OF NANOCOMPOSITE USING LEAF EXTRACTS AND THEIR CHARACTERISTICS

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Abstract

Textile industries consume large amount of water and also generate an equally alarming quantity of toxic dye rich water which can be reused for domestic purposes if treated efficiently. hence there is a requirement of cost effective and ecofriendly technique for the adsorption of dyes This paper presents a study on the batch adsorption of basic dye, reactive yellow and reactive blue, from aqueous solution onto green leaves nanocomposite and in order to explore their potential use as low-cost adsorbents for wastewater dye removal. The examined parameters such as concentration of dye, contact time, dose solution pH and temperature were traversed The removal efficiency of pollutants depends on solution pH and increases with increasing the composite content, with initial concentration of the pollutants, the temperature, and the dose of nanocomposites. The textile industry effluents have high pH and temperature which makes these nanocomposite more appropriate in treatment of these industry RhB percentage removal rose up to 96 % for adsorbent dosage of 0.25g/L The nano composite was characterized by Fourier transform infrared spectroscopy (FTIR), and X-ray diffraction (XRD) analyse The degradation of dye by synthesised nanoparticles was studied using employing UV–Vis spectroscopy. The XRD results revealed that the nanocomposites are crystalline in nature the adsorption process turned out to be spontaneous and exothermic. The kinetics study was done using pseudo first order, pseudo second order, intraparticle diffusion, Elovich plot and fractional power model, and the results indicated that the pseudo second order model was followed for the adsorption of Rhy Rhb dye on nanocomposite., which indicated that more than one mechanism was involved in the uptake of Reactive dyes onto plant mediated nanocomposite. (i.e) multilayer adsorption via chemisorption.

Keywords*: reactive blue-RhB reactive, yellow- RhY , bisorption,, CoPac-composite kinetics*

NT005

HIERARCHICAL STRUCTURE OF GRAPHENE OXIDE/ POLYANILINE COMPOSITE FLEXIBLE SUPERCAPACITOR

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Abstract

Supercapacitors are popular due to their higher power density than that of batteries, and are widely used in power electronics. It bridges the gap between electrolytic capacitors and rechargeable batteries. Electrochemical pseudocapacitors use metal oxides or conducting polymers. The graphene oxide/polyaniline (GO/PANI) composite, as a supercapacitor electrode material was prepared to increase the energy storage efficiency of the supercapacitor. The graphene oxide was prepared by the modified Hummers method. The GO/ PANI composite was prepared by In-situ polymerization of aniline in the presence of Graphene oxide. The performance of the electrode is evaluated using aqueous electrolyte at various current densities and scan rate. The electrochemical property and impedance of the composites are characterized by CV, GCD and EIS. Thus, the results show that the introduction of the GO and PANI, enhanced the electrode conductivity and stability, and then improved the supercapacitive behaviour of GO/PANI.

Keywords: *Supercapacitor, Electrochemical, Pseudocapacitor, Electrode, Batteries*.

NT006

HIERARCHICAL STRUCTURE OF GRAPHENE OXIDE/ MNO_2 ELECTRODES FOR SUPERCAPACITOR

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Abstract

A supercapacitor, also called an ultracapacitor, is a high-capacity capacitor with a capacitance value much higher than other capacitors, but with lower voltage limits, that bridges the gap between electrolytic capacitors and rechargeable batteries. To synthesize graphene oxide/polypyrrole (GO/PPy) composite, a sacrificial template is needed such as MnO2 through sacrificial template polymerization of pyrrole in the presence of GO and used for supercapacitor electrode. GO/MnO2 exhibited better electrochemical performance than the pure individual components. The electrode performance is evaluated using aqueous electrolyte at various current densities and scan rate. The sample which was prepared is electrochemically characterized using CV, GCD and EIS. Furthermore the GO/MnO2 electrode displays good rate capability and excellent cyclic durability. The specific capacitance of GO is measured as 23.4 Fg-1.

Keywords: *Supercapacitor, Electrochemical, Electrode, Batteries*.

NT007

FABRICATION OF ZNO – CARBONIZED COTTON YARN DERIVED HIERARCHICAL POROUS ACTIVE CARBON FLEXIBLE ELECTRODES

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Abstract

This work mainly focuses on the development of a novel type of chemically activated electrodes from the cotton yarn by carbonization and chemical activation. Chemical activation is employed in order to obtain high specific capacitance, energy and power density. The zinc oxide was prepared by the sol – gel method and the pH should be in the range of 9 and 11. ZnO/CCY electrode is prepared and it was stirred with a magnetic stirrer. The performance of the electrode is evaluated using aqueous electrolyte at various current densities and scan rate. The sample which was prepared electrochemically characterized using CV, GCD and EIS. This paper reports the development of highly flexible, less weight, and electrically conductive ZnO/CCY electrode with an electrochemical specific capacitance of 10.06 F g^{-1} at 150 mV s^{-1}. The ZnO powders were evenly developed over the carbonized cotton yarn. The porous nanostructure presented in ZnO powder presented enough potential electro-active sites. Additionally, it offered the good electrolyte adsorption. The well-developed ZnO/CCY fiber electrode showed enhanced electrochemical performance and stability from the analysis of CV, GCD and EIS. From the results, the fabricated flexible ZnO/CCY electrode can provide impending applications in the development of cable-type devices and next generation electrochemical supercapacitors.

Keywords: *Supercapacitor, Electrochemical, Pseudocapacitor, Electrode*.

NT008

FUNCTIONAL CHARACTERISTICS OF NANOCELLULOSEAND ITS POTENTIAL APPLICATIONS

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Abstract

Due to the renewable existence, anisotropic form, excellent mechanical properties, strong biocompatibility, customizable surface chemistry, and interesting optical properties, nanocellulose is of growing interest for a variety of applications related to the fields of material science and biomedical and Food Engineering. Here, key areas of nanocellulose research are explored, such as films and foams, surface modifications, nanocomposites, and medical devices. These tiny nanocellulose fibers, from versatile optoelectronics to tissue regeneration scaffolds, have immense potential in many applications. Extremely hydrated porous cellulosic soft materials with strong mechanical properties are nanocellulose hydrogels. These cellulose-based gels can be manufactured from hydrophilic, sustainable, biodegradable, and biocompatible bacterial or plant cellulose nanofibrils. Different areas where nanocellulose is used as a potential for applications are discussed in this paper.

***Keywords*:** *Cellulose, Nanocellulose, Applications, properties, Nanosized components.*

6. Advanced Separation Technologies

ASP001

A REVIEW ON MEMBRANE PROCESSES IN DAIRY TECHNOLOGY

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Abstract

The dairy industry is regarded as an important food industry that provides everyone with different nutrients containing dairy products. In addition to these nutritional qualities, the dairy industry is seen as a strong source of other industries' raw materials. Most notably, the dairy industry utilizes environmentally friendly innovations that conserve energy. Membrane separation technology is one of those that also focuses on a cost-effective and environmentally sustainable way that can be widely implemented for many useful purposes in the dairy industry. Technological developments related to the production of new membranes, process engineering improvements and a greater understanding of the functionality of milk components have expanded the range of processes of membrane separation to cover the entire milk composition spectrum. Advanced membrane processes make it possible to recover and purify milk components. It also improves the shelf life of milk without heat treatment exposure, standardizes the milk components for the tailoring of milk products and increases the yield.

Keywords*: Membrane separation, Dairy Processing, Milk purification, environmentally friendly*

7. Catalysis & Reaction Engineering

CRE001

PERFORMIC ACID SYNTHESIS IN A TEFLON TUBE MICRO REACTOR

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Abstract

Continuous production of Performic acid (PFA) has drawn major attention as it has wide applications in Chemical, Food and Oil industries because of its oxidizing properties. Micro reactors are small in size with greater mass and heat transfer. In the current study performic acid is synthesized in a continuous flow micro reactor made of polytetrafluorethylene capillary micro reactor with and without heterogeneous catalyst and reactants being formic acid and hydrogen peroxide.The major focus of the present study is to analyze the effect of temperature, concentration of hydrogen peroxide and heterogeneous catalyst (Amberlite) on formation of PFA. The experimental results revealed that the conversion of PFA is influenced by increment in temperature and catalyst concentration. The use of solid catalyst lead to maximum formation of PFA within short residence times. The heterogeneous catalysts are beneficial over homogeneous catalysts as they decrease corrosion and segregation of catalyst. Equilibrium conversion to PFA is attained in 8 min at 40^0C with amberlite.

Keywords*: Performic acid, capillary micro reactor, heterogeneous catalyst, amberlite.*

CRE003

PERFORMANCE IMPROVEMENT AND REDUCTION OF EXHAUST EMISSIONS IN CATALYTIC CONVERTER

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Abstract

The automotive sector is currently developing towards the growth of GDP and prosperity of most developing nations. In our country, private transport has become a necessary part of modern life as more consumers are directing their attention towards it. However, the growing automobile sectors lead to problems associated with the clean air which is imperative for both the present and future generations. The pollutants released from automobiles like HC, NOx, CO, CO2 has to be maintained significantly, to avoid ecological degradation. The present Federal Test Procedure depicts that vehicles emit nearly 70% of harmful emissions like CO and HC during the very few minutes following ‘‘cold start”. In this regard, the countries worldwide have started implementing rigorous control norms to handle increasing pollution trend from vehicles. In order to improve the performance and to reduce exhaust emissions, suitable methods have to be incorporated. Hence, in the present review a detailed study has been carried out with the operating parameters and catalytic converter, so that its performance can be improved and exhaust emissions were reduced. In addtion to that a low-cost three-way catalytic converter to be developed using an alternative metallic oxide as an oxidizing agent in place of conventional catalyst and testing it on an IC engine.

Keywords*: Pollutants , Performance , Emissions , operating parameters ,catalytic converter.*

8. Chemical Process Technology & Safety

CPTS001

NUMERICAL AND EXPERIMENTAL HEAT TRANSFER INVESTIGATIONS OF A DOUBLE PIPE U-TUBE HEAT EXCHANGER EQUIPPED WITH TWISTED TAPE AND CUT TWISTED TAPE INTERNALS

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Abstract

For several decades, the use of heat exchangers for both heating and cooling applications, has been established in industries ranging from process to space heating. Out of the various types of heat exchangers, U-tube heat exchangers are preferred owing to their abilities to handle larger flowrates and their simplicity in construction. U-Tube exchangers are often equipped with innards of various forms which facilitates higher heat transfer rates and thermal efficiencies. Although higher heat transfer rates been established with the addition of internals, there is a lack of coherence on the underlying complex physical phenomena such as heat transfer boundary layers and turbulence characteristics. Over the last few years, a considerable progress has been achieved in the arena of Computational Fluid Dynamics (CFD), a powerful and effective numerical tool that is used to simulate a wide range of multiphysics problems. In the current study, the effect of twisted and cut-twisted tape inserts on heat transfer enhancement and pressure drop in a counter flow double pipe U-tube heat exchanger has been investigated using the numerical and experimental approach. This has been compared with a bare double pipe U-tube heat exchanger in the absence of internals. Physical parameters such as heat transfer rate, overall heat transfer coefficient (HTC), pressure drop, Nusselt number are determined for a range of Reynolds numbers with water as working fluid.

Keywords*: Heat exchangers, CFD, Heat transfer, Twisted tape internals, Cut-twisted tape internals, Counter-Flow*

CPTS004

SCADA BASED REAL TIME MONITORING AND CONTROL FOR PROCESS CONTROL PLANTS USING INDUSTRIAL IOT

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Abstract

In this paper we have developed real time process station monitoring with control using IIOT. Moreover the parameters in the process industries like Level, Flow and temperature can be monitored and controlled using cloud storage also presented. Cloud refers to accessing computer information and software applications internet connectivity. We have used 'ThingSpeak' IoT analytics platform to aggregate, visualize and analyze all our real time readings of a process control plants. In this system the parameters like flow, temperature, pressure, level can be monitored and controlled wirelessly through wireless devices. In case of any emergency, an alarm system is used to intimate the conditions to the end user. The wireless transmitter has been incorporated in the process station to send data periodically and the receiving section consists of a Wi-fi module in order to receive the transmitted data, they are then stored in a cloud platform through which the data can be accessed as well as control wirelessly by the remote devices such as PC, mobile phones, tablets, etc. Moreover, it can be integrated to automation tools like SCADA, PLC with bidirectional mode of control to ensure operational safety and efficiency with recent automation protocols.

Keywords: *HUB , IoT, Cloud, SCADA, PLC , ThingSpeak.*

CPTS005

DETERMINATION OF CORRECT SHADE OF DYE COLOUR IN TEXTILE INDUSTRY USING LABVIEW

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Abstract

In the industries, the colour and the quality of the dye plays a vital role. The most challenging aspect is obtaining the required shade on a given substrate. The dye preparation for the required shade is obtained by mixing the colours in the required proportion. In the existing method, this is done manually by the experienced skilled labour. The manual process requires manpower and most of the cases the required shade may not be obtained. It is very difficult to obtain the minute difference in the shade using human vision. If the required shade is not obtained it may lead to loss due to rejection. This project aims to improve the profit by bringing the required shade without any deviation from the required shade. NI Vision Assistant in LabVIEW is employed to obtain the required shade. Here proper shade is obtained by mixing the three basic colours in proper proportion.

Keywords*: Colour, RGB, Arduino Controller, Stirrer, LabVIEW, NI Vision Assistant*

CPTS006

DESIGN AND ANALYSIS OF HYDRODYNAMIC CHARACTERISTICS IN ROTATING PACKED BED REACTOR

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Abstract

Rotating Packed Bed reactor (RPB) is a novel equipment which holds a packed bed fixed within a hollow tubular casing. It uses centrifugal force in addition to other conventional principles of packed bed reactor to increase mass transfer and heat transfer. RPB reactor has been in research for its efficient usage /application in several industries. RPB is ideal for process intensification, which aims to integrate multiple process/operations to enhance internal mass, heat transfer and kinetics at micro-level and thereby improve mixing. Rotating Packed Bed reactors significantly reduce the equipment volume and improves selectivity. These merits can effect intense micro mixing and internal mass, heat transfer. It can also provide more contact between reactant and catalyst and thus resulting in more product formation. Desired products can also be produced by adjusting the variable speed of rotation. The mass-transfer coefficient is greatly influenced by the hydrodynamics of gas and liquid phase in the RPB, which is very different from that in the conventional column. In the proposed work, it has been intended to study Superficial Velocity and Gas Holdup for different concentrations of Feed. Higher the gas Holdup, greater will be the conversion. RBP reactors also have come up with some disadvantages like channeling of inlet stream, side reactions, tedious heat transfer to/from the reactor and control of temperature gradient.

Keywords*: Packed bed reactor; Rotating Packed Bed reactor; Mass and Heat transfer; Process intensification; Mixing*

9. Polymers, Composites & Material Technology

PCM002

A Review on Recent Developments in the Recycled Aggregate Concrete

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Abstract

The economical and the best way to overcome the shortage of natural resources for the manufacture of products is recycling. There are many types of concrete produced around the world by reusing and recycling the materials. Recycled concrete is produced by replacing the materials of concrete partially using recycled materials. The Construction and Demolition (C&D) waste shall be used as recycled materials, which reduces the disposal of wastes. The disadvantage of this type of concrete is poor strength and durability. Researches have been going yet in the recycled concrete to overcome those disadvantages. This paper reviews the recent developments that were made by the researchers in the Recycled Aggregate Concrete (RAC). New methods have been introduced by many research programs to improve the mechanical and durability characteristics of RAC. The characteristics discussed in this paperarephysical, chemical, mechanical, and durability properties of RAC.

Keywords: *Recycled aggregate concrete, construction and demolition waste, recycling, superplasticizer, and Compressive strength.*

PCM006

EXPERIMENTAL STUDY ON BEHAVIOUR OF HIGH PERFORMANCE CONCRETE BY USING METAKAOLIN AS AN ADMIXTURE

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Abstract

Concrete is probably the most extensively used construction material in the world. The addition of mineral admixture in cement has dramatically increased along with the development of concrete industry, due to the consideration of cost saving, energy saving, environmental protection and conservation of resources. However, environmental concerns both in terms of damage caused by the extraction of raw material and carbon dioxide emission during cement materials. High Performance Concrete (HPC) is the latest development in concrete. It has become more popular these days and is being used in many prestigious projects. Mineral admixtures such as fly ash, rice husk ash, metakaolin, silica fume etc are more commonly used in the development of HPC mixes. Addition of such materials has indicated the improvements in the strength and durability properties of concrete. The utilization of calcined clay, in the form of high reactivity metakaolin (HRM) in concrete has received considerable attention in recent years. The present paper deals with the study of properties namely workability, compressive strength and durability of M60 grade HPC mixes incorporating different percentages of high reactivity metakaolin by weight of cement along with some suitable super plasticizer. The results of the study indicate that the workability and strength properties of HPC mixes improved by incorporating HRM up to a desirable content of 7.5% by weight of cement. HPC mixes have also indicated better resistance to the attacks of chemicals such as chlorides and sulfates when the HPC mixes were exposed to theses chemical for 180 days.

Keywords: *Metakaolin, High Performance Concrete, Fly ash, Compressive strength, Split tensile strength, Flexural strength*

PCM008

A STUDY ON MECHANICAL PROPERTIES OF SYNTHETIC FIBER REINFORCED POLYMER COMPOSITES

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Abstract

In the technological world, retrofitting of damaged structures has been emerged as an essential need and a common technique. For the indent of retrofitting, fiber reinforced polymer composites are used. Due to its beneficial properties, they are used in massive work fields. Fiber reinforced polymers holds high strength to its weight ratio. In the area of civil engineering, FRP composites are habituated to strengthen the existing damaged RC structures. In the extended earth, there are numerous kinds of fibers, among them synthetic fibers own high strength were every fiber have its own properties. This paper recapitulates the mechanical properties that include tensile and flexural strength and also impact energy value of synthetic fibers. Synthetic fibers taken for inspection are aramid, glass, carbon and basalt fibers in mat form. Through this review the synthetic fiber which holds high tensile strength, along with high flexural strength and also fiber with high impact energy can be discovered. This paper also illustrates the most standard methods used for laying the fiber reinforced polymer (FRP) composites.

Keywords: FRP Composites, Lay-Up Method, Mechanical Properties, Synthetic Fibers, Testing.

PCM012

STUDY ON PARTIAL REPLACEMENT OF SAND WITH FOUNDRY SAND AND COPPER SLAG

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Abstract

Copper slag is one the component that can be considered as an industrial waste. This paper presents the impact of concrete as a fine aggregate substitute using foundry sand and copper slag. The concrete grade M20 was selected and IS methods was used for designs. The properties of foundry sand and copper slag has been studied for mix design. The different strength of concrete such as compressive are tested for different fine aggregate replacements using 0%, 15% and 30% foundry sand and copper slag. The maximum compressive strength of concrete was reached when the fine aggregate was replaced by 15% at 7 and 28 days. Making concrete from recycle materials saves energy and resource conservation which contributes to safe sustainable environment.

Keywords: *Copper Slag, Foundry Sand, Sand Replacement and Compressive Strength.*

PCM013

A STUDY ON MATERIALS USED FOR LOW COST HOUSING CONSTRUCTION IN INDIA

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Abstract

One of the basic need for human survival is Shelter. But in India, where population is very high and the number of houses are few to accommodate. Generally, construction work consumes more money. So, building houses for low income families poses a great challenge. Constructing own house is still a dream for LIG and middle class peoples. To reduce this, the Low Cost Housing concept is introduced. Low Cost Housing is a new concept which deals with effective budgeting and following of techniques which helps in reducing the cost construction through the use of locally available materials along with improved skills and technology without sacrificing the Strength, Performance and life of the structure. It provides us a challenge to use the natural materials to reduce the wastage obtained from industries and environment pollution. And also using this cost effective technology will not only save money but also reduce co_2 emission, save time and faster construction. In this study, Low cost building materials available are presented and potential for the materials to be used as alternative building materials was discussed.

Keywords: low cost housing, Industrial waste, environmental waste, cost, effectiveness, Rural India.

PCM014

BIOACTIVE PHYTOCHEMICALS SYNTHESIS: SOURCE, PREPARATION AND CHARACTERIZATION

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Abstract

Plant extracts have been widely used for their remarkable therapeutic properties; various researches have been undertaken to exploit such properties for application in modern medicine. The current work involves the extraction of anticancerous substance Chavicol from the betel leaves using the Soxhlet Apparatus. Soxhlet Extraction method was widely used for the essential oil extraction from plants. This method has the ability to preserve the original characteristics of the plants. Experimental observations indicated that the extract of Piper betle leaf consists of a wide variety of essential phytochemicals such as amino acids, carbohydrates, triterpinoids, and saponins etc., it was found that, keeping heating time as constant, the volume of essential oil produced can be increased. Chavicol was synthesized using ethanol at different temperatures. Minimum and maximum yield temperatures were determined. Gas Chromatography and Mass Spectroscopy were found to be the most appropriate method for identification of all the components of the oil even if present in smaller proportions. The essential oil thus extracted from plants using the lab scale Soxhlet Extraction method can be produced on large scale to include this as one of the ingredients for the manufacture various products like cosmetic lotions, hair rinses, soaps,body oils, room sprays and perfumes etc.

Keywords: *Essential Oil, Chavicol, Ethanol, Soxhlet Apparatus, Gas Chromatography.*

PCM015

A STUDY ON BEHAVIOUR OF COLD FORMED STEEL SECTIONS BASED ON FASTENERS

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Abstract

Cold formed steel sections are widely used in developed countries for a wide range of applications like roofs in the form of deck sheeting and also as structural elements like beam and column. In a developing country like India, where use of conventional hot rolled steel sections itself is in developing stages, the use of cold formed steel is very less. But if cold formed builtup sections are developed efficiently, cold formed sections can be used for wide range of applications where spans are minimum and fewer loads are acting. Structural behaviour of cold formed sections based on the different type of fasteners was studied in this paper. Behaviour of cold formed sections mainly based on welding and bolts are compared and studied. Strength aspects of cold formed sections due to different types of fasteners along with their mode of connection was studied. Studies shows significant changes in behaviour of similar members were obtained by varying the type of fasteners.

Keywords: *Steel, hot rolled steel, cold formed steel, fastener, welding, bolting.*

PCM016

DEVELOPMENT OF BIODEGRADABLE NANO FILM

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Abstract

Interest in developing biodegradable composite films that can incorporate bioactive substances and have active role in food packaging, has been growing in the last decades. Curcumin, known for its antimicrobial and antioxidant activity has been proposed as an active molecule that can be incorporated into biodegradable films. This work proposes the development and characterization of composite films made from potato starch and Aloe Vera gel incorporated with curcumin-loaded starch nanoparticles. The effect of the curcumin-loaded nanovehicleson the mechanical, barrier, and thermal properties of the composite films was studied. In this sense, the study noted that inclusion of highly hydrophobic curcumin leads to a reduction of the film's water vapor permeability while enhancing the film's tensile strength. Finally, from the release profiles of curcumin from the composite film in different food simulants, it is observed that it is possible to control curcumin release in different foodstuffs by changing the characteristics of the nano vehicles incorporated.

Keywords: *potato starch, curcumin, aloevera, nano film, packaging*

PCM017

NANOCELLULOSE IN FOOD PACKAGING APPLICATIONS

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Abstract

There is a growing appetite for the discovery of innovative and environmentally friendly sustainable packaging materials with superior physical, mechanical and barrier properties. Materials commonly used in packaging for foodstuffs, drinks, medical and medicinal products as well as in industrial applications are non-degradable and as a result, they pose environmental contamination. This is possibly due to bio-based materials without a proper design being used in food packaging applications. Though biopolymers are bio-degradable they have certain disadvantages.When a nano size particle is incorporated, it can significantly improve the performance. So, the main aim of cellulosic packaging is to improve and promote economic health. This article aims at the development of nanocellulose incorporated polymers and reports about the improvement in its properties and its various applications.

Keywords: *Nanocellulose films, film properties, Structure, Sustainable packaging, Packagingapplication*

10. Renewable Energy

RE002

ANALYSIS OF ARISING ADVANCEMENTS IN THE HYDROPOWER AREA

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Abstract

The paper surveys ongoing innovative work exercises in the field of hydropower innovation. It covers arising and trend setting innovations to moderate stream hazards just as arising magneto-rheological control procedures. Late exploration discoveries on stream insecurities are additionally introduced, particularly concerning liquid structure collaboration and transient working conditions. As an incredible number of the current huge scope hydroelectric offices were developed many years back utilizing advances that are presently viewed as old, innovations to accomplish the digitalisation of hydropower are likewise dissected. Advances in the electro-mechanical parts and generator configuration are introduced; their expected job to adjust hydropower to the current working conditions is likewise featured. The content investigates current endeavours to progress hydropower activity, primarily as far as European ventures. It gives a nitty gritty outline of the new endeavours to build the operational scope of water driven turbines to arrive at extraordinary degrees of adaptability, a subject of a few late exploration projects. Variable speed hydropower age and its application in siphoned stockpiling power plants are introduced in detail. In addition, progressive ideas for hydroelectric energy stockpiling are likewise given the investigation zeroing in on submerged hydro stockpiling and hydropower's hybridisation with quick energy stockpiling frameworks. Endeavours to limit hydropower's ecological impression are likewise introduced by means of the use of limited scope and fish-accommodating establishments.

Keywords: *Hydropower digitalisation, technology development, hydraulic turbines, pumped hydropower, storage small-scale hydropower, hydraulic machines*

RE006

ZERO CARBON HYDROGEN HYDROGEN OXYGEN GAS BURNERS

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Abstract

Liquefied Petroleum Gas (LPG) consists of propane (C3H8) and butane (C4H10) forms the light hydrocarbon compounds. LPG directly depends on the Fossil fuels extraction and also the byproduct of oil and gas industries. LPG finds numerous applications in Petrochemical industries and auto gas. It is also used for Heating and Cooking. Cooking system using LPG is constructed with LPG cylinder, controller for controlling the pressure and a tube to connect pressure controller with the burner. From the study taken by UNDP revealed that average LPG supply per capita is 60 Kg which equals to the half the amount of current production in the world. As the fossil fuels are currently in extinction it is not possible to supply these much quantity in future. LPG burner is highly explosive and as it is extracted from nonrenewable resource adequate amount of supply of LPG becomes an issue. Moreover due carbon deposits inside the burner needs frequent replacement. It releases CO mixtures of about 20 to 200 ppm which cause an unhealthy condition for human beings. Leakage of LPG makes the entire system to explode. To overcome the disadvantages pollution free Oxy Hydrogen gas burners are proposed which has no Carbon deposits over the burners and vessels. This paper presents a novel idea of designing an efficient Hydrogen Hydrogen Oxygen (HHO) cooking gas burner which replaces the normal LPG burner for cooking. Oxy hydrogen gas is produced from water which forms a renewable resource. The Electronic pulse width modulation circuits are designed to maintain the temperature of dry cells and it is used to control the flow rate of the gas. The Oxy hydrogen gas is produced from the dry cells, filtered and passed through a flash back arrester which is the safety material to prevent the back fire. It is then it is

passed through the specially designed HHO cooking burner. From the nozzle of the burner the gas flows out and it is fired for cooking purposes.

Keywords: *Oxy Hydrogen gas, Electronic pulse width modulation, Carbon deposits.*

RE007

SOFT COMPUTING BASED SHE-PWM AND SINUSOIDAL PWM TECHNIQUES IN CASCADED MULTILEVEL INVERTER FOR RENEWABLE ENERGY SYSTEM

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Abstract

Multi-Level Inverters (MLI) are the state of the art technology used for harmonic reduction in inverters. Selective Harmonic Elimination-Pulse Width Modulation (SHE-PWM) technique and Sinusoidal PWM (SPWM) technique are the preferred modulation technique for improvement of harmonic profile in Symmetric Cascaded Multi-Level Inverter (SCMLI). The objective function of SHE-PWM is a challenging task in multilevel inverter as the function is non-transcendental in nature with multiple local minima. Thus Bio-geographical Based Optimization (BBO) and Particle Swarm Optimization (PSO) algorithm are applied to optimize the switching angles of SHE-PWM technique. The simulated harmonic spectrum of seven- level SCMLI with SHE-PWM technique is compared with the SPWM technique. SHE-PWM technique has completely eliminated the specified lower order harmonics with the harmonic component h5 and h7 to less than 0.8% .SPWM technique had minimized the overall THD at the cost of increase in amplitude of lower order harmonics h7 to 2.%. SHE-PWM is superior in performance when compared to SPWM technique due to elimination of lower order harmonics at lower switching frequency.

RE008

CONVERSION OF ALGAE INTO BIO-CRUDE VIA HYDROTHERMAL LIQUEFACTION: COMPARATIVE STUDIES ON DIVERSE SPECIES AND OPERATING CONDITIONS

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Abstract

The macroalgae species of *Gracilaria corticata, Turbinaria conoides, Sargassum wightii* and microalgae *Nannochloropsis sp., Chlorella vulgaris* species are collected from Gulf of Mannar for bio-crude production under Hydrothermal Liquefaction (HTL) condition. The effect of influencing parameters on the yield of bio-crude have been investigated. All the 5 algae species were processed under HTL in the temperature range between 300 and 350 °C, residence time 15-60 min has been studied. It is found that the bio-crude yield for *Nannochloropsis sp.* and *Chlorella vulgaris* was 38.2 and 36.2 wt.%, respectively with higher heating value (HHV) of 35.92 and 34.3 MJ/kg while *Gracilaria corticata, Turbinaria conoides, Sargassum wightii* yields about 29.63, 18.46, 16.33 wt.%, with higher heating value (HHV) of 16.9, 20.3 and 33.63 MJ/kg. Based on the suggested reaction pathway, the identification of the existing component in their respective source of bio-crude was done using GC-MS. The composition of triglyceride and fatty acids in individual species are responsible for the formation of bio-crude. The results from GC-MS showed the occurrence of amides and heterocyclic groups due to protein presence. Moreover, the aqueous solution can be recycled as loading solvent to enhance the bio-crude yield significantly.

Keywords: *hydrothermal liquefaction; bio-crude; algal biomass; high heating value; thermochemical conversion.*

RE010

APPLICATIONS OF RENEWABLE ENERGY IN DOMESTIC AND INDUSTRIAL SECTOR

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Abstract

This article considers the possibility of using renewable energy sources to provide energy needs to the enterprise. The use of renewable energy sources rapidly increases as alternatives to conventional sources .It is proposed to reduce energy costs through use of non- conventional energy and renewable energy sources as a prospective area of world energy. Renewable energy is generated from natural sources such as sunlight, wind, tides and geothermal heat which are renewable. The dessert has been set aside for solar power projects sufficient to generate 700 to 2100 gig watts. Fossil fuels will deplete one day and the industries must turn for renewable sources as possible. Moreover these fuels propose a great threat to environmental balance and are a cause for ecological hazards. Renewable energies have long been one of the priorities of public authority not only to avoid the expenditure of hydrocarbons but also to preserve the environment. This double objective requires a lot of sacrifices and above all awareness raising for the benefits of people in order to reap the benefits by using this kinds of energy. The fields of study are solar energy wind energy thermal hydropower biomass with their applications.

RE011

RENEWABLE ENERGY

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Abstract

Energy is essential to our society to ensure our quality of life and to underpin all other elements of our economy. Renewable energy technologies after the promise of clean, abundant energy gathered from self-renewing resources such as the sun, wind, earth and planets. Renewable resources currently account for 10% of the energy consumed in the united states. Wind, solar, biomass and geothermal technologies are soft-effective today in an increasing number of markets, and are making important steps to broader commercialization. They improve access to energy for most of the population, they also reduce emission of local and global pollutants. This review energies: therefore, based on the benefits of these energy resources, the use of renewable energies, instead of fossil fuels will be a good solution for the control of the environment, social and economic problems of our communities.

Keywords*: Renewable energy, cost efficiency, benefits, solution.*

RE012

PRUNUS DULCIS SHELL DERIVED CARBON FOR A HIGH PERFORMANCE SUPERCAPACITOR

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Abstract

Supercapacitor has gained its attention due to its fast charging/discharging speed, high power density and long-term stability than the normal batteries. Activated carbon (AC) based electrodes for supercapacitors provides higher specific capacitance. Therefore, activated carbon electrode was prepared from *Prunus dulcis* (almond fruit) shell by carbonization using muffle furnace. Carbonized *Prunus dulcis* fruit shells were chemically activated by using KOH. The addition of KOH helped to increase the porosity of fruit shells and enhanced absorption of electrolyte. The supercapacitor electrode was prepared by coating activated carbon powder on graphite pencil lead tip. The performance of the electrode was evaluated using 6 M KOH electrolyte at various current densities and scan rate. The sample which was prepared was electrochemically characterized by using CV, GCD and EIS. From this method the suitability of the material as an electrode can be understood. The specific capacitance of the prepared electrode was measured as 55.56 Fg-1, 66.67 Fg-1, 83.33 Fg-1, and 95.24 Fg-1. Thus the activated carbon electrode provided a higher specific capacitance of 95.24 Fg-1 at 250 µA. The better electrochemical performance was due to enhanced surface area and high specific capacitance.

Keywords: *Activated carbon, Almond fruit shells, Electrode, Supercapacitor, Biocomposite*

RE013

POROUS CARBON WITH HIGH NITROGEN CONTENT OBTAINED FROM *ZIZIPHUS JUJUBA* NUTSHELL FOR ALL SOLID-STATE SUPER CAPACITORS

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Abstract

Porous carbon is used as an electrode in energy storage and conversion mechanism, as the electrode used in supercapacitors are costly. Here, the development of highly porous carbon-based electrode is from *Ziziphus jujuba* seed, in which the seed content is abundant than the fruit part. This material has been chosen in order to make the electrode more economical and sustainable. The carbonized *Ziziphus jujuba* seed (CZJS) electrode has been prepared by applying a two-step process of carbonization and KOH activation respectively. The electrode performance was evaluated with aqueous electrolyte using cyclic voltammetry, galvanostatic charge discharge method and electrochemical impedance spectroscopy at constant scan rate and current density. From the specific capacitance value measured we are able to find the appropriateness of the material to be used as an electrode. The high electrochemical performance of *Ziziphus jujuba* seed is due to its highly porous structure. Thus the CZJS electrode exhibited a specific capacitance of 55.56 Fg-1, 47.62 Fg-1, 16.67 Fg-1, and 5.56 Fg-1 at various current densities.

Keywords: *CZJS, porous, carbonization, KOH activation, specific capacitance, electrode*

RE014

BIODIESEL PRODUCTION FROM WASTE COOKING OIL THROUGH TRANSESTERIFICATION USING NOVEL DOUBLE LAYERED HYDROXIDE CATALYST

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Abstract

Mg-Al hydrotalcite was synthesized using co-precipitation aqueous solution of $Mg(NO_3)_2.6H_2O$ and $Al(NO_3)_3.9H_2O$ followed by hydrothermal treatment at 110°C for 12 hours. In layered double hydroxide, the divalent cations in the brucite like layers are reinstated by trivalent cations, also this is known as hydrotalcite. Hydrotalcite plays an important role as catalysts for many process and as various other applications. Hydrotalcite has various applications as anion exchanger, antacid in medical field, and also in various waste water treatment methods. This novel catalyst can be used effectively in organic chemical synthesis and processes like Aldol condensation, Claisen–Schmidt condensation, Knoevenagel condensation and in various oxidation reactions. In this study, Mg-Al hydrotalcite was utilized for transesterification of waste cooking oil. Biodiesel was synthesized through single stage transesterification process using methanol and Mg-Al hydrotalcite by continuously stirring for 30 min at 60-65°C. The suspended impurities in waste cooking oil are first removed using a filter and heated to 120°C to remove moisture. The objective was to maximize the yield of biodiesel by varying the process conditions (methanol-to-oil molar ratio, temperature, time) and heterogeneous Mg-Al hydrotalcite catalyst. Biodiesel conversion was determined by estimating and evaluating methyl ester content (FAME, %) by gas chromatography with flame ionization detector (FID).

Keywords: Transesterification, Mg-Al hydrotalcite, waste cooking oil, fatty acid methyl ester.

RE015

IMPROVED BATTERY MANAGEMENT SYSTEM FOR HYBRID ELECTRIC VEHICLE USING SUPERCAPACITOR

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Abstract

Hybrid Electric Vehicle utilizes secondary source of electrical energy for recharging the battery during vehicle operation. Regenerative power which is obtained from the conversion of kinetic energy of motion into electrical energy and returns to battery is one of the important sources of improving fuel efficiency. Battery is the major source in an Electric Vehicle (EV), where mileage of EV depends on it and also the power obtained from battery gets consumed by the various loads in EV other than motor. Such energy consumption also becomes barrier for the main rotary part to consume its energy from battery units. To enhance the battery performance, in this paper the battery is energized by the regenerative power and to eliminate the power consumed by other loads from battery super capacitor is used to provide energy for mini loads other than motor. Super capacitors are the high energy capacitors which can store an incomparably greater amount of energy than conventional capacitors and it has the potential to improve the hybrid Electric Vehicle energy storage system**.**

Keywords: *HEV, Regenerative power, Super capacitor, BMS*

RE018

EXPERIMENTAL STUDY AND NDT ON COMPRESSED EARTH BLOCKS USING AGRICULTURAL AND INDUSTRIAL WASTE

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Abstract

In most regions of the world, Soil is available as one of the construction material. Compressed Stabilized Earth Block (CSEB) is an emerging technology which dates back towards the traditional building materials. In developing countries like India mud technology is economical and most efficient sustainable technology for low cost affordable housing. CSEBs are compressed manually or hydraulically by using some mud block making machines. The present study is intended to analyze the feasibility of improving the properties of CSEB by using low cost stabilizers and industrial waste which are non-hazardous to the environment. The primary aim of this research is to find suitable low cost stabilizers used for preparation of CSEBs with regard to strength, durability, economy and availability of materials. The soil chosen for preparing compressed block was the Red soil available locally. Stabilizers used for the study include Cement, GGBS, Rice husk ash were added in different proportions for the preparation of compressed blocks 240x240x90 mm size. After conducting tests on compressed blocks with different proportion it was to found that the best proportion in terms of strength, durability, water absorption andeconomy.

Keywords: *CSEB, low cost stabilizers, industrial waste.*

11. Petroleum Refining & Petrochemicals

PRP001

PERFORMANCE AND EMISSION CHARACTERISTICS BETWEEN DIESEL AND BIODIESEL OF FATTY ACID METHYL ESTER

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Abstract

In this study, the potential of bio-fuel obtained from an fatty acid methyl ester was explored and compared with that of diesel fuel—bio-fuel produced by thermolysis process to break the chemical bonds and reduce the viscosity. The bio fuel fatty acid methyl ester properties were determined by ASTM (American Society for Testing and Materials). The blend is fed to single-cylinder 4-stock IC-engine, and the engine performance was examined under various load condition. The emissions were measured using a dynamometer. As shown in the results, the obtained maximum engine power output has shown a negligible dependence on the fuel type. A significant reduction in the carbon monoxide (CO) and Hydrocarbon (HC) emissions were achieved using the biofuel compared to the pure diesel. However, a slight increase in nitrogen oxides (NOx) was noticed.

Keywords: *Bio-fuel, Thermolysis, IC-engine, Performance, Emission*

12. Waste Water Treatment, Reuse & Recycle

WWT002

DEGRADATION OF MODEL TEXTILE WASTEWATER CONTAINING AZO DYE USING UV-VISIBLE PHOTOCATALYTIC TIO2 NANOPARTICLES

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Abstract

The photocatalytic degradation of commercial textile azo dye, namely C.I Acid red 2 also called as methyl red has been studied. TiO_2 nanoparticles doped with zinc nitrate were synthesized by sol-gel technique and characterized by SEM, XRD and FTIR techniques. The nanoparticles were found to be crystalline with a size of around 58 nm to 192 nm. The effect of visible light irradiation time on photodegradation was investigated. Optimum pH for degradation of the dye solution was determined. The repeatability of photocatalytic activity of the photocatalyst was also tested. The degradation was followed monitoring the change of azo dye concentration by UV-Vis spectroscopy. Degradation of 100 ppm methyl red solution with 0.2 g of photocatalyst was carried out for various time intervals. Maximum degradation of 85% was obtained for a time of 180 min. From kinetics studies it was observed that the degradation of methyl red followed pseudo first order kinetics. Results show that the use of an efficient photocatalyst and the adequate selection of optimal operational parameters may easily lead to a complete decolorization of the aqueous solutions of azo dyes.

Keywords: *photocatalytic degradation, azo dyes, TiO2 nanoparticles, dopant, kinetics*

WWT003

E - WASTE MANAGEMENT: AN EMPIRICAL STUDY ON RETIRING AND USAGE OF RETIRING GADGETS

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Abstract

Electronic waste includes various electronic gadgets and appliances which have grown old like computers, TVs, refrigerators, mobile phones, MP3, pagers etc., which are actually dumped by their original handlers in past. It comprises of various dangerous materials which impact the environment negatively and overall damages the health of human beings if not properly disposed or taken care of. Many Governments and Organizations of various countries are trying to be environmentally friendly and therefore have come up with environmentally sound choices and approaches for E-waste management to manage the ever-growing risk towards the environment and human well-being. With regards to reaching the above aim, this paper consists of E-waste alignment, cataloging, Worldwide and Indian E-waste situations, forecasts of recyclable or recoverable materials found in the E-waste. Also, here we have discussed about the best available practices for recovering and recycling processes which is followed by the facts that if there are any environmental and occupational hazards to it. In developing countries, any awareness of the health hazards and environmental threat, which has been postured by e-waste is effectively non-existent. And if we keep on doing nothing, these issues will take a more serious non-returnable turn. In demand to do best, we should defend public health and the environment in a way that doesn't burden developing countries, therefore, policy makers of all countries should be willing to primarily reform the method to e-waste management and to make them aware about it.

Keywords *: E–waste management, Hazardous waste, E-waste, Electronic scraps, environment*

WWT007

WASTE WATER TREATMENT TECHNOLOGY

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Abstract

Nowadays many water resources are polluted by household, agricultural and industrial processes. Public concern over the environmental impact of wastewater pollution has increased. Techniques like chemical coagulation, adsorption have been applied to remove the pollution, and however there are still some limitations especially that of high operation costs. The main objective of the waste water treatment is to remove the contaminants so that the treated water can be let safely into the environment. This paper provides an overview of the special issue on wastewater treatment and Reuse: Past, Present and Future. This also include advanced waste water treatment and monitoring technologies, such as membrane bioreactors, electrochemical system and disinfection technologies. This paper also articles the best management practices of biosolids, the influence of organic matter on pathogen inactivation and nutrient removal. Collectively, the special issue presents an evolution of technologies, from conventional through advanced, for reliable and sustainable wastewater treatment and reuse.

Keywords*: Bioelecrochemical system; Bioenergy; Carbon cycling; Management of Biosolids and manure; membrane bioreactors; Pathogen inactivation and nutrient removal; Specific energy consumption.*

WWT009

SYNTHESIS OF GRAPHENE RESEMBLANT CARBON STRUCTURE FROM BIO-WASTE AND ITS APPLICATION

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Abstract

Over the years with continuous development of society, energy depletion and environmental pollution has gotten worse. It has no doubt that increasing demands for clean energy. The bio-waste management has always been a big challenge in smart cities. Hence, bio-waste can be subjected to conversion into carbonaceous materials to achieve economically-worthwhile products for its emergent applications. Bio-waste from ETPs of food, agro, and diary industries, can been utilized for the eco-friendly sources for graphene like carbon synthesis. Bio-waste from this industry consists of considerable quantity of carbohydrates, fibre, and proteins. Graphene is a two-dimensional (2D) monolayer of carbon atoms with packed honeycomb lattices, displays abundant fascinating properties, such as large surface area, good thermal and chemical stability, high conductivity, and mechanical flexibility. This review focuses on the discussing the different methodology for synthesis of graphene resemblant carbon structure and their application. This graphene like carbon structure have been used filler in graphene-based composite as it has similar properties of graphene, and would only have a marginal effect in the performance of the product/application.

***Keywords**: Bio-waste management, (2D) monolayer, Graphene resemblant, Marginal effect*

WWT010

EFFECTIVE UTILIZATION OF WASTE MATERIALS FOR SOIL STABILIZATION

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Abstract

Construction of structures over problematic soils possesses difficulties like foundation cracks, sinking of foundation and upheaval due to moisture. Problematic soils possess weak stability and it will result in weak foundation support. Finally its affect the foundation stability and its life span. In this study, bagasse ash and plantain fibre were used as stabilizer. Bagasse ash can used as economical soil stabilizer and can resolve the waste management problem in large scale. The replacement of plantain fibre in expansive soil is sustainable waste management. Bagasse ash and plantain fibre have been added as binder and reinforcement respectively. To evaluate the performance of problematic soil with stabilizer, the addition of 1%, 1.5%, 2%, 2.5%, and 3% of dry soil by weight, the unconfined compression tests were carried out. Index properties were determined for soil and stabilizers. This study focus on the geotechnical improvement of problematic soils using bagasse ash and plantain fibre shows significant changes in the compressive strength of the expansive soil.

Keywords*: Problematic Soil, Bagasse Ash, Plantain Fibre*

WWT013

STUDIES ON ASYMMETRIC MEMBRANE FOR TREATMENT OF TANNERY INDUSTRIES

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Abstract

The objective is to achieve high-performance membranes with respect to flux and rejection characteristics, with an interplay of blending polymers having desired qualities. Thus, cellulose diacetate and polyethersulfone as candidate materials, in the presence of poly- ethylene glycol 600 as a pore forming agent, were blended in 100/0, 95/5, 90/10, 85/15, 80,20 and 75/ 25% compositions using N, N0 - dimethylformamide as solvent and membranes were prepared by the phase inversion technique. Polymer blend composition, additive concentration, and casting and gelation conditions were standardized for the preparation of asymmetric membranes with various pore statistics and morphology. These blend membranes were characterized for compaction in ultrafiltration experiments at 414 kPa pressure in order to attain steady state flux and is reached within 4 – 5 hr. The pure water flux was measured at 345 kPa pressure and is determined largely by the composition of polyethersulfone and additive concentration. The flux was found to reach the highest values of 66.5 and 275 l/(cm2 hr) at 0 and 10 wt% additive concentrations respectively, at 25% SPS content of the blend. Water content is estimated by simple drying and weighing procedures and found proportional to pure water flux for all the membranes. The molecular weight cut-offs (MWCOs) of different membranes were determined with proteins of different molecular weights and found to vary from 20 – 69 kDa (globular proteins) depending on the PEG and SPS content in the casting dope. Skin surface porosity of the membranes were analyzed by scanning the frozen membrane samples using scanning electron microscopy (SEM) at different magnifications.

Keywords: *blends; polyethersulfone; membranes; phase behavior; ultrafiltration*

WWT014

STUDY ON ADVANTAGES OF MOVING BED BIOFILM REACTOR FOR SECONDARY TREATMENT OF TANNERY EFFLUENT

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Abstract

The advanced biological reactor for waste water treatment, Moving Bed Biofilm Reactor (MBBR) is discussed. Microbes (bacteria/fungi) are the most important eco- friendly agents for the degradation and detoxification of industrial pollutants along with organic waste removal. In this research a comparison has been made to compute the efficiency of biological treatment using ASP and MBBR technique. Extensive research has been carried out to find suitable, optimal and efficient combination of carbon and nitrogen sources for bacterial growth. The effect of various pH values on the bacterial growth was studied and optimized. In the concerned study, an attempt is made to minimize sludge formation along with increased bacterial population using biofilm technology. Finally efficiency of treatment for ASP and MBBR was analyzed. The COD removal efficiency of ASP is enhanced up to 85% by MBBR in the research.

Keywords*: MBBR, Degradation, Biofilm Technology*

WWT015

HYBRID PROCESSES FOR THE RECOVERY OF SODIUM CHLORIDE FROM EVAPORATOR REJECT GENERATED FROM TEXTILE EFFLUENT TREATMENT PLANT

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Abstract

The reverse osmosis is one of the key techniques which have been effectively used in the textile effluent treatment plants for the recovery of water from secondary biologically treated wastewater. The membrane reject stream is evaporated in multiple effect evaporator or solar evaporation pan and dried in thin film dryer. The evaporator reject (ER) stream from reverse osmosis lacks reusable characteristics due to high contamination of inorganic salts and change in color. All such separated salt is simply stored within the premises which consume large valuable space about an acre. Almost all the Combined Effluent Treatment Plant (CETP's) are saddled with mountains of salt cake found to have more than 90% of sodium chloride are difficult to dispose. In our study, we made an effort to recover sodium chloride from the saturated solution of ER collected from Perundurai Common Effluent Treatment Plant (PCETP) by incorporating hybrid processes such as Ozonation and Selective precipitation. Ozonation process is employed to reduce the Color of ER reject solution. In selective precipitation the separation is made by the common ion effect in the presence of other inorganic and organic contaminants, using hydrogen chloride gas. The process parameters for the recovery of sodium chloride through hybrid processes such as color removal, energy consumption, time, pH, temperature and concentration of ER solution were studied and optimized.

Keywords*: Selective precipitation, Sodium chloride recycle, Evaporator reject, Textile waste water, Solid waste.*

13. Process Modeling & Simulation

PMS002

STUDY ON THE PARAMETERS INFLUENCING THE COMPUTATION OF CARBONATION EFFECT IN CONCRETE

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Abstract

This work desires to impart awareness about the carbonation effect in concrete. Carbonation favors the deterioration of steel due to the action between carbon dioxide and calcium hydroxide in cement paste. The work aids in finding the highly carbonated concrete by reviewing the correlation between the distinct types of concrete and enhancing the life of the concrete. The types of concrete under study are Fly ash and Silica fume concrete. Besides, the factors influencing the carbonation are noticed. The furnished details are a part of many research works waiting to prevent the existing old and new structures from failure due to corrosion by carbonation.

Keywords: *carbonation, types of concrete, durability, factors influencing*

PMS003

STUDY ON THE PARAMETERS INFLUENCING THE COMPUTATION OF CARBONATION EFFECT IN CONCRETE

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Abstract

Acetone-methanol mixture is a typical minimum-boiling azeotropic system which cannot be separated in its constituent liquids using conventional techniques. At the same time, pressure swing distillation (PSD) is a separation technique which does not put the requirement of an additional third component to drive the separation process. The current work is based on the application of PSD for the minimum boiling azeotropes. The current study presents a theoretical investigation done over pressure sensitivity for the PSD of acetone-methanol mixture. Various thermodynamic models have been used. The azeotrope composition shift showed a direct effect on reboiler duty. This study also presented the optimum best operating pressure which targeted total energy consumption. DWSIM, the open source simulation software, has been used for all the simulations and it matched well with the results obtained using commercial software PRO II. The present study presents the relation between high pressure column pressure and heat duty. It also discusses the possibility of heat integration and capital cost to decide the range of operating pressure.

Keywords : *DWSIM, Pressure Swing Distillation, Heat Duty, Minimum boiling azeotrope.*

PMS004

3-3-1 Machining fixture scheme optimization using Genetic Algorithm and FEM

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Abstract

Machining fixtures are used to locate and arrest the work piece from the deformation during machining operation. Fixture layout is the process of engaging the fixture elements in suitable position. In this work, work piece - fixture contact regions are considered as point contact and surface contact region. Primarily 3-2-1 locating scheme has been considered and then number of locating elements is to be changed for obtain the suitable fixture layout. Genetic algorithm based optimization procedure is followed for optimizing the fixture layout. Moment equations are developed to predict the moment induced on work piece with different layouts. Finally work piece elastic deformation values with different fixture contact regions are compared and better layout is suggested. Finite Element analysis is used for analysis of work piece elastic deformation.

Keywords: *Machining fixture, Fixture layout, Deformation, Genetic Algorithm, Surface Contact*

14. Others advances in science, engineering, and technology

OAS001

TECHNOLOGY AND MANAGERIAL RETENTION FACTORS INFLUENCING WORKERS TO SUSTAIN IN PLASTIC MANUFACTURING INDUSTRIES

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Abstract

Retention is the process of physically keeping employee members in an organization. In many cases, even engaged employees are sometimes dissatisfied with the outcomes of organizational performance which may lead them to look elsewhere. The main focus of the study is to measure the technological and managerial factors of employee retention in plastic manufacturing industries. This study determines the individual factors leading employees to leave the organization and also analyses the necessary conditions to retain the employees. The primary data which is collected from the employees of the organization in the form of Questionnaire. The secondary data were collected through company profile, organization website and other related library books. Thus, the study is based on the primary data which is collected from the company and other literature review papers. The data was collected with the help of well-structured questionnaire from 200 employees working in an organization. This study has recognized that some of the factors do affect employee retention. These factors have a substantial role to play in making employee stay i.e. Technology, Automation, Reward system, health and safety, job satisfaction and workspace environment. Thus employee retention will help to increase overall productivity.

Keywords*:Employee Retention, Automation, Retention Strategies, Technology, Productivity*

OAS003

A BIOMETRIC BASED MEDICAL INFORMATION SYSTEM FOR THE IDENTIFICATION OF COMORBIDITY IN COVID-19 PATIENTS

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Abstract

Medical information System provides the best way to collect patient's medical information. It helps the doctors to retrieve the patient's previous medical history very faster and able to provide suitable treatment quickly. To keep medical information of a patient securely is a difficult task. Many MQTT algorithms have been developed to provide security for the patient's information. The sensitive medical information of a patient can also be protected by using biometric technology. Internet of Thing (IoT) technology used to send the medical information to the doctor like blood group, BP value, cholesterol level and heart rate level. The proposed system helps to provide the comorbidity details of the Covid-19 infected patient's to doctors mobile phone. It also takes the current health details of the patients like temperature, respiratory rate and heart beat rate. By considering the past and present medical data of the Covid-19 patients, this system recommends the type of treatment to be given for Covid-19 infected patients.

***Keywords**: Covid -19, Medical Information, Biometric, IoT, Sensors*

OAS004

SMART EXAM MONITORING SYSTEM

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Abstract

Owing to pandemic, most of the institutions are in a situation to use virtual mode of education. Institutions are unable to monitor student's activity precisely through online, especially when it comes to exam. The quality of education is spoiled because of unfair practices by the students during examinations. The invigilator should have complete coverage of the students to conduct exams in a sincere manner. Our project aims to create a Web app for video conferencing that enable invigilators in accessing the position of the mobile. An IoT and microcontroller based system is employed for developing the hardware set-up. A specially designed holding device has been developed to change the position of mobile phone for viewing different angles of the candidate appearing for exam. The examiner can monitor the student by adjusting the students' camera from the examiner location itself. The proposed system will be helpful for educational institutions to conduct examinations in an effective manner.

Keywords: *Web App, IoT, Microcontroller***.**

OAS005

IDENTIFICATION OF BURIED HUMAN BODIESUNDERLANDSLIDES USING GPRINTEGRATED WITH WI-FI

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Abstract

This paper proposes about disasters like landslides, collapsed building, and earthquake. For the detection of human bodies a new technique arises that uses GPR (Ground Penetrating Radar) along with microcontroller. GPR is a non-destructive and geophysical method which uses pulses of radar to image the subsurface. The GPR normally uses radio waves of high frequency in the range of 10MHZ to 2.6GHZ. This technique assists rescuers to a greater degree at disaster sites. The transmitter of the GPR and antenna emits electromagnetic radiation into the earth. Electromagnetic radiation in the microwave band of the radio spectrum is used to collect the reflected signals from the subsurface. This technique also uses PIR and ultrasonic sensors to detect human motion in all directions. The data can be obtained through the wi-fi module and the results displayed on the smart phone screen by using the testing app. For the highest signal power, ground penetrating radar is in contact with the ground. It will be mirrored or refracted to the surface as energy reaches a buried material. To record the variations in the return signal a receiving antenna will be placed.

Keywords: *Rescue Robot , GPR , GPS , Wi-Fi module , isearching app.*

OAS006

DESIGN AND DEVELOPMENT OF DIGITAL E-LIBRARY

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Abstract

Digital libraries are platforms that allow users to access structured information in a knowledge-based repository of data and access. In the end, the availability of good content and easy accessibility and use will drive the production and growth of digital libraries. Significant advancements in IT and the rapid development of online data have generated an intense interest in tools to help users find desired data. This paper describes how, particularly in college libraries, a digital library can be built and enforced in an academic library. The specifications for hardware, software, processing and recovery technologies are addressed. An elegant user interface, combined with better browsing, insertion and reporting capabilities, functionality that anyone can access from anywhere. The library's automatic update facility helps to get a clear idea of which books are accessed by the members, allows users to create a 'hard copy' report. The Digital library system stores information such as name, address, ID number, date of birth of library members. The information of books such as book name, book number, topic to which it refers, author, edition, edition, year of publication, total number of publications, total number of books in the library can also be stored and accessed digitally.

Keywords: *Digital Library, Easy access, improving performance, elegant interface.*

OAS009

A CUTTING-EDGE APPROACH TO GENERATE RANDOM BIT SEQUENCE WITH CONFOUND CHAOTIC MAPS

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Abstract

A random number sequence is a sequence of numbers that exhibit statistical randomness. In other words, all numbers in the sequence have an equal chance and its hard to predict the next number in the sequence. They are most commonly used in cryptography to strengthen the security. Same key can be used by sender and receiver to generate the same set of random numbers. The pseudo-random number generation is an important task in computer science with various security features. There are 2 types of random number generators; they are True Random Number Generators (TRNG) and Pseudo Random Number Generators (PRNG). In recent years, PRNGs are implemented in hardware or software using chaotic maps. Some of the chaotic maps used in PRNG are Logistic map, Lorenz map, Henon map, Skew Tent map, Saw tooth map, etc. The Tinker Bell map is a discrete-time chaotic dynamical system with four system parameters. It is a most commonly studied examples of dynamical systems that exhibit chaotic behaviour. Chaotic maps possess several drawbacks such as the discontinuity of ranges, non-uniform distribution, periodicity in chaotic range, and small key space. In this PRNG, the numbers are generates in an unpredictable manner. To improve the uniform distribution and periodicity in random number generation, combination of Logistic and Tinker bell map is proposed. The Logistic map is a polynomial mapping .The Tinker bell map is known to have shorter periods. It is notable for having chaotic solutions for certain parameter values and initial conditions. In the proposed work, the Tinker bell map perturbs Logistic map to increase the chaotic behaviour of Logistic map. Output of the Logistic map is taken as Pseudo random bit sequence or Pseudo random number. NIST statistical test suite is used to verify the randomness of the generated random sequence.

Keywords: *Logic map, Tinker Bell map, Chaotic PRNG, Random Bit Sequence*

OAS010

MODIFIED LINEAR CONGRUENTIAL GENERATOR TO SECURE RANDOM NUMBER GENERATION

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Abstract

Random numbers are important tools for generating secret keys, encrypting messages, or masking the content of certain protocols with a random sequence that can be deterministically generated. The lack of assurance about the random numbers generated can cause serious damage to cryptographic protocols, prompting vulnerabilities to be exploited by the attackers. In this paper, a new pseudo - random number generator algorithm that uses dynamic system clock converted to Epoch Timestamp as PRNG seed was developed. The algorithm uses a Linear Congruential Generator (LCG) algorithm that produces a sequence of pseudo - randomized numbers that performs mathematical operations to transform numbers that appears to be unrelated to the Seed. Simulation result shows that the new PRNG algorithm does not generate repeated random numbers based on the frequency of iteration, a good indicator that the key for random numbers is secured. Numerical analysis using NIST Test Suite results concerning to random sequences generated random numbers has a total average of 0.342 P-value. For a p-value $\geq$ 0.001, a sequence would be considered to be random with a confidence of 99.9%. This shows that robustness and unpredictability were achieved. Hence, It is highly deterministic in nature and has a good quality of Pseudo-Random Numbers. It is therefore a good source of a session key generation for encryption, reciprocal in the authentication schemes and other cryptographic algorithm parameters that improve and secure data from any type of security attack.

Keywords: *Linear Congruential Generator, Epoch Timestamp, Mobile Accelerometer, Random Bit Sequence*

OAS012

A STUDY ON INFLUENCING FACTORS TOWARDS ONLINE FOOD DELIVERY SERVICES

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Abstract

E-Commerce is bringing changes to the traditional way of doing business. One such market which is gaining popularity is the online food delivery services. Food supply is one such supply services where the online system controlling the supply chain has to be dealt with different approach because food is perishable product. Subsequently there is a need to deliver food on-time to the customers. There are various organizations working on the food supply chain, delivering food door-to-door based on orders placed online are the Just Eat, Grub hub, Uber Eats, Swiggy, Zomato, Food-Panda, Domino's .This paper aims to investigate the different basic services identified with food delivery system and investigating the chance of coordinating extra services that improve the food delivery services to guarantee on-time food supply. The fundamental linkage in the entire food supply chain is the delivery system where the delivery agents play a key role. Data was collected randomly through a survey to get an overall view of the food service delivery system. The relationship between the various factors that affect the food delivery process has been analyzed. The objective of the study is about to determine the factors affect online food delivery, relationship between customer and the delivery agent and factors responsible for on-time delivery of food. The methodology used here is, random sampling method and the primary data is about questionnaire and data was collected from 120 members in erode. From the result, approximately having 50-75% of good relation with customers overall in all aspects.

Keywords*: Online Food delivery, E-Commerce, Consumer Behaviour, Analysis Factors, Food Supply chain, Relationship with delivery person*

OAS015

OBJECT AND LANE DETECTION FOR AUTONOMOUS VEHICLE USING YOLO V3 ALGORITHM

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Abstract

The detection of objects around an autonomous vehicle is essential to operate safely. In many autonomous driving systems, the object detection task is one of the most important prerequisites to autonomous navigation. In this work, an approach to deep object detection is examined. Object detection, a subset of computer vision, is an automated method for locating interesting objects in an image with respect to the background. Solving the object detection problem means placing a tight bounding box around these objects and associating the correct object category with each bounding box. Like other computer vision tasks, deep learning is the state-of-art method to perform object detection. In the existing system it detects the objects like vehicles, persons, traffic lights separately and detects lane detection separately. The problem identified here is in the existing system the camera is fixed in a particular place it detects lanes only if the objects come into camera frames and detects object. It is not detecting both objects and lanes simultaneously when the autonomous vehicle is in motion at any location. In the proposed system to overcome these problems both object and lane are detected by a camera mounted in the front of the moving vehicle. It is based on object and lane detection which includes the objects, vehicles, persons, traffic lights and localization of the road, the determination of the relative position between vehicle and road, detect the objects in front of the vehicles and the analysis of the vehicles heading direction. Thus the problem of object and lane detection is simultaneously addressed in this work and makes the detection faster than the existing system

Keywords: *Deep Learning, Object Detection, Lane Detection, Autonomous Vehicle*

OAS016

PREDICTING THE PRICE RANGE OF MOBILE PHONES USING MACHINE LEARNING TECHNIQUES

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Abstract

During the purchase of mobile phones, various factors like the memory, display, battery, camera, etc., are considered. People fail to make correct decisions, due to the non-availability of necessary resources to cross-validate the price. To address this issue, a machine learning model is developed using the data related to the key features of the mobile phone in this work. The developed model is then used to predict the price range of the new mobile phone. Three machine learning algorithms namely Support Vector Machine (SVM), Random Forest Classifier, Logistic Regression are used to train the model and predict the output as low, medium, high or very high. The dataset used in this study is taken from the Kaggle platform. In order to improve the classification accuracy, Chi-Squared based feature selection method is used. Among 21 features available in the dataset, only top 10 features namely RAM, pixel height, battery power, pixel width, mobile weight, internal memory, screen width, talk time, front camera, and screen height are selected and used to train the model. Before feature selection, the accuracy obtained using SVM, Random Forest Classifier and Logistic Regression is 95%, 83%, 76% respectively. After applying feature selection, the accuracy obtained using SVM, Random Forest Classifier and Logistic Regression is 97%, 87%, 81% respectively. From the experiments conducted, it is found that the SVM gave higher accuracy when compared to other two classifiers.

Keywords: *Machine Learning***.** *Support Vector Machine, Random Forest Classifier, Logistic Regression, Classification Accuracy*

OAS019

COVID-19 PANDEMIC: SHARE PRICE VOLATILITY BEHAVIOUR OF SELECTED FOOD PROCESSING COMPANIES IN NSE

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Abstract

The outbreak of COVID -19 has affected the entire Indian financial market in an unprecedented way. Estimations of volatility helps to measure the performance of the share price of the company. Given the Covid situation, this paper empirically investigates the impact of COVID-19 on the selected companies listed in NSE involved in the food processing. The objective of the paper is to examine the level of volatility prevailing in the selected food processing companies share returns. The daily returns of the companies are collected from January 1, 2019 to November 27, 2020. Further, the study has attempted to make comparative analysis of the returns for Pre-Covid and during the Covid period. GARCH model is used to capture the volatility of the returns. Findings reveal that the high volatility is experienced during the Covid period observations. While comparing the returns of the stock, the returns are positive during the Covid period than the Pre-Covid period. Thus reflecting the bounce back from the unprecedented Covid shocks in the market.

Keywords: COVID 19, Volatility, Returns, NSE, GARCH (1,1)

OAS021

REMOTELY PILOTED AERIAL SYSTEM IN FIRE FIGHTING

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Abstract

Fire is one of the indispensable troubles that have not yet been addressed despite the technological growth.The most significant factor linked to fires is a human loss. It would be beneficial to reduce its effectiveness as it might be difficult to prevent the fire from happening. The reality that unmanned aerial vehicles (UAVs) are capable of performing that hazardous and dangerous tasks and their ability of rapid and efficient working, allows them to be used in fire-related problems like coming into and exploring fire places.The UAV is proposed to be built so that an extinguishing mechanism will be carried while flying. Building an aerial firefighting system is the objective in this project that carries out the duty of extinguishing fire controlled by a pilot that operates the drone distant from the danger zone. In this way, the efficiency is increased, since they have exact control of where to prioritize the rescue operation.

Keywords: *Drone, Fire extinguishing mechanism, Firefighters, Extinguishing ball, Flight controller, RF controller.*

OAS023

ENHANCING THE CONFIDENTIALITY OF TEXT EMBEDDING USING IMAGE STEGANOGRAPHY IN SPATIAL DOMAIN

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Abstract

Rapid growth in technological development, the use of the internet has grown many folds. Along with it, the sharing of privacy information in networks creates ownership issues. In order to create a high level of security for sharing private information, the concept of steganography is introduced along with encryption based invisible watermarking techniques. The proposed system hides the encrypted private messages by using onetime pad which follows the concept LSB algorithm in spatial domain. The system combines steganography and encryption for enhancing the confidentiality of the intended messages. At first, the private information of the user is encrypted by using the onetime pad algorithm. Then the encrypted text is hidden the Least Significant Bit (LSB) of the different components of the color image in such a way that as to minimize the perceived loss of quality of the cover image. The beneficiary of the message is able to retrieve the hidden back and from the stego-image and extract the cipher text and find the plaintext from using the onetime pad algorithm. The proposed algorithm will be tested and analyzed against three different hiding positions of color image components.

Keywords: *least significant bit (LSB), one time pad (OTP), stego-image, different color components.*

OAS024

INVESTIGATION OF APPLYING VARIOUS FILTERS FOR TRAFFIC SIGN BOARD DETECTION USING CONVOLUTION NEURAL NETWORK

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Abstract

Autonomous cars must take real-time decisions about surroundings to reduce death rates during traffic accidents. Traffic related information's are available in the Traffic sign. It assists to drive better and safer, In the traditional method, the traffic sign is detected by manually or computer vision methods. Those are time consuming processes. So, Self-driving cars must need traffic sign recognition automatically, in order to properly recognize and understand the roadway. No-one will be aware of all traffic signs, so it will let everyone know and learn the signs easily. Traffic sign recognition is just one of the problems that computer vision and deep learning can solve Convolution Neural Network (CNN) architecture. Machines are able to identify traffic signs from the German Traffic Signal Recognition Benchmark (GTSRB) dataset that contains forty three classes. The proposed system has three working stages: image pre-processing, detection, and recognition. Initially, the traffic sign image is pre-processed, and the detailed information present in the traffic sign image is detected by using the histogram equalization method, which improves the contrast of the traffic sign image. After preprocessing, the features of the images are extracted by using CNN architecture with three non-linear activation functions such as Re-Lu, LeakyRe-Lu and sigmoid. The experimental results compare the results of the above three non linear activation functions. The activation function Re-Lu and Leaky Re-Lu achieved accuracy above 95%. After feature extraction, the output layer is used to predict the traffic sign images.

Keywords: *Traffic sign, Activation filters, Convolution Neural Network, Re-lu, Leaky Re-Lu and Sigmoid*

OAS026

PHYSICAL POSITION BASED SHORTCUT TREE ROUTING IN ZIGBEE WSN'S

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Abstract

ZigBee is a worldwide standard wireless personal area network that focuses on reducing power conception and it is also cost efficient, reliable and also contains scalable products and applications. In data communication networks, most significant functions is routing between nodes. ZigBee standard helps a combination of tree routing and vector routing on demand. Shortcut Tree Routing (STR) extensively improves the path effectiveness of ZigBee tree routing by including only the neighbor details of a hop. Also, the routing path is not always optimal in one feature of end-to-end hop distance is STR limitation. It is clearly that preserving two-hop neighbor information generates large protocol overhead on network through large node density. So, this work proposes an enhancement of the STR along with the information on physical position of nodes. That is, STR is used to find the next hop and from which the physical distance among node and destination is used as one of the parameters to get the good route.

Keywords: *ZigBee, Tree routing, On-demand routing, Wireless sensor network, Shortcut tree routing*

OAS027

ENRICHMENT OF AFFILIATE MARKETING USING K-MEANS CLUSTERING ALGORITHM FOR EARLY STAGE AFFILIATES

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Abstract

At present, most people like to buy things online (i.e.) through e-commerce websites. People consider the advantages in online shopping like reduction in travel cost, time-consumption and offers, etc. Even though these advantages paves the way for e-commerce growth, it is not sufficient. The constant parameter that supports the growth of an e-commerce company is marketing. Marketing plays a major role in a product or idea promotion in both offline and online business. Suppose if the availability of the product belongs to a particular region, then direct marketing is more efficient for the product to meet its success. But shopping websites like Amazon, Flip kart, Snap deal etc., cannot implement direct marketing because those companies' boundaries are not limited to a particular region. In this case, affiliate marketing comes into the role which acts as an intermediate between the consumer and e-commerce companies. Affiliate marketing is one in which a person uses their marketing strategy to promote the e-commerce products in social network by becoming an affiliate to that company. Affiliates will be allocated with a unique referral link. If a person buys a product using that reference link then a commission will be paid to those affiliates by the respective company. In this paper, the K-Means Clustering algorithm is going to be implemented on a dataset with the help of a Pyspark environment that helps the affiliates for their marketing to reach the right customer with the right product.

Keywords: *Affiliate Marketing, Pyspark, K – Means Clustering, Silhouette.*

OAS028

DEFENSIVE ALERTING SYSTEM AGAINST RECKLESS DRIVING IN VEHICULAR NETWORKS

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Abstract

Reckless driving seriously undermines the wellbeing of guiltless individuals, which represents around 33% of all fatalities in significant vehicle mishaps. Be that as it may, most existing endeavors center on the recognition and change of a vehicle's own driving conduct, whose adequacy is extremely restricted. Even though many of the Public Key Infrastructure (PKI) centered vehicle authentication frameworks are proposed, the requirement of further communication in order to manage the certifications of vehicle and the heavy communication and computation overheads caused by the Certificate Revocation List(CRL) makes the system non feasible. In this paper, we tend to propose reckless vehicle authentication and to generate the pseudonym we initiate the PKC - Public Key Cryptography, which guarantees a legalized mediator to attain non-denial of all the vehicles by acquiring their unique identities(IDs). We tend to propose a Public Key Cryptography-centered malleable pseudonym plan by introducing auto-created pseudonyms rather than vehicle's identity in authentication taking into account on preserving the privacy and non-repudiation, where depending on the vehicular demands the pseudonym update can be done. In the reckless vehicle authentication, we propose to utilize the Identity Based Signature - IBS scheme for the Vehicle to Road Side Unit - V2R certification and the Road Side Unit to Vehicle - R2V certification, which is communication efficient. The Identity Based Online/Offline Signature - IBOOS scheme is pre-owned in the Vehicle to Vehicle - V2V certification with the aim of reducing the communication aerial caused by the Identity Based Signature – IBS scheme.

Keywords: Reckless driving, Road Side Unit(RSU), Public Key Cryptography(PKC), Identity Based Signature(IBS)

OAS029

SIGN TO SPEECH TRANSLATOR FOR DEAF PEOPLE

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Abstract

The inability to talk is taken into account to be a true disability. The motive of the paper is to convert the human signing into Voice with human gesture understanding and motion capture technology. The signing is especially used for the communication of deaf-dumb people. In this paper, we propose an intelligent system for translating sign language into a voice signal. This system consists of hardware and software. The hardware is formed by a flex sensor, an accelerometer, an Arduino board, and a Bluetooth technology respectively, mounted on a Polyester-Nylon glove. The software includes an Android studio to create apps. This paper also deals with the current work done by the researchers in this particular area such as translating eyeglass, camera conveying signal, portable telecommunication for dumb and deaf people and it states the different methodologies or approaches for gesture recognition, it also contains vision-based approaches, glove based approaches, and a smart phone app-based approach respectively. The hand gesture activities done by the user is detected by the sensors. it transmits the data to an Arduino board where the transmitted data matches with the database, and sends the matched data via Bluetooth to an android app, it converts the data into audio for further consideration. If a person cannot speak, He can stand and perform the actions thereby enabling the system to convert the human gestures into speech and play it aloud, so that the person can easily communicate with a mass crowd gathering. The proposed system helps in bringing high efficiency for the users and improved communication.

Keywords : *current works , methodology , working ,signing language , flex sensor, Arduino*

OAS030

IMPACT OF FOOD PROCESSING INDUSTRY ON ECONOMIC GROWT, FDI AND EXPORTS IN INDIA

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Abstract

Foreign Direct Investment (FDI) is an investment made by an foreign resident of an country to take the advantage of local befits such as lost cost labors, subsidies, etc.,. Developing countries like India need more FDIs to boost the economic activities of a country. Food Processing Industries has a special bench mark in FDI in India because it has a significant role nation's economic growth. Food Processing Industry connects Indian villagers who are the back bone of India and national and international investors in the market. Thus Food Processing Industry is emerged as a sunrise sector for FDI in India. This research study has been divided into three folds. First, analyze the share of Food Processing Industry in FDI in India, second analyze the contribution of Food Processing Industry in GVA (proxy for Economic Growth) in India and the third analyze relationship between Food Processing Industry and exports.

Keywords: *Food Processing Industry, Foreign Direct Investment, Economic Growth and Exports.*

OAS031

SNAKE ROBOT FOR MONITORING DAMAGE OR OBSTACLES BY ANDROID APPLICATION

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Abstract

In this present day society snakes detectable characteristics into robots is becoming more dominant factor for creating a latest kind of locomotive and expanding the function of the robots. In this project, a 6-link snakelike robot, which is progressing through the dissimilarity among normal and tangential friction by using 6 servo motors is designed. The driving force of the robot is created by oscillating its joints from side to side. The proposed robot model contains of six building blocks that are attached by revolute joints. Pilot results of snake robot show that the gait based on serpentine curve is sensible and supervised easily. In a short-distance environment, the proposed method is performing autonomous navigation and positioning the obstacles very easily. In the proposed project, the designed snake robot is used to monitor the narrow space openings where humans and four wheel robot cannot able to inspect. Here Arudino microcontroller is used for controlling the snake robot.

Keywords : *Snake, Robot Monitor, Damage, Obstacles, Controller*

OAS032

ENTREPRENEURIAL MOTIVATION IN THE ESTABLISHMENT OF FOOD PROCESSING STARTUPS IN ERODE DISTRICT, TAMIL NADU

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Abstract

Entrepreneurial motivation plays a key role in the establishment of Food Processing start-ups in India. The main purpose of this research is to determine the Entrepreneurial Motivation in the Establishment of Food Processing start-ups and to examine the underlying motivation on success factors in start-ups. This study is a descriptive study and a cross sectional study. The target population of the study is entrepreneurs who were involved in the food processing start-ups in Erode district, Tamil Nadu. This study was conducted from August 2019 to December 2019. The researchers used questionnaire method for collecting data from the entrepreneurs who were into the business of food processing start-ups in order to identify the Entrepreneurial motivation. Since the sampling frame work was not available, the researchers used snow ball sampling method for data collection. This study identified that the need for achievement, need for power, and demand for the product, support of the Government, risk tolerance and self-efficacy were the underlying motivation. This study also found that need for achievement, need for power, demand for the product, self-efficacy, risk tolerance significantly influence the success of the start-ups. Even though this study has achieved its objectives, the study findings cannot be generalized. However the findings might facilitate the Government in general, Policy makers in particular to formulate the startup policies in Food processing Industry.

Keywords: *Self-efficacy, Risk Tolerance, Need for Power, Government Support, Demand for the Products.*

OAS033

BAN OR BOON: CONSUMER ATTITUDE TOWARDS PLASTIC BAGS BAN

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Abstract

In Tamil Nadu, the state government has imposed a ban on plastic bags two years ago. This has created a major impact of the day to day life of common people. Though it has positive effect on the environment, the common public had different perception as a consumer. This paper aimed at studying the consumer attitude towards the ban on plastic bags. A descriptive research design adopted to address the various dimension of consumer perception towards the ban on plastic ban. A sample size of 400 respondents was selected on the basis of systematic random sampling technique to collect data through structured questionnaire. For conducting the survey, consumers of retail shops in urban and rural places were chosen as target respondents. The collected data were analyzed with the help of statistical tools such as ANOVA, t-Test, Correlation, Linear Regression and Structural equation modelling and the interpretation reported. The result revealed that only 34 percentage of respondent were aware the environmental impact of plastic bags. About 71 percentage of consumers reported that they have faced difficulties in their day to day life due to plastic ban.

Keywords*: Plastic, Environment, Consumer attitude, purchase behavior, Structural equation modelling.*

OAS034

THREE PHASE INDUCTION MOTOR POSITION CONTROL USING V20 DRIVE

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Abstract

The present scenario in the electrical department is to improve energy proficiency and to investigate innovative compelling and increasingly smart approaches to use power consumption in industrial applications. Electrical machines are a basic requirement for operating various functions in the industry like a crane, blower, material handling systems, pharmaceutical industries and cement industries, etc. The three-phase Induction Motors (IM) is the prime wellspring of vitality employment in industrial applications. The utilization of the Variable Frequency Drives for the industrial application from a small range of induction motor into large capacity of induction motor ranges to improving the effectiveness and efficiency of the process output. The speed and position control is a combined module of the Variable frequency drive section and a Programmable Logic Controller (PLC). So joining the VFD drive with the PLC controller brings out the effective outcome of controller efficiency. The V20 drive having a module of single-phase to three-phase inverter circuit connecting with induction motor to approach of innovation and accessibility of movement control of electric motor with conveyor model, the use of Programmable Logic Controllers with power hardware in electrical machines developed and tested in the assembling hardware setup. In this hardware setup PLC with a VFD system for changing the position and speed more accurately of the drive system with load arrangements. The speed changing is proportionally generated by the PLC controller output signal. The speed control and position control of PLC based V20 drive module developed and tested successfully.

Keywords: *V20 drive, Three phase Induction motor, Inverter, Speed, Controller.*

OAS035

HONEY HIVE MONITORING USING IOT

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Abstract

Bees are essential to our food supply. Bees are helpful for ecosystems and the sustenance of the many crops, because of their capability to cross-pollinate flowers within the field. Their populations are decreasing because of the Colony Collapse Disorder (CCD) within the honey bee. If a hive experiences Colony Collapse Disorder (CCD) most of the worker bees in the honey hive disappear, leaving behind a queen, plenty of foods, and a few nursing bees to take care of the remaining immature bees. It is imperative to understand the hive's health and activities of a bee for beekeepers and to take care of the bees and it is necessary to get all sorts of data on the ecological situations including nearby of the beehives. It is necessary to gather data from the honey hive without disturbing to avoid changes within the honey bees' work situations and to get the data. This system monitors physical variables from the beehive, including Co2, temperature, humidity, and weight in a continuous manner and it is becoming feasible as the price and size of electronic sensors decrease whereas their exactness and capability increase. By collecting different sorts of data and data analyses and giving beekeepers better-informed choices for getting information on colony phenology within the field without disturbing the beehive, and for collecting information from different sorts of sensors to get a complete status of a honey bee colony

OAS037

A REVERSIBLE DATA HIDING METHOD FOR IMAGE PROTECTION

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Abstract

Encryption is the way toward encoding given information that can't be perceived by an unapproved individual. Securing a message or a picture which is partaken in a social stage is the difficult undertaking these days. This paper proposes an account procedure for Reversible Room before encryption surface union cycle into secret writing to cover secret messages. A Reversible room before encryption surface mix measured sample's a more unobtrusive surface picture, which arranges another surface picture with a similar neighborhood appearance and an optional size. In this paper Reversible Data Hiding Method is proposed to encrypt the images along with the data. Through this method PSNR value is reduced. This philosophy offers three specific focal points. First, an original image is encrypted. When the image is encrypted, the encrypted data can't be easily read. Second, the encrypted image is sent to the data hider where the additional data is added along with the encrypted image. Here the Reversible Data Hiding Method is mainly used to reduce the noise created when hiding an image. The Color Code Nominal Value is embedded. Third, encrypted image containing the embedded data is sent to the receiver where the original image is decrypted and the additional data is extracted. Exploratory results have affirmed that our proposed figuring can give various amounts of introducing limits, produce ostensibly possible surface pictures, and recover the source surface. This work introduces a simple and convenient way of offline image searches on desktop computers and provides a stepping stone to future content-based image retrieval systems built for similar purposes.

Keywords: *Information Hiding, Prediction error expansion, Reversible Data hiding, Embedding capacity, Steganography*

OAS038

DESIGN AND DEVELOPMENT OF SOLAR POWERED UNMANNED AERIAL VEHICLE (UAV) FOR SURVEYING, MAPPING AND DISASTER RELIEF

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Abstract

Unmanned Aerial Vehicle (UAV) offers various advantages in mapping and surveying in recent times. The use of solar panels in a standard UAV pushes the general aviation standards of endurance in air. This paper focuses on designing and developing a solar-powered UAV with solar endurance capabilities while simultaneously used for surveying, mapping and disaster relief. The proposed UAV is designed specifically to stay in the air as long as possible, which in turn increases the flight travel distance. Acquiring the solar power as an energy resource enables the small scale UAVs to bear a heavier, more efficient payload sensor and can extend flight times. The flight is designed in accordance with the solar endurance project and falling under the requirements needed to qualify the solar endurance. The proposed work also focuses on designing the UAV considering the payload capabilities and integrated with sensors to collect environmental parameters. Highlights in this paper are the construction and the design of the UAV aircraft by using ANSYS.

Keywords : Solar powered *UAV, MPPT, CFD, ANSYS* **.**

OAS041

AUTOMATIC FABRIC CUTTING

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Abstract

During the past few decades, automation plays a vital role in many production industries. Cutting is the first working department in garments production. Garments production involves three major operations which are cutting, sewing, and finishing. Before sewing and finishing operations, cutting process has tobe done. The main role of cutting process is to transform fabric rolls into garment panels for further sewing operations. Amongst the three main production processes, a considerable amount of fabrics would be lost during the cutting and spreading process. An improvement of 2-3% in material utilization efficiency of cutting floor can make a huge difference to bottom line profitability. So the manual method of cutting has to be replaced by the automatic cutting technology. This project aims to cut the fabric automatically. The proposed system automatically cuts the fabric cloth. The solution is in the form of an Arduino-driven device that cuts the fabric to the given length automatically. The user simply inputs the count of the fabric with the help of matrix keypad. The fabric is spread with the help of conveyor. Where in other place, a servo motor moves a razor blade over the fabric, cutting it into perfect length. This method provides a degree of accuracy and speed of cut much greater than manual cutting. It reduces the wastage of fabric and makes the business profitable.

Keywords: *Cutting, fabric, textiles, automatic***.**

OAS042

A NOVEL APPROACH FOR DRIVER DROWSINESS DETECTION USING DEEP LEARNING

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Abstract

If the driver does not have proper rest, he/she tends to fall asleep causing an accident. The main objective of the project is to design a system that can detect the driver drowsiness and alert them to reduce road accidents. The system takes the input images through a camera which focus on the driver. Initially the face is detected usingNaive Bayes Region of Interest algorithm, and then the eye and mouth regions are separated. In this paper, a single layer Artificial Neural Network is used along with the auto encoder module of the Deep Learning Toolbox to categorize them to one of the classes as 'drowsy' or 'alert' based on the eye closure detection. The proposed method offers better accuracy in driver drowsiness detection.

Keywords: *drowsiness, Naive Bayes Region of Interest, Deep Learning.*

OAS045

INVESTIGATION ON DEEP LEARNING FOR HANDWRITTEN ENGLISH CHARACTER RECOGNITION

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Abstract

Handwritten character recognition is a system widely used in the modern world and it is still an important challenge. Traditional machine-learning techniques require careful engineering and considerable domain expertise to transform raw data into a feature vector from which the classifier could classify the input pattern. To cope with this problem, the popular Deep Convolutional Neural Networks (DCNN), introduced recently, have effectively replaced the hand-crafted descriptors with network features and have been shown to provide significantly better results than traditional methods. It is one of the fastest growing areas in machine learning, promising to reshape the future of artificial intelligence. However, the problem with deep learning is that it requires large datasets for training because of the huge number of parameters needed to be tuned by a learning algorithm. CNN model can be used in three different ways: (i) training the CNN from scratch; (ii) using the transfer learning strategy to leverage features from a pre-trained model on a larger dataset; and (iii) keeping the transfer learning strategy and fine-tune the weights of CNN architecture. In this work, we investigate the applicability of DCNN using transfer learning strategies on two datasets; a new expanded version of our recently proposed database for offline isolated handwritten English character. Our results showed satisfactory recognition accuracies and outperform all other prominent exiting methods in the field of Handwritten English Character Recognition.

Keywords: *Deep Convolutional Neural Network (DCNN), Handwritten English Character Recognition (HECR), Transfer Learning***.**

OAS046

SMART HEARING AND VISUALLY IMPAIRED PASSENGER ALERT SYSTEM

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Abstract

An outcome of hearing misfortune is the loss of auditory information and this misfortune may affect behavior in transportation circumstances and can decrease transport security. The primary purposes behind the inconvenience are unpredictable train plans have made it practically difficult to appraise the hour of arrival in the necessary destination. In the current strategy, the traveler will know the destination of the train by getting the buzzer alert signal by utilizing the RF module. This paper mainly focused on the issue looked by Hearing impaired travelers who utilize public transportation. From the display board the information will be gathered and send to the voice converter which is the input for seismic generator and subsequently the data will be felt as vibration to the passenger. The fundamental target is to make the outwardly and hearing hindered individuals realize the basic data reported in the railroad station with no troubles. The advantage is not only help the hearing impaired people but also it is useful for the other traveler by knowing the information of the declaration show board which is far away from thestage.

Keywords: *auditory information, destination, RF module, seismic generator, vibration.*

OAS047

TERRAIN IDENTIFICATION AND LAND PRICE ESTIMATION USING DEEP LEARNING

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Abstract

In terms of pricing, the real estate market is one of the most dynamic and often appears to differ greatly depending on several variables. Property price forecasting is an important decision-making module for both buyers and investors in promoting budget allocation, finding property, finding strategies and deciding effective policies. The land has socio-economic and environmental values, and rising prices for land growth such as built-up, rural, residential, commercial and industrial areas are included in the problems of facing land pricing. These land prices depending on market and non-market threats, increase or decrease at varying rates over a given period of time. Using machine learning, we will estimate the cost of the land in order to eliminate the Land-pricing uncertainty. So that the consumers will have the approximate land price range at a geographic region. A solution using Convolution Neural network is used to solve the challenges. As a consequence of its high precision, CNNs are used for image identification and classification. A Convolutional Neural Network, also known as CNN or ConvNet, is a class of neural networks that specializes in processing data that has a grid-like topology, such as an image. CNN layers filters and categorize land image into various classes and estimate the price range of it. And we have also used ResNet model for the comparison purpose. ResNet, a pretrained algorithm is used for image classification which gives higher accuracy. It functions to create a network, like a funnel, which eventually creates a completely integrated layer where all the neurons are connected to each other and the output is processed.

Keywords: *ConvNet, ResNet, Land Price, Estimation, Convolutional Neural Network*

OAS049

ANDROID SECURITY: STATE OF THE ART AND CHALLENGES

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Abstract

Nowadays Android devices are rapidly increasing as per the user's needs and are very helpful to fulfil personal and professional needs. Also, these devices are quickly turning into a genuine danger because of the various malwares and security issues and threats present in them. In this paper, different proposals of security mechanisms and techniques are reviewed, which are used to ensure the security of these devices along with the latest state of art. It also discovers different kinds of security mechanisms that include authorization related issues, which are a continuous wonder in Android applications. Consent related issues that can often times wait inside an application for an all-inclusive timeframe, which can be as high as quite a while, prior to being fixed. With the collected information, security mechanisms are evaluated to find the effectiveness of methods for forestalling and identifying portable malwares and threats. Also analyzed, the motivating forces that cause benign android hobbyists to distribute root exploits and overviewed the accuracy and accessibility measures of those techniques.

Keywords: *Android, Malware, Security, Authentication*

OAS051

OPTIMIZING THE SENSOR DEPLOYMENT STRATEGY FOR LARGE-SCALE INTERNET OF THINGS (IOT) USING ARTIFICIAL BEE COLONY

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Abstract

In the large-scale Internet-of-Things (IoT) applications, especially in the environmental monitoring, recent developments in the low-power long-range communication systems such as the LoRa have opened up with new possibilities. However, maintenance has been greatly challenged by the flexible climate and long distance travel. Previous studies have shown that higher electronic failure rates are exponentially accelerated by temperature. The cost of maintenance can be as high as 80% of the overall cost of maintenance. Expenses for deployment is extremely high, if not handled carefully. In this proposed paper, a problem with the deployment of sensors to preventively mitigate maintenance costs thus maintaining tolerable efficiency of the sensing quality metrics and the complete connectivity were formulated. We propose a Maintenance Cost model considering the thermal degradation and degradation for IoT networks and battery depletion. We analyze the spatial phenomenon methodology in order to adopt sensing quality metric based on shared results. Although problem proposed is the non-convex, hence we bring up with a relaxed problem, with a sparse nonlinear optimizer form and we solve it. Further we apply two population-based meta-heuristics, i.e., Canonical Particle Swarm Optimization (CPSO) and Artificial Bee Colony (ABC) algorithm to make the solution approximate optimally. Compared to the current greedy heuristics, our meta-heuristics demonstrate good results for maintenance costs under the same appropriate sensing efficiency.

Keywords: Canonical Particle Swarm optimization, Artificial Bee Colony optimization, Internet of Things.

OAS053

ONLINE FOOD COURT PAYMENT PROCESSING USING BLOCKCHAIN

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Abstract

It is a web-based application designed commonly for use in Food & beverage based enterprises. These applications tackle the issues of Manual Labour cost in the food court bringing about a rapid expansion in the Overall business Model. It also provides the proprietor of the restaurant to administer and make modifications as per the stipulations in their restaurant. The consumer can order their food by accessing the application through their mobile browser. The retailer can easily complete the order in time, as there will be a streamlined check-in for the availability of ingredients. In this paper, we exemplify the overall description and generalized software requirements specification of the entire systematic structure designed for use in different food courts. Our application imparts the restaurant employees to manage their online cuisines and keep track of all the orders placed by their consumers. Furthermore, the Customer makes Payment either using the existing Payment Gateways or block chain-based Payment. Eventually, this paper is projected to reduce the overheads of Payment gateways and improvise Data security in a precise manner.

Keywords: *Payment Gateway, Block chain, Data Security***.**

OAS054

COMPUTATION OFFLOADING AND TASK SCHEDULING FOR DNN-BASED APPLICATIONS IN CLOUD-EDGE COMPUTING

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Abstract

Cloud Computing is rapidly growing and many more cloud providers are emerging. This project says that how the incoming tasks are scheduled in the cloud. In this, we present a new classifier that combines the K-Nearest Neighbor (KNN) algorithm with the Naive Bayes algorithm. Computation offloading technology offers a feasible solution by offloading some computation-intensive tasks of the K-Nearest Neighbor algorithm and the Naive Bayes algorithm to edges or remote clouds that are equipped with sufficient resources. However, the offloading process might lead to excessive delays and thus seriously affect the user experience. To address this important problem, we first regard the average response time of multi-task parallel scheduling as our optimization goal. Finally, the Deep Neural Network (DNN) algorithm based applications are proposed to solve the problem. Offloading a task means how the task is scheduled in Virtual Machine, first, the task is separated into types(small, medium, large and extra-large) after that it sees which Virtual Machine is available to load the task. Suppose, if the incoming task is too-large then we have to offload it by separating the task into sub-task as 6 operations (split, combine, merge, demerge, promote and demote).To avoid the burden in the Virtual Machine, We analyze the above operations by using the K-Nearest Neighbour (KNN) algorithm with the Naive Bayes algorithm and then scheduled in the Virtual Machine. We want to show that the K-Nearest Neighbour (KNN) algorithm with the Naive Bayes algorithm shows better performance than Deep Neural Network(DNN).

Keywords: *Naive Bayes algorithm, Deep Neural Network (DNN), K-Nearest Neighbour (KNN)*

OAS057

REAL TIME ACCIDENT NOTIFIER

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Abstract

One of the most common causes of fatalities was car collisions. This could be due to poor road conditions, bad weather, and lack of driving techniques. If medical assistance is not made available immediately after the accident, the fatality rate rises, thus adjusting the emergency services to the severity of the accident and minimizing assistance time. Due to a user-friendly and cost-effective interface, these communication services and hardware devices can be made easily accessible to any person. This paper proposes a less complex, new and intelligent system that can detect road accidents using current communication technologies. Smartphone's and their on-board sensors (such as GPS receivers and accelerometers) are promising instruments for designing such systems. First, we define the main road accident problem, second, we discuss its ability to detect false positives as well as its accident capabilities, and third, we discuss how Real Time Accident Notifier can minimize overall traffic congestion and accidents.

Keywords*: Road Accident, Intelligent system, GPS receivers, traffic congestion.*

OAS064

IDENTIFICATION OF VARIATIONS IN METEOROLOGICAL PARAMETERS AT OOTY DUE TO TEMPERATURE DIFFERENCE USING SPSS SOFTWARE

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Abstract

Due to increase in earth's average temperature global warming is evident in recent decades. Because of this climate change phenomenon, world's mean surface temperature lifted by 0.6°C in the course of twentieth century. Present paper tries to investigate the influence of global warming on meteorological parameters for high altitude region Ooty, Tamilnadu by segregating/analyzing the data collected from Indian Meteorological Department, Chennai for past three decades. With the help of statistical analysis such as Descriptive Analysis and Correlation Co-efficient Analysis, recent annual/seasonal warming trends are computed in the context of climate change. Also the ratios are used to identify the impacts of temperature difference on other meteorological parameters by utilizing Statistical Package for Social Sciences (ver. 14.0) software. Finally variations in Rainfall and runoff are calculated with reference to the differences in annual temperature.

Keywords: *Temperature, Global warming, Rainfall, Runoff, Descriptive analysis, Correlation Co-efficient Analysis and Statistical Package for Social Sciences.*

OAS065

SALES PREDICTION USING MACHINE LEARNING APPROACHES

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Abstract

For the successful business, several factors are considered and prediction is made for the sales of the product. Here, the sales pediction is proposed to forecast the sales of Rossamann stores using machine learning algorithms. Sales forecasting is done by analyzing customer purchasing behaviour and it plays an important role in modern business intelligence. Forecasting future sales demand is key to business and business planning and activities. Forecasting helps business organizations to make improvements, to make changes to business plans and to provide a stock storage solution. Forecasts are determined by the use of data from the past and the consideration of known factors in the future. Sales forecasting plays a vital role in strategic planning and market strategy for every company to assess past and present sales statistics and predict potential results. Overall, accurate sales forecasting helps the company to run more productively and efficiently, to save money on forecasts or predictions described as statistical modeling, machine learning. In this study, the linear regression and logistic regression model will be trained and tested for our dataset. The data is processed to select the features and extract those features. Accurate projections make it easier for the shop to boost demand growth and a higher degree of sales generation. It produces better prediction rate.

OAS066

ANALYSIS OF HIRING A FREELANCE CODER WEBSITE

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Abstract

The extraordinary episode of the 2019 novel Corona-virus named as COVID-19 by the World Health Organization (WHO) has put various governments around the globe in a shaky position. Since the corona virus infection spreads very quickly all over the world, many employers have decided to secure themselves as freelancers and to shift to remote work.The current system offers project outsourcing in a manual work. Hiring a Freelance Coder is designed to develop an interface for the organization and the freelancing professionals using responsive web design. This article highlights the project outsourcing through virtual environment there is no need of real physical meet up. The working flow of this website, the company and the freelancer must register their details, the registration details are stored in a centralized database. The registration details include the login aspect for each user. The company posts its project requirement to this application by the given category. The freelancer can search and view any project posted on this application and the freelancer can bid the project to outsource from the company. The entire bid details can be verified by the company and can approve the bid. The company can monitor the work status given by the freelancer and ask queries. The subscription and newsletter will be provided for the users to update the new project posted on this website. Some companies also offer an internship. The internship candidate can view the internship list and they can apply and send a resume.

Keywords: *Analysis, Freelancing, Company, Website, Project Outsourcing, Coder*

OAS068

AI BASED CHATBOT IN FOOD INDUSTRY USING NATURAL LANGUAGE PROCESSING

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Abstract

Chatbot is a computer application that cooperates with clients utilizing regular language processing. Much of the time, it can give excellent client driven proposals. Therefore, Chabot is turning into a necessary part for the upcoming years of customer services. Now-a-days, chatbots are becoming more popular in fields like e-commerce, travel and tourism, universities, personal assistants etc., One of the main problems that food industries facing is that customers could not able to get their updated details of the food products. Usage of search engines may solve their queries but it takes a lot of search time and sometimes the answer for the queries will not be available. Additionally, web indexes are not as adaptable as chatbot in providing one to one correspondence inquiry. The objective of this paper is to develop an Artificial Intelligence (AI) where each activity can be thought to be a sure inquiry that is given to the chatbot, it responds to the user's query by applying group examination on a bunch of product related data. The outcome, at that point, is taken care of into Chabot's information base. This chatbot will help users to get data on which potential destinations they need to visit ideally on the off chance that they are under restricted time-opening requirements.

Keywords: *AI, Chatbot, slot filling, Natural Language Processing, Food industry*

OAS072

FUTURE: HCI IN PUBLIC CONVEYANCES

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Abstract

Automated vehicles are merging more and more progressively in this recent era with greater safety. Beyond cars, there are tractors, trucks and trains that drive us instead of we driving them. Exploring the autonomous bus transportation with the capability to drive back and forth, or in two, opposite directions and side to side with fail-safe operation for passenger transportation. Here Artificial intelligence is used to assist in hindrance detection, self-localization, and route planning. Also evaluating the information from a passenger's perspective, which includes tokening and emergency situations. It is decked out in the safety technology with combination of multiple radar sensors and cameras in each corner, which virtually abolishing flaws as well as providing idleness in case a sensor fails. They could also contribute in trouble-free congestion and lessen the demand of new roads.

DEPARTMENT OF FOOD TECHNOLOGY

The department was started in the year 2006 with B. Tech. program & M. Tech. from 2013 onwards in Food Technology. The department is also a Ph.D. research center recognized by Anna University, Chennai. It has been regularly a basis for producing efficient technologists with outstanding academics & overall performance in addition to pioneering the development of innovative technologies for conservation and processing of raw foods and value addition. Many sponsored seminars/ workshops by ICMR, DST, DBT, MoES, NSTEDB, AICTE has been conducted and organized national and international conferences. It has an established Research laboratory funded by UGC and MOFPI. Some of the sophisticated research facilities in the department are HPLC, Microwave Assisted Drier, UASB Reactor etc., and has laboratories for Microbiology, Biochemistry, Dairy Engineering, Food Process Engineering, Fruit & Vegetable Processing, Food Packaging, Baking & Confectionery and Food Analysis and Quality Control. It maintains good placement in leading food industries like ITC, Parle Agro, Hatsun Agro Pvt. Ltd., Cavinkare Pvt. Ltd. etc. It has MOU signed with various industries and Institutes/ Universities including SKM Egg Products, Vinu Foods, Angel Starch and IIFPT.

"It has become appallingly obvious that our technology has exceeded our humanity."
— Albert Einstein

Estd : 1984

e-CONCEPT 2021

 # Published by
KONGU ENGINEERING COLLEGE
An Autonomous Institution Accredited by NAAC "A" Grade
Perundurai, Erode-638060, Tamil Nadu

 # Printed by
TITAANIC PRINTERS
136, TVS Street, Near P.S.Park Traffic Signal, NMS Compound, Erode Fort, Erode, Tamil Nadu 638001

ISBN 978-93-5445-363-2