



# ANDHRA LOYOLA COLLEGE (AUTONOMOUS)

Vijayawada - 520 008, Andhra Pradesh, India

Accredited at A+ Grade with CGPA of 3.66 in III Cycle by NAAC

All India 94<sup>th</sup> Rank NIRF 2022, MoE, Govt. of India,

Selected under Star College Scheme by DST - FIST Govt. of India

## THREE DAY INTERNATIONAL CONFERENCE ON

# “Emerging Trends in Science, Engineering and Technology

(ICESET-2023)”

20 - 22 February 2023

Organized by **Department of Electronics**

In Association with **SOLETE** (Society for Learning Technologies)



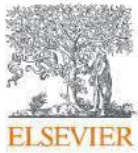
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# **PROCEEDINGS OF ICESET – 2023**

**International Conference on Emerging Trends  
in Science, Engineering and Technology**

**(ICESET - 2023)**

**20 - 22 FEBRUARY 2023**



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**Editor**

**Dr. Battu Balaji Bhanu**

Head, Department of Electronics,  
Andhra Loyola College (Autonomous),  
Vijayawada – 520008

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**in Association with SOLETE**





**Rev. Fr. P. Bala Showry, S.J.,  
Rector, Andhra Loyola College  
Patron, ICESET-2023**

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### **MESSAGE**

I am very glad to know that the Department of Electronics is hosting an "International Conference on Emerging Trends in Science, Engineering, and Technology" (ICESET-2023), from 20<sup>th</sup> to 22<sup>nd</sup> February 2023, as a specific and distinct field of science and engineering, is a very fascinating discipline from the point of view of both the scholarly research and practical applications of it. The topic chosen is both interesting and contemporaneous. It's the need of the hour to enlighten, especially the young generation on such areas of science and technology. I know that it's made possible by the collective efforts of all the members of the department under the able guidance of Dr. B. Balaji Bhanu, the Organising Secretary. I congratulate the faculty and the students on visualising and planning for such an academically inspiring international conference.

I am sure, the discussions and deliberations at this conference, will instil in all the participants, a renewed enthusiasm and a humongous curiosity for the newest advancements in Science, Engineering and Technology. At this juncture, I appreciate and congratulate the instructors, staff and students of the department of Electronics for their strenuous efforts and meticulous planning to organize this international conference and other such related activities. I also express my profound gratitude to all the participants from other Institutions for attending this conference and my best wishes and blessings for its big success.

Wishing you all good luck!

Date: 20<sup>th</sup> February 2023



Rev. Fr. Dr. M. Sagayaraj, S.J.,  
Correspondent, Andhra Loyola College  
Patron, ICESET-2023

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### MESSAGE

***“What we have learnt is handful, yet to learn is infinite”. Let us learn endlessly in our lives.***

Warm greetings and welcome to Andhra Loyola College and to the three-day “International Conference on Emerging Trends in Science, Engineering, and Technology (ICESET-2023)”. It is my great pleasure to serve as patron for this conference organized by Department of Electronics in association with SOLETE. The aim of this conference is to provide an international forum that hubs together the researchers, scientists, academicians, corporate professionals and technically sound students from all over the world under a roof to make it as a phenomenal, informative and interactive session which is acutely needed to pave the way to promote research advancements in the field of Engineering Technology and Science.

I hope this conference, gives you fine opportunity to engage with your peers to discuss your ideas for research and practice and that you may ask probing questions of the presenters to gain deeper knowledge. There will be plenty of opportunities for collaboration. We will all benefit from our combined participation at this conference and make it a grand success.

Date: 20<sup>th</sup> February 2023



Type your text

**Rev. Fr. Dr. G.A.P. Kishore, S.J.**  
**Principal, Andhra Loyola College**  
**(Autonomous)**  
**Chairman, ICESET-2023**

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### **MESSAGE**

I am glad that our Electronics Department is organizing an International Conference on “Emerging Trends in Science, Engineering and Technology – 2023” (ICESET-2023) from 20<sup>th</sup> to 22<sup>nd</sup> February 2023. I sincerely wish and hope that this Conference provides a platform for Professionals, Academicians and Researchers to share their knowledge, exchange their experiences and fruits of their research in the fields leading to possible future collaborations for a better world and welfare of the humanity.

Date: 20<sup>th</sup> February 2023





**Rev. Fr. Dr. I. Lourduraj SJ**  
**Head, Department of Visual Communication & Electronic Media**  
**In charge of Internship for the 3rd Year undergraduate students**  
**Vice Principal (UG & PG) Principal,**  
**Andhra Loyola College (Autonomous)**  
**Vice-Chairman, ICESSET-2023**

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### MESSAGE

The department of Electronics is conducting an international conference titled “Emerging Trends in Science, Engineering and Technology (ICESSET 2023)” on the 20th and 21st of February 2023 at Andhra Loyola College, Vijayawada. The conference will see many research papers being read out from different parts of the country and abroad like USA, UK and Canada.

The department of Electronics is an innovative one and the students who are admitted into the programme scale greater heights in this field of education. The cutting edge of this department is the internship in the 5th or 6th semester. The students try out the techniques learned during the 5 semesters in the industry. They go for internships in Railways and in reputed electronics industries. They make their own LED panels, LED bulbs and even sell them. The beauty of the department is that the students who join this program are employed.

I congratulate Dr Balaji Bhanu, head of the department of electronics for organizing this international conference. The department is a successful one because of the dedicated faculty who teach the students the new trends in electronics day in and day out. May the conference bring about knowledge sharing among the students and the research scholars.

Date: 20<sup>th</sup> February 2023



**Rev. Fr. K. Anil Kumar, S.J.**  
**Vice - Principal, Andhra Loyola College (Autonomous)**  
**Vice - Chairman, ICESET-2023**

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### **MESSAGE**

I would like to take a moment to express my sincerest appreciation and congratulations to the Department of Electronics, in collaboration with SOLETE, for organizing a three-day International Conference on “Emerging Trends in Science, Engineering and Technology (ICESET-2023)”, which provides the forum to disseminate original results and new challenges facing the field of science and engineering. The dedication, hard work, and attention to detail that the team put into planning and execution of the prestigious seminar will definitely bear fruit in the form of an enlightening experience to all the participants as they get exposed to copious advanced information through presentations and various talks.

Emerging trends such as Artificial Intelligence (AI), Machine Learning (ML), Quantum and edge computing, Internet of things (Io T), Robotics and automation, sustainable energy, advanced material and Nano technology, space exploration and commercialization etc. are rapidly used in a wide range of applications, from personalized medicine to self-driving cars, performing complex calculations at incredible speed, connecting objects to the internet, allowing for increased automation, efficiency and data collection, is expected to have a major impact on many areas of science and technology.

Therefore, International seminar of this kind will help to throw light on the driving significant advancements in a wide range of industries and applications. I am sure, participants will start understanding that keeping up with these emerging trends is critical for individuals and organizations, seeking to stay at the forefront of scientific and technological innovation.

Date: 20<sup>th</sup> February 2023



**Rev. Fr. Dr. Y.T. Prabhu, S.J.**  
**Vice - Principal, Andhra Loyola College (Autonomous)**  
**Vice - Chairman, ICESSET-2023**

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### **MESSAGE**

How rejoicing it is to know that the Department of Electronics, in association with SOLETE, is organizing a Three-Day international Conference from 20 to 22 February 2022 'Emerging trends in Science, Engineering and technology (ICESSET-2023)'

In modern society, the Internet of Things has become essential for people to lead their lives and work smarter. To have control over their domestic lives living in automated homes and to run their business with insights into the performance of machines and supply chain and logistics operations, IoT is a technological boon. It is the everyday language of both personal and professional life.

I commend the management, especially Rev. Fr. Dr. M. Sagayaraj, SJ, the Correspondent, and Rev. Fr. Dr. G.A. Peter Kishore, SJ, the Principal, for their support and sustenance for the cause. The role played by the members of the Department by lending a hand is estimable. Hearty congratulations to Dr. Balaji Bhanu, the dynamic Head of the Department and Organising Secretary on conceiving the idea of conducting the conference on such a modern theme.

I hope the deliberations and discussions that are going to take place among the learned scholars in the conference will bear fruit in the days to come.

Date: 20<sup>th</sup> February 2023



**Dr. B. Balaji Bhanu**  
**Head, Dept. of Electronics**  
**Andhra Loyola College (Autonomous)**  
**Organizing Secretary, ICESSET-2023**

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### **MESSAGE**

As the organising secretary of the 'International Conference on Emerging trends in Science, Engineering and Technology' (ICESSET-2023), I am delighted to welcome all the participants, delegates, keynote speakers, resource persons, scholars, practitioners and my beloved students to this prestigious event.

Our conference has brought all of us together from around the world to exchange ideas and explore the latest advancements in the fields of science, engineering and technology.

Over the course of the conference, we will be hosting a series of keynote lectures, plenary sessions, and panel discussions, all designed to promote interdisciplinary research and development. This is an excellent opportunity for all attendees to present their research, network with their peers, and establish fruitful collaborations that could pave the way for future breakthroughs in the field.

Our conference will cover a broad range of topics, including emerging trends in science, engineering, and technology, as well as the latest research in various sub-disciplines. We have a diverse range of speakers each of whom brings unique insights and perspectives to the discussion.

As the Organizing Secretary, my team and I have worked tirelessly to ensure that this conference is a resounding success. I hope that you find this conference informative, engaging, and a great opportunity to connect with your peers from around the world. We have taken great care to ensure that all participants have a productive and enriching experience.

I would like to take this opportunity to thank all of our speakers, participants for their valuable contributions to this conference and college management for their encouragement and constant support. I appreciate our colleagues for their cooperation & involvement in organizing this 3-day conference successfully and students for their active participation. I express my gratitude to the support staff whose functioning means a lot for the smooth conduct of the conference.

Once again, welcome to the International Conference on Emerging Trends in Science, Engineering, and Technology.

Date: 20<sup>th</sup> February 2023

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## A Literature Review of Non-Isolated High Gain DC/DC Converters

**Krishna. P**

Assistant Professor

Electrical and Electronics Engineering Department  
Rajiv Gandhi University of Knowledge Technologies  
Nuzvid-521202, Andhra Pradesh  
Email: pkrishnaeee@gmail.com

### Abstract:

In the recent times, lot of research work is going on in the field of high gain DC/DC converters, due to the deployment of distributed power generation using renewable energy sources like solar and wind, electric vehicles, battery charging, and fuel cells. This paper has made comparative study on several topologies of high gain DC/DC converter and the applications where these topologies can be used. Taking into account, the performance of the non-isolated high gain DC/DC converters for various applications, the converters are classified into several categories and reviewed in this paper. In the literature, there are several techniques available to increase the voltage from one level to another level depending on the application; in which energy storage elements along with semiconductor devices like transistor and diode are used (the count of elements may vary from one topology to another). Due to the deployment of more electric vehicles, and battery storage, in which efficiency, energy density, and weight are a matter of interest, extended the research on various high gain DC/DC converters. The major applications of high gain DC/DC converter are found in electric drive system and battery energy storage. Finally, the applications of different converter configurations are presented, discussed, and summarized.

**Keywords:** Renewable energy sources, electric vehicle, battery, dc/dc converter

## A Note on Gas Leakage Monitoring and Detection using Internet of Things

Satyendra Paruchuri <sup>1</sup>, Venugopala Rao Paruchuri <sup>2</sup>

<sup>1</sup>Masters in Computer Science Student, University of Texas at Arlington, Texas State, USA  
Email: [paruchurisatyendra99@gmail.com](mailto:paruchurisatyendra99@gmail.com)

<sup>2</sup>Department of Mathematics, Andhra Loyola College (Autonomous), Vijayawada, A.P., India  
Email: [venugopalparuchuri@gmail.com](mailto:venugopalparuchuri@gmail.com)

### Abstract:

Internet of Things has wide spread applications in many fields. The significant improvement in the field of Internet of Things has made the human life more sophisticated. In industries the concept of smart industries is growing rapidly, most of the machine tools are designed with Internet of Things. Gas leakage problems can be detected using Internet of Things and necessary measures have to be taken to avoid it. Continuous monitoring of atmosphere is a crucial component to detect gas leakage and can only be done using artificial means. This paper proposes a system which helps to detect gas leakages in industries and tries to minimize the circumstances which lead to gas leakage. It is also important to monitor the temperature and pressure in the containers of gases to avoid bursting of containers which leads to sudden gas leakage. The system is a Cloud based Internet of Things application which receives sensor information and reacts accordingly. Our system contains auto-alarm mechanism which sends information to nearby control systems like fire station to reduce the latency and evacuate nearby people to avoid human loss in case of emergency.

**Keywords:** Gas leakage detection, Internet of Things, Auto-alarm mechanism.

## SCR Based DC Motor Controlling for Fire Safety Circuit

**M.George**

Dept. of Electronics, Andhra Loyola College (Autonomous), Vijayawada.

Email ID:- george062729@gmail.com

### **Abstract:**

This document describes the design and implementation of direct current motor monitoring through the use of SCRs that can be used for fire safety. In the characteristics of SCR which is Silicon Controlled Rectifier we observe that the anode current is carried only by triggering the gate terminal. In the design of gate triggering methods, several sensors may be used. In this document, as per the title of the Fire Safety Application, I have considered temperature as the gate trigger parameter. The design of this proposal includes the SCR apparatus, the DC motor, the DC power supply for the DC motor and the temperature sensor. The DC motor, DC power supply and SCR device anode, cathode terminals are connected in a series combination as forward bias condition. Even if we apply the required voltage to that effect, the DC motor does not turn on. Because absence of gate triggering. Here, as per the discussion I considered temperature as the gate triggering parameter, I will connect a temperature sensor gate and cathode terminals. When the sensor detects a low temperature around it, a small amount of current can be observed through the gate, which is insufficient to trigger the SCR gate terminal. I'll raise the temperature and record it for reference. When the gate terminal tripped with enough current, we observe the DC motor on condition. This concept can be applied at fire safety application.

**Key words:** Silicon Controlled Rectifier (SCR), DC motor, temperature sensor, fire safety.

## Leveraging Digital Disruption with AI and IoT Technologies

**B. Balaji Bhanu<sup>1</sup>, PVS Sai Ram<sup>2</sup>**

<sup>1</sup>Dept. of Electronics, Andhra Loyola College, Vijayawada, AP, India

<sup>2</sup>Dept. of Physics, Andhra Loyola College, Vijayawada, AP, India

Email: bbalajibhanu@gmail.com

### **Abstract:**

A strong foundation in emerging technologies such as Artificial Intelligence (AI), Internet of Things (IoT), cloud computing, and data analytics is essential to keep pace with digital disruption. Whereas AI and IoT are transforming the digital life of individuals by offering new ways to interact with technology. AI can analyze large amounts of data and provide insights and predictions, enabling smarter decision-making and personalized experiences. IoT connects devices and appliances to the internet, allowing for remote monitoring and control. This creates new opportunities for automation and optimization, making everyday tasks easier and more efficient. However, these technologies also raise concerns about privacy and security, as personal information is being collected and stored in the cloud. It's important for individuals to be aware of these issues and take steps to protect their digital privacy. The integration of AI and IoT have the potential to greatly improve the lifestyle of individuals by making their daily tasks more efficient and convenient in Smart home automation, Health and wellness, Improved accessibility, Smart assistants, E-commerce and online shopping, Transportation, Energy management etc. IoT and AI technologies are playing a major role in the leveraging digital disruption of our lives, transforming the way we live, work, and interact with each other. By leveraging the power of these technologies, individuals and organizations can enhance their decision-making, improve their operations, and create a more connected, automated and efficient world.

**Keywords:** IoT, AI, smart technologies, automation.

## TSCH Enabled MANET for Efficient Routing in IIOT Applications Through Wireless Sensor

**Dr. Besta Suresh Babu<sup>1</sup>,**

Dept. of computer science, SBGNS Rural PU College, Chikkaballapura(Dist), Karnataka, India. Email: [sureshbesta2244@gmail.com](mailto:sureshbesta2244@gmail.com)

**Dr. Mohammed Ali Hussain<sup>2</sup>,**

Professor, Dept. of Computer Science and Engineering, KL University, Guntur (Dist.), Andhra Pradesh, India.

### Abstract

Wearable sensors will be integrated into future IIoT applications to monitor human activity in real-time. An enormous amount of continuous data at a huge rate is generated from these sensor devices and they get power supply from the batteries. For this, they are restricted to utilize wireless protocols that are Bluetooth Low Energy as well as IEEE 802.15.4. TSCH MAC is a potential solution for supplying IIOT applications that are positioned in an environment disposed to interference. We may solve these obstacles as well as contests in building a REES model for TSCH MANET. The scheduling process becomes very challenging, as we know that it has an unpredictable nature of providing wireless links as well as always changing data source locations. The scheduling procedure wastes resources by reserving resources in some worst-case scenarios, such as a high predicted data rate. Both dedicated and shared slots are included in the established REES paradigm. Besides this part, each pair of communications systems can trigger its respective slots in an adaptable manner. Because of this, the fairness and packet delivery are both significantly enhanced, and the idle listening overhead generated by unused slots is significantly minimized. If there is a rise in the volume of traffic, a MANET system will automatically trigger additional slots, removing the necessity to reorganize the schedule.

Keywords – IEEE 802.15.4e networks, MANET, TSCH, REES, Industrial Internet of Things

## An Intelligent Home Automation System based on the Internet of Things

**N. Lakshmikanth**

Assistant Professor, Department of Electronics, Andhra Loyola College (Autonomous)  
Email: [chinnanuseti@gmail.com](mailto:chinnanuseti@gmail.com)

### **Abstract:**

The rapid development of information technology has led to the widespread adoption of the Internet of Things (IoT) in various aspects of daily life. One popular application of IoT is the design of intelligent home systems, which utilize Wi-Fi and ZigBee technology. As the IoT continues to expand, the intelligent home system is becoming increasingly important in our daily lives. **Methods:** In this paper, we propose an intelligent home design system based on IoT technology, which includes a range of sensors for monitoring various environmental factors, such as temperature, moisture, body heat, illumination, air quality, and PM2.5. By incorporating these sensors into the system, the intelligent home can automatically adjust the environmental conditions to optimize comfort and convenience for the occupants. The proposed intelligent home system is well-suited for real-time monitoring and control of various environmental factors, such as temperature, humidity, illumination, air quality, fire safety, and security. In contrast to existing systems, this design offers a comfortable, safe, and user-friendly environment, with a range of customizable features. In conclusion, the ZigBee-based intelligent home design system has the potential to revolutionize the living conditions for elderly citizens, as well as improving their quality of life. The system includes features designed specifically for empty-nesters, providing a more favourable living environment that is tailored to their needs. Ultimately, this system offers a promising solution for enhancing the comfort and safety of the home, while also improving the quality of life for its occupants.

**Keywords:** CC2530 chip, WIFI; ZigBee, moisture sensitive circuit, internet of effects, detectors.

## First Principle Studies on Novel Ru<sub>2</sub>TiMn Heusler Alloy for Thermoelectric Properties

Karumuri Venkanna<sup>1\*</sup>, Ch Prashanth<sup>1</sup>, Dr P Rambabu<sup>2</sup> and Dr J Krishnamurthy<sup>1</sup>

<sup>1</sup>Department of Physics, School of Sciences, National Institute of Technology, Andhra Pradesh, India

\*Department of Physics, SGA Government Degree College, Yellamanchili, Andhra Pradesh, India.

<sup>2</sup>Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur, India.

\*Corresponding author: karumuri.venkanna@gmail.com

### Abstract

We report the structural stability, electronic, magnetic, thermodynamic and thermoelectric properties of novel Ru<sub>2</sub>TiMn Heusler alloys using first principle studies based on density functional theory (DFT). With the reports of martensitic phase transformation from cubic to tetragonal structural phase in this series of samples, Ru<sub>2</sub>TiMn alloy is found to be stable in tetragonal phase at  $c/a$  ratio 0.92, fitted with Birch-Murnaghan equation of state. The observed negative formation energy making it the alloy is physically synthesizable. Further non-zero density of states (DOS) in both spin-up and spin-down channels near to Fermi energy with no energy gap proves its metallic character. Absence of imaginary frequencies in phonon dispersion spectrum confirms the dynamical stability of the compound. Integration of DOS indicates the magnetic moment of a compound and estimated magnetic moment is  $3.025\mu_B$ . It is observed that major contribution for magnetic moment is coming from Mn atoms. The calculations of different thermodynamic properties such as entropy, free energy and specific heat at constant volume ( $C_V$ ) of Ru<sub>2</sub>TiMn alloy are performed by varying the temperature from 0 K to 2000 K. To estimate thermoelectric properties of Ru<sub>2</sub>TiMn alloy as a function of chemical potential, we have used the BoltzTrap code based on the Boltzmann model via Boltzmann transport equation. The figure of merit ( $zT$ ) is very large as calculated thermal conductivity is low and Seebeck coefficient is large value of about  $100 \mu V/K$ , shows that our Ru<sub>2</sub>TiMn alloy can be used for powerful thermoelectric devices.

**Key words:** Heusler alloy, martensitic phase, thermoelectric materials, dynamical stability

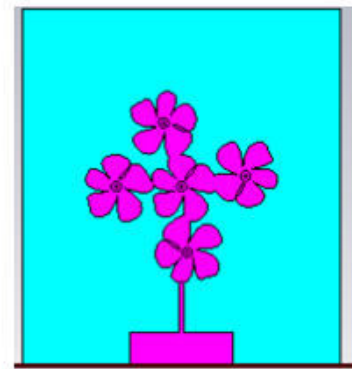
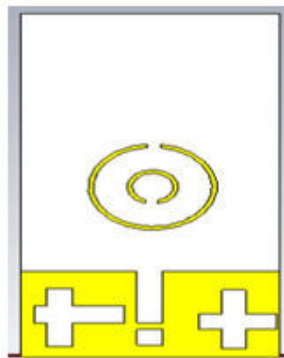
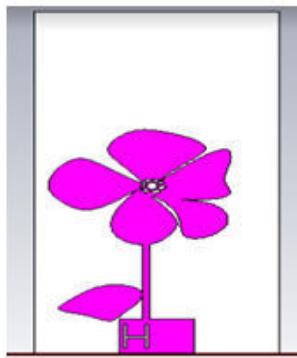
## Periwinkle Shaped Patch Antenna for UWB Applications

S.Bhavani<sup>1</sup>, Dr.T.Shanmuganantham<sup>2</sup>, O.Harshitha  
Komali<sup>3</sup>,M.Giridhar<sup>4</sup>,M.Lekhana<sup>5</sup>,P.Divya<sup>6</sup>

<sup>1,3-6</sup> Seshadri Rao Gudlavalleru Engineering College, Gudlavalleru  
<sup>2</sup> Associate Professor & HoD , DEE,Pondicherry University, Pondicherry.  
Mail id:ammav10@gmail.com

**Abstract-** This paper introduces a monopole antenna with radiating patch antenna in the form of periwinkle flowers. This antenna covers the 3.1 to 10.6 GHz frequency range of the UWB working band. Due to the arrangement of the flower's leaves and the partial ground's slots, several notches are produced. The suggested antenna has a modest profile and is 14X14 mm<sup>2</sup>. The substrates for this design are Fr-4 and Jeans. It has a reflection coefficient below -10 dB and covers the UWB spectrum. CST Microwave Studio is used to create and simulate the periwinkle flower antenna. It produces good gain (5dBi), VSWR, and impedance bandwidth (80% efficiency). Fractal flower pattern also studied to get the multiple band operation. The wireless applications are the major emphasis of the suggested antenna.

**Keywords:** Patch Antenna, Periwinkle, UWB ,Wireless.





## Strawberry Shaped Patch Antenna for Biomedical Applications

S.Bhavani<sup>1</sup>, Dr.T.Shanmuganantham<sup>2</sup>, M.Tulasi<sup>3</sup>,P.Vardhana Varma Raju<sup>4</sup>,M.Jhansi<sup>5</sup>,P.Vasanthi<sup>6</sup>

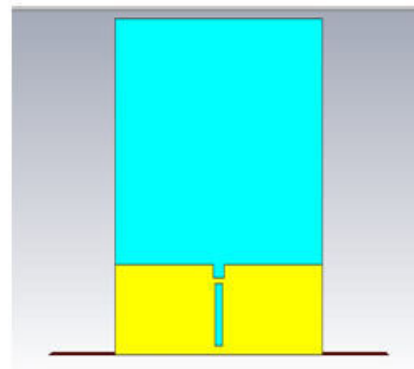
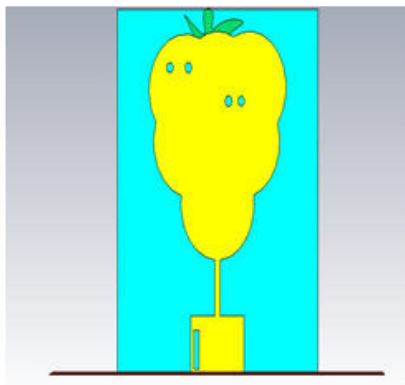
<sup>1,3-6</sup> Seshadri Rao Gudlavalleru Engineering College, Gudlavalleru

<sup>2</sup> Associate Professor & HoD , DEE,Pondicherry University, Pondicherry.  
mail id: vasanthipeteti2001@gmail.com.

### Abstract-

The design of a strawberry-shaped antenna for biomedical applications is presented in this work. The suggested antenna has a small footprint, measuring 22X26mm<sup>2</sup>. Testing is conducted using both jeans and fr-4 substrates. CST Microwave Studio is used for the antenna's complete design and modeling. To find any tissue anomalies, this antenna is tested on phantoms of the lung and brain. It was evident from the simulation findings that the reflection coefficient changed both with and without tissue defects. Slots are inserted in the patch and ground to produce an impedance bandwidth of 3.1–10.6 GHz. With a gain of 4.8 dBi, an 82% radiation efficiency, and a peak reflection coefficient of -32 dB, the suggested antenna performs well.

**Keywords:** Bio medical, Patch Antenna, Strawberry, UWB.



## Design of Epitope Based Vaccine Against MCC

Valluri.V. V. Madhavi<sup>1</sup>, Anupama .A. Manne<sup>2</sup>, Sahithi Kamepalli<sup>1</sup>, D.Samyuktha<sup>1</sup>, D.Raj Kumar<sup>1</sup>, Kanaka Durga Devi.N\*<sup>1</sup>

<sup>1</sup>KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India.

<sup>2</sup>Department of Civil Engineering, PVPSIT, Kanuru, Vijayawada, Andhra Pradesh, India.

### Abstract

Merkel Cell Carcinoma (MCC) is a rare neuroendocrine skin tumour that is brought on by a member of the Polyomaviridae family, the merkel cell polyoma virus (MCPyV). It gained popularity as a result of neurosecretory symptoms and neuro-endocrine markers in neoplastic cells, but there is no vaccination or specific medication for treatment. A new MCPyV vaccination is therefore necessary. The objective of the current work was to discover conserved B- and T-cell epitopes for the MCPyV glycoprotein that may be crucial in developing a vaccine against the MCC infection. Immunoinformatic techniques are used to create a multi-epitope-based vaccination for the current investigation. The membrane glycoprotein polyprotein of MCPyV was employed as a target protein to predict B and T-cell epitopes, and predicted B and T-cell epitopes were further tested for immunogenicity, allergenicity, toxicity, and conservancy. The vaccine used in this study was created utilising the membrane glycoprotein polyprotein of MCPyV using a reverse vaccination strategy, and it is anticipated that the created vaccine will demonstrate its effectiveness in the management and prevention of MCPyV.

**Keywords:** T-and B-cell epitopes, Insilico studies, MCC Vaccine design, MCPyV glycoprotein

## An In Vitro Assessment of Anthelmintic Activity of Albendazole on Indian Worms

Tanneeru Anasurya<sup>1</sup>, Anupama .A. Manne<sup>2</sup>, Vemuri Sravya<sup>1</sup>, Vejandla Swathi Lakshmi<sup>1</sup>, Sahithi Kamepalli<sup>1</sup>, Kanaka Durga Devi.N<sup>\*1</sup>

<sup>1</sup>KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India.

<sup>2</sup>Department of Civil Engineering, PVPSIT, Kanuru, Vijayawada, Andhra Pradesh, India.

### Abstract

In all allopathic systems of medicine numerous formulations are being prescribed for the anthelmintic activity. The anthelmintic activity of these formulations has not been assessed analytically to acknowledge the effect of these formulations. Helminths infections, Frequently capacitate helminthiasis are among the most insidious infection and a premier retrogressive disease arising due to low socioeconomic status and poor sanitization. However, development of resistance in helminths against conventional anthelmintics is the prominent problem in treatment of helminthes disease. Henceforth, we are correlating the anthelmintic activity of generic and brand allopathic suspension dosage forms which exhibit higher rate of bioavailability comparatively, to elucidate the potential formulation. The mechanism of action of Albendazole is to antecedent paralysis of worms and to evacuate them in the feaces. Albendazole causes deleterious modifications in the intestinal cells of the worm. Degenerative changes in organs like endoplasmic reticulum, the mitochondria results in decreased production of adenosine triphosphate (ATP), which is the energy necessary for the survival of the helminthes. Due to diminished energy production, the parasite is immobilized and eventually dies. In this study, suspensions of albendazole were taken for the in vitro comparative studies on the anthelmintic activity against Indian worms (pheretimaposthuma). So here, Different concentrations (10,20,30,40mg/ml) of these formulations were used for the activity and 0.5% of Nacl as reference standard. The results were conveyed in terms of time in minutes to address the paralysis and death of earthworms. The outcomes of the current study illustrate that the combination form of albendazole (albendazole and ivermectin) potentiate to paralyze the earthworms and also caused death in a short time comparatively.

**Keywords:** Allopathic Systems, Anthelmintic Activity, Albendazole, Pheretimaposthuma

## **In-Vitro Synergistic Activity of Drug Combinations against Bacterial Strains**

**Naveen Babu Kilaru<sup>1</sup>, Manne Anupama Ammulu<sup>2</sup>, Motupalli Sankeerth Kumar<sup>1</sup>**

**Mitta Keerthana<sup>1</sup>, Koduri Prathyusha<sup>1</sup>, Kanaka Durga Devi Nelluri<sup>1\*</sup>**

<sup>1</sup>Department of Pharmaceutics and Biotechnology, KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India.

<sup>2</sup>Department of Civil Engineering, PVP Siddhartha Institute of Technology, Kanuru, Vijayawada, Andhra Pradesh, India

### **Abstract**

The purpose of this research was to elucidate the Synergistic/ Antagonistic Activity of Azithromycin, Erythromycin and Salicylic Acid and in combinations against Various Strains. Synergistic activity of antibiotics using various strains are determined by Agar diffusion method, Minimum inhibitory concentration by broth micro dilution technique and direct bio autographic technique. The results obtained from all the methods demonstrated that antibiotics alone acted as significant antimicrobial agents against different strains like *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli*. The results also elucidated that combination of antibiotics showed significant efficacy in preventing resistance of *different strains* than the antibiotic agents individually.

**Keywords:** Azithromycin, Erythromycin, Salicylic acid, Zone of inhibition, Minimum inhibitory concentration

## Development and Optimization of Cost-Effective New Sources of Culture Media for Probiotic *Lactobacilli*

Sowmya Kasaraneni<sup>1</sup>, Anupama .A. Manne<sup>2</sup>, Kakumanu.BalaVinod<sup>1</sup>, Mitta Keerthana<sup>1</sup>, Gullapalli Revanth<sup>1</sup>, Kanaka Durga Devi.N<sup>\*1</sup>

<sup>1</sup>KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India.

<sup>2</sup>Department of Civil Engineering, PVPSIT, Kanuru, Andhra Pradesh, India.

### Abstract

Probiotics are frequently used in the field of nutrition, and the lactic acid they produce serves as the finest nourishing agent. Large quantities of De Man, Rogosa, and Sharpe agar (MRS) media are needed to produce lactic acid from probiotics, which doubles the expense of production and might have an impact on veganism. A cost-effective new media must therefore be created. In order to create lactic acid by isolated *Lactobacilli* strains from pure sources, a cost-effective growing medium with high nutritional inexpensive ingredients is optimised and improved in this study. This study compares and contrasts various media in order to identify the best carbon and nitrogen sources that will result in the most efficient media for the production of lactic acid. The highest growth was seen when the nitrogen supply was optimised, and it used chickpea powder. Galactose showed the greatest increase in the carbon source optimization. The media that included galactose as a carbon source and chickpea as a nitrogen source produced the most lactic acid. To produce probiotic *lactobacilli* and lactic acid at a reasonable price, low-cost media are made from plant and animal sources.

**Keywords:** *Lactobacilli* strains, De Man, Rogosa, and Sharpe agar, Probiotics, cost-effective

## Therapeutic Vaccination is The Cornerstone of All Cancer Immunotherapy

Devireddy.Samyuktha, Kakani Anil Kumar, Kakumanu.BalaVinod,  
Dondapati.Rajkumar, Sahithi Kamepalli<sup>1</sup>, Jaladi Bhagavan, Kanaka Durga  
Devi.Nelluri<sup>1\*</sup>

KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India.

### Abstract

With a high incidence and fatality rate, cancer is one of the most common deadly diseases. Traditional therapies do not effectively treat malignancies because they cause the release of additional antigens from the tumour cells. Therefore, an unique therapeutic that can efficiently target and eradicate tumour cells while avoiding any side effects is required. Recent research revealed that the identification of tumour neoantigens and the targeting of cancer cells by T cells constitute a shared pathway for an efficient anticancer immune response. Cancer immunotherapy increases the immune system's capacity to indirectly attack and destroy tumour cells while minimising side effects. Not only are tumour-specific mutant antigens crucial targets for checkpoint blockade therapy, but they can also be exploited to create customised cancer-specific vaccines and investigate the underlying molecular principles of various checkpoint blockade therapies. The immunogenic phenotypes of tumours that eventually develop in immunocompetent hosts are shaped by this process, which also eliminates cancers. Additionally, while they are being developed, various nanoparticles with sturdy structural structures that can convey medications to the place of activity while preserving their potency and qualities must be combined. Furthermore, selecting combination therapies can be taken into account so that the shortcomings of one therapy can be remedied by another.

**Keywords:** Antigens, Tumour Cells, Cancer Immunotherapy, Immunocompetent

## Molecular Mechanisms of Innate Immunity

**Poojitha Mokkaapati<sup>1</sup>, Anupama .A. Manne<sup>2</sup>, Devireddy.Samyuktha<sup>1</sup> , Kundurthi Surendra<sup>1</sup> , Shaik Anwar Sadiq<sup>1</sup>,Anisette Sai Manikanta<sup>1</sup>,Kanaka Durga Devi.N\*<sup>1</sup>**

<sup>1</sup>KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India.

<sup>2</sup>Department of Civil Engineering, PVPSIT, Kanuru, Vijayawada, Andhra Pradesh, India.

### Abstract

The innate immune system acts as the first line of defense against foreign and dangerous substances. Briefly, the innate immune system integrates with germline-encoded receptors for immediate responsiveness. Unlike adaptive immunity, innate immune responses do not require genetic recombination events or developmental stages to mediate function. The strategy used for immune recognition is a key feature that distinguishes innate and adaptive immunity. In contrast to the large and randomly generated repertoire of antigen receptors expressed by T and B lymphocytes, the innate immune system consists of a highly conserved group shared by large groups expressed by microbes. However, the innate immune system has evolved to recognize microbial components that are essential for microbial viability and virulence, making it less susceptible to modification and more capable of recognizing the common biological consequences of infection and disease. We deliberately selected two examples (TLR and NLR) where the mechanistic understanding has greatly improved over the past five years and the clinical relevance of these systems is beginning to emerge. Each organ uses a unique set of cells and molecules that regulate local innate immunity. The cells responsible for innate immunity are numerous and consist not only of 'professional' immune cells, but also non-immune cells such as immune cells. Recently discovered cell types, particularly innate lymphocytes and myelosuppressive cells, are receiving increasing attention. Here, we focus on innate immune cells, activation and regulation of innate immunity, and inflammasomes and DNA recognition that may be important for new therapeutic pathways to treat autoimmune diseases and autoinflammation.

**Keywords:** SARS-CoV-2, COVID-19, Antiviral Innate Immunity, Peptides (AMPs).

## Research on the Impact of Food Safety and Labelling

**Vadlamudi Tanvitha<sup>1</sup>, Vemuri Praveen kumar<sup>2</sup>, Anupama .A. Manne<sup>3</sup>, Koduri Prathyusha<sup>1</sup>, VakaKoti Reddy<sup>1</sup>, KallamDhanvanth Reddy<sup>1</sup>, Kanaka Durga Devi. N\*<sup>1</sup>**

<sup>1</sup>KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India.

<sup>2</sup>Department of Biotechnology, Koneru Lakshmaiah University, Vaddeswaram, Andhra Pradesh

<sup>3</sup>Department of Civil Engineering, PVPSIT, Kanuru, Vijayawada, Andhra Pradesh, India.

Email: nellurikvsr22@gmail.com

### Abstract

Food product labeling, as policy tool for ensuring provision of nutrition and health information to consumers and as product differentiation strategy by food companies, has gained importance in the recent past across the globe. Over the past few years there has been a considerable amount of change in the food consumption pattern of the Indian population. Demand for healthy and wellness food is also on rise. With the change in lifestyle and consumption pattern, food safety standards are becoming important from public policy perspective. The outcomes of the study will help to understand the complexity of issues involved in buying process of consumers related to food product labeling and helpful for food companies for designing strategies to maximize benefits from resources spent on food labelling. The study's goal was to ascertain the effect of food safety and labelling awareness levels. The goal of the study was to increase the empirical support for the relationship between brand loyalty and aspects of the product, such as packaging, pricing, and brand awareness. It used a quantitative survey approach and was carried out in malls, schools, and institutions. Data were obtained from a conveniently chosen sample of 1088 customers who bought food products under different brand names. Data was analysed to look into the relationship between packaging and brand recognition. Brand awareness and packaging and labelling had strong positive associations, indicating a strong predictive influence on labelling. The findings imply that brand awareness should be implemented in order to improve consumers.

**Key Words:** Food labelling, Consumer's, Nutrition, Health, Pre-packaged foods



## Optimizing Electric Vehicle Charging and Discharging with Blockchain and Multi-Objective Gray Wolf Algorithm

**L. Ekambaram**

Assistant Professor, Department of Electronics, Andhra Loyola College, Vijayawada.  
Email:l.ekambaram@gmail.com

### Abstract

With the growing number of electric vehicles (EVs) connected to the grid, various challenges have emerged in managing transactions between the EVs and the grid, such as data privacy concerns and system security risks. To address these issues, this paper proposes a blockchain-based solution that ensures secure and private transactions while conserving energy. Specifically, the proposed scheme enables two-way power sales between EVs and the grid, leveraging the security and privacy benefits of blockchain technology. By using this scheme, EVs can interact with the grid in a more secure and energy-efficient way. The objective of this study is to mitigate the negative impact of unregulated charging of a large number of electric vehicles (EVs) on the power grid. To achieve this goal, we aim to optimize the charging and discharging periods of the EVs, with the objective of minimizing the total load on the grid. To tackle this problem, we propose using a heuristic algorithm - an improved version of the multi-objective gray wolf algorithm - which is well-suited for solving complex optimization problems. By applying this algorithm to the charging and discharging model of EVs, we can generate an optimal schedule that minimizes the overall burden on the power grid. In conclusion, our system has been shown to effectively reduce the load fluctuation on the power grid, while also maximizing the benefits of EVs for grid operators. Additionally, qualitative analysis of the security and privacy aspects of our system has demonstrated that it can help to improve the security and privacy of electricity transactions. Overall, the proposed system offers a promising solution for managing the increasing number of EVs on the grid in a secure and energy-efficient manner.

**Keywords:** Electric vehicles, improved multi-objective gray wolf algorithm, institute blockchain, charging/ discharging, optimization.

## Automatic Fire Extinguishing Robot

<sup>1</sup>**B. Anish, K. Eswar Sai Charan, B. Adithya Ranga Sai, YVD Dhanush, T.S. Praneeth Reddy, G. Dhanush, Dr . Nagendra Panini Challa**

Department of SCOPE, VIT University -AP, India

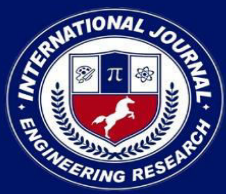
Email: [anishbattu1@gmail.com](mailto:anishbattu1@gmail.com) Abstract:-

### Abstract:

In the future, robots will take the place of people in situations where their lives are in danger. Our goal is to create a fire-suppression and detection robot. By creating and deploying a firefighting robot with an SMS notification. In some dangerous situations like fire accidents we use humans power to stop the fire and save the people in such situations there will be a lot of risk for the human beings even though they take the safety measures in the fire accidents there will be some situations which will be too risky . so our main motto is to use robots as fire fighters in the fire accidents instead of humans beings. In some situations in the house the children use to play with the fire match sticks due to their immature levels they will make it as an fire accidents in the homes or in their play time they bur the papers for the enjoyment purpose as the level of the burning starts though the children are immature they cant stop the fire in such cases it leads to the fire accidents any even the child will fell in the risky situation (or) in home some of the fire accidents will be taken place in the absence of the parents where the child cannot control the fire flames.

For all the problems in above lines there is a solution for it by introducing the fire fighting robot with the SMS alert and call alert. In the situation of the home fire accidents in the absence of the parents to stop the flames by the children he can use the robot by controlling the directions of the robot using mobile phone why because every child is aware of the controlling a toy car and the mobile phone the child can send the robot in the flames place after that the robot will automatically stop when the flame is detected by the flame sensors there by it will automatic starts pouring the water on the flames with control of the servo sg 90. There by the flames gets stopped by pouring the water on the fire flames there by an SMS alert and a call alert will send to their parents. Like this we can stop the fire accidents in the home using firefighting robot and SMS and call alert.

In some situations like building fire accidents we mostly use the man power to stop the flames but there will be an lot of risk even though they take the safety measures there will be a lot of risk like when the building gets fired the walls of the building will be too weak it may even fall on the people in such conditions we loose the fire victims and the people who came for helping they also fell in those risky situations. in such situations we use the robots.



Even in the forest fire accidents also we use the man power to stop the fire in the forest and to protect the forest animals in the forest while protecting the animals and the stopping the fire in the forest both at a time it is not possible because there are some animals in the forest like wild animals which makes the man power to fell in risky conditions in such situations we can use the fire fighting robots.

## Bluetooth Based Home Automation System Using a Microcontroller

**B. Balaji Bhanu<sup>1</sup>, G. Balavamsi<sup>2</sup>, L. Vinaykumar<sup>3</sup>**

<sup>1</sup>Asst. Professor, Dept. of Electronics, Andhra Loyola College, Vijayawada, AP, India

<sup>2,3</sup>UG student, Dept. of Electronics, Andhra Loyola College, Vijayawada, AP, India

Email: [balajibattu@gmail.com](mailto:balajibattu@gmail.com), [aec182934@gmail.com](mailto:aec182934@gmail.com),  
[vinaykumarlachubhuktha0572@gmail.com](mailto:vinaykumarlachubhuktha0572@gmail.com)

### Abstract

Because we live in the 21st century, where automation plays a significant role in nearly every aspect of modern life, When it comes to industrial automation, the idea is applied to huge equipment or robots that aid in boosting productivity, energy efficiency, and time efficiency. Home automation, on the other hand, involves automating the living space. Due to our widespread usage of smart phones and the internet, this is achievable. Home automation can be further divided into two categories: one that only controls appliances from a distance using a smart phone, and another with sensors and actuators that uses a "Smart" system to control lights, temperature, door locks, electronic devices, electrical appliances, etc. The main goal of this project is to create a home automation system that can be remotely managed by any Android OS phone utilising a Microcontroller board with Bluetooth. As technology develops, homes also get smarter. The traditional switches in modern homes are rapidly giving way to centralised control systems with remote-controlled switches. At the moment, traditional wall switches scattered throughout the house make it challenging for the users to operate them all the way by physically making them to operate. But in case of the elderly or disabled people it becomes more difficult to do so. With smartphones, a remote-controlled home automation system offers the most cutting-edge solution. At the transmitter end, a GUI application on the mobile phone transmits ON/OFF orders to the receiver where the Bluetooth module is interfaced to the Microcontroller board at the reception end to achieve this different appliances are related. Through this technique, the loads can be remotely turned on or off by tapping the designated area of the GUI.

**Keywords:** Bluetooth Wireless Technology, Smart phones, Microcontroller Uno, Android Device, home automation.

## Collision Detection and Message Alert System

<sup>1</sup>Dangeti Swetha, <sup>2</sup>Kamana Hari Prasad, <sup>3</sup>BH.L.N.Sanjeev, <sup>4</sup>Bellamkonda Naresh

Electronics & Communication Engineering

SRKR Engineering College, Bhimavaram, India [swethadangeti49@gmail.com](mailto:swethadangeti49@gmail.com)

[hariprasad.kamana@gmail.com](mailto:hariprasad.kamana@gmail.com), [likithsanju17@gmail.com](mailto:likithsanju17@gmail.com),

[Nareshbellamkonda63025@gmail.com](mailto:Nareshbellamkonda63025@gmail.com)

**Abstract**— A significant portion of fatalities from road accidents occur each day worldwide. Reduced response times between the time an accident occurs and the dispatch of initial emergency personnel are two successful strategies for lowering road deaths. As technology and auto manufacturing have evolved, the frequency of traffic accidents has grown. The survival rate after an accident is exceedingly poor since there are inadequate emergency facilities. Our idea would help in identifying an accident and pinpointing its position, which would subsequently be shared with the rescue crew and the rider's emergency contact.

**Keywords**—Arduino uno, impact sensor, ADXL335, GSM

## Aiming for Secure Data Transfer in Mobile Cloud Computing

**Renuka Devi**

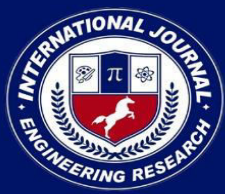
School of computer engineering  
SRM University , Chennai, India 603203  
Email: [renukasri1981@gmail.com](mailto:renukasri1981@gmail.com)

**V. Sai Varshith**

Department of computer Science  
CampbellsVille University, Louisville, Kentucky 42718, USA  
Email: [vsv2797@gmail.com](mailto:vsv2797@gmail.com)

**Abstract:** Despite the fact that electronic have advanced quickly in recent years, PDAs, for instance, telephones, are still weaker than workstations in terms of computational capacity, aggregation, and other factors, and are not equipped to handle the growing demands from clients who use mobile devices. Minimal Appropriate Handling (MCC) significantly increases the cutoff of the beneficial applications by combining flexible figuring with distributed enrolling, but it also adds new challenges to distributed enlisting, such as information security and information uprightness. We outline a guaranteed and advantageous information development structure in MCC in this paper using two or three cryptographic local people, such as another make-based arbiter re-encryption, which provides information security, information respectability, information check, and flexible information scattering with find the opportunity to control. Compared to traditional cloud-based information storage systems, our structure is more lightweight and deployable for mobile clients in MCC because no trusted third parties are connected and each reduced client only needs to store short puzzle keys along with three social event components for each cryptographic development. Finally, we show extensive execution exams and test examinations to highlight the productivity, adaptability, and security of our suggested framework.

**Keywords:** Information uprightness, safe information exchange, mobility of distributed computing, access control, and intermediate re-encryption.



## A Review of Solar Photovoltaic Technologies

**Raghava Sai Prudhvi Kavipurapu**

Masters in Engineering Management

University of Leicester, Leicester, United Kingdom

Email: [raghavakavipurapu@gmail.com](mailto:raghavakavipurapu@gmail.com)

### **Abstract**

New prospects for the use of renewable energy sources are emerging as a result of growing energy demand, global environmental concerns, and continual advancements in renewable energy technologies. The most abundant, limitless, and cleanest source of renewable energy available today is solar energy. One of the best methods for using solar power is photovoltaic technology. This essay examines photovoltaic technology, as well as its ability to generate power, various light-absorbing materials now in use, environmental impact, and range of applications. Sizing, control, and the many models for evaluating performance and dependability that are now in use have also been explored.

**Keywords**—Solar energy; Photovoltaic technologies; Various types; Absorbing materials; Comparison; Applications.

## Customizing Home Appliances Using IoT

<sup>1</sup>Maineni Sai Tejaswini, <sup>2</sup>A. Kantha Rao

<sup>1</sup>UG student of Dept. of Electronics, Andhra Loyola College, Vijayawada, India

<sup>2</sup>Asst. Professor, Dept. of Electronics, Andhra Loyola College, Vijayawada, India

Email: [mainenisaitejaswini@gmail.com](mailto:mainenisaitejaswini@gmail.com)

### Abstract

Electricity became a part of modern life and one cannot think of a world without it. Electricity has many uses in our day-to-day life. It is used for lighting rooms, working fans and domestic appliances like using electric stoves, A/C and more. All these provide comfort to people. In factories, large machines are worked with the help of electricity. Essential items like food, cloth, paper and many other things are the product of electricity. The Bluetooth wireless technology is set to revolutionize the way people perceive digital devices in our homes and office environment. Now they are no longer just the individual devices; instead, with the embedded Bluetooth technology, they form a network in which appliances can communicate with each other. Today we are living in 21st century where automation is playing important role in human life. Home automation allows us to control household appliances like light, door, fan, AC etc. It also provides home security and emergency system to be activated. Home automation not only refers to reduce human efforts but also energy efficiency and time saving. In one's home helps to promote security, comfort, energy efficiency, and convenience. Another benefit of home automation systems is the amount of labour, time, energy and materials that is saved. The main objective of home automation and security is to help handicapped and old aged people which will enable them to control home appliances and alert them in critical situations. The automation of features Integrating a home with internet is a trending technology going on in today's world. Before we used switches to control the gadgets in our homes, but now in this IoT a mobile application is used to control the gadgets in home like fans, AC, fridge, CCTVs, lights, etc.... This is what which makes it attractive to people. This study aims on the use of IoT in smart homes.

**Key Words:** Internet of Things, Smart homes, Technology, Home appliances.



## Design and Implementation of FPGA Based Smart Embedded Vision System for Biomedical Applications

1<sup>st</sup>Y.Amar Babu, 2<sup>nd</sup> S.V.K.Pratap Reddy, 3<sup>rd</sup> N.Banbhushan,  
4<sup>th</sup> P.Venkatesh, 5<sup>th</sup> K.Tirumala Krishna

Electronics and Communication Engineering, LBRCE COLLEGE, MYLAVARAM

### Abstract

In today's smart world, applications in sectors like robotics, intelligent systems, and cars must have embedded vision with the best design metrics. A tiny vision system can be designed for the particular application using a miniature PC and camera; this type of system is known as an embedded vision system. This project suggests creating an embedded vision system and implementing it for real-time applications for improved design metrics. Low cost, quick development, small area, and fast speed are optimized design metrics. The ZYNQ SOC is used to implement the suggested embedded vision system. In order to deliver high flexibility, high performance, scalability and low power, the ZYNQ SOC integrates the hardware programmability of an FPGA with the software programmability of a processor into a single device. By connecting the OV7670 camera to the zedboard, the embedded vision system was put into practise. The client-server design of the Zedboard allows for real-time data streaming to the PC through Ethernet. The hardware platform for the proposed embedded vision system designing with VHDL built-in IP cores in Vivado, C-language application software create in SDK, and Petalinuxon Ubuntu is the framework required for applications based on embedded vision systems. The proposed smart embedded vision system is used for bio medical applications.

Index Terms—SOC, Embedded vision system, Ethernet, OV7670 camera module.

## Carinae's Heart Disease (CHD): A Pragmatic Perspective

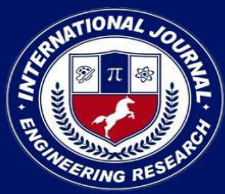
**Manoj Bollavarapu**

Masters in Computer Science Engineering  
Wright State University  
Dayton, Ohio, Unites States of America  
Email: bollavarapu.2@wright.edu

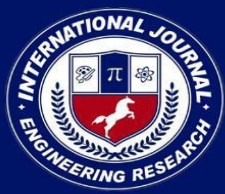
### **Abstract:**

Coronary Heart Disease (CHD) is one of the leading causes of death globally. The disorder causes the blood arteries that supply the heart muscle with oxygen and nutrients to constrict and clogged with fatty deposits. CHD can lead to chest pain, heart attacks, and even death. Preventing CHD requires a combination of lifestyle changes, such as regular exercise, a good diet, giving up smoking, and stress management. Medications, such as cholesterol-lowering drugs, may also be prescribed. In severe cases, surgical procedures such as angioplasty or coronary artery bypass surgery may be required. There are many ongoing research projects aimed at improving our understanding of CHD and finding new treatments. One area of research focuses on determining and treating the underlying environmental and genetic variables that influence development of CHD. Other projects are exploring the use of new imaging techniques, such as CT scans, to more accurately diagnose and monitor the progression of CHD. Another area of focus is developing new drugs and therapies to improve the outcomes for patients with CHD. This may involve targeting specific risk factors include things like high blood pressure or cholesterol levels or developing new medications to improve blood flow to the heart muscle. Overall, the goal of CHD research is to reduce the number of people affected by this disease and to improve the quality of life for those who are diagnosed. By continuing to invest in CHD research, we can better understand this complex condition and find new ways to prevent and treat it. Classifying whether a person has coronary heart disease (CHD) is a common task in medical diagnosis, and several algorithms for machine learning can be used to perform this task. The straightforward, non-parametric algorithm K-Nearest Neighbors (KNN) which classifies an instance of the training set's  $k$  nearest neighbours. It can be used for CHD classification by considering various medical features of a patient, such as age, gender, blood pressure, and cholesterol levels, as the input features.

Decision trees are a popular algorithm for classification and decision-making tasks. In a decision tree, the input features are used to make a series of binary decisions that lead to the prediction of CHD or not. A decision tree can be converted into a decision forest by using an ensemble of decision trees and averaging their predictions, which is called Random Forest. Random Forest has been shown to perform well in various medical diagnosis tasks, including CHD classification.



In conclusion, both KNN and Random Forest can be used to classify CHD in patients, and the choice between them depends on the complexity of the problem, the number of training sets, their size, and the computational resources available. Both algorithms have the potential to achieve high accuracy in CHD classification, but more research is needed to evaluate their performance in a specific medical setting.



## Cardiac Health Monitoring System

<sup>1</sup>Halaa Pranavi Vangara, <sup>2</sup> Dr. Sunny Chung

<sup>1</sup>Student of MS, Dept. of CIS, CLEVELAND STATE UNIVERSITY, USA

<sup>2</sup>Associate Professor, Dept of CIS, CLEVELAND STATE UNIVERSITY, USA.

Email: [vhp2398@gmail.com](mailto:vhp2398@gmail.com)

### Abstract

When we hear about cardiac health heart rate and blood pressure comes up a lot. Both the heart rate and blood pressure indicate how well our heart is working and can signal potential cardiac problems. Heart related diseases are increasing day by day, and there are some situations where there is no doctor or clinic nearby for example in rural areas and the patients do not recognize their condition. In this project we implement heart rate measurement from the fingertip using Arduino uno microcontroller. The values from the microcontroller board will be saved in an excel sheet and in the database which are then sent to the doctor. The doctor checks the values online and sends them any medical advice and updates the user using a electronic mail.

## Automated Waste Management System

**Dr.K.Rama<sup>1</sup>,**

Loyola Academy, ramakovur@gmail.com

**K.Raajasekhar<sup>2</sup>,**

Osmania University, raajasekhar952@gmail.com

### **Abstract**

In the current scenario, the major problem faced by almost all the municipalities is, the management of garbage. With the increase in the population, there is an increase in the garbage around urban areas. It is very important to focus on this issue as it leads to many environmental problems and spread diseases. Conventional dustbins open when the lever is pressed and the garbage is thrown into it and needs a person to keep track, whether the bin is full or not, so that it can be emptied without overflowing. Here in this smart waste management, the proposed smart bin works all by itself. It operates automatically using IoT and sensor-based circuitry, the sensor used will detect the human object signal and the bin opens and closes its hatch automatically without any need to press its lever.

It also consists of a level sensing ultra sonic sensor that constantly measures the level of garbage in the bin and informs the same using IoT to the concerned person when it is about to fill up. The circuit that is present with the bin will transmit the information to the garbage collector to empty the garbage bin. IoT Gecko development platform is used to develop the online web transmission for the system. The Data collected through IoT gecko is analyzed and message can be sent to the concerned person to empty the bin. .IoT Gecko is deployed in the smart dustbins for a wider geographical area with a minimum amount of man power. Smart Dust bins can help to take decisions on which dust bin is filling fast and which is not used frequently. This work is of great use in municipalities, offices and at home for garbage management as it is used for garbage cleaning automatically. The proposed model completes the required tasks in managing the waste and fulfils the idea of Swatch Bharat mission.

### **Keywords:**

Smart waste management, sensor-based circuit, automated, Swatch Bharat mission, IoT.

## A Study on Emerging Approaches for Cyber Physical System Security

<sup>1</sup>**Soumya k**

Asst. professor, School of CS & IT, Jain deemed to be university

[Soumya.k@jainuniversity.ac.in](mailto:Soumya.k@jainuniversity.ac.in)

<sup>2</sup>**P Joseph Charles**

Head, Dept. of Information Technology

St. Joseph's College (autonomous)

[hedrpjcharles@gmail.com](mailto:hedrpjcharles@gmail.com)

### Abstract

Cyber Physical Systems (CPS) are becoming increasingly prevalent in modern society, but their security remains a major concern. The integration of physical and cyber systems makes CPS vulnerable to a range of security threats, from cyber attacks to hardware failures. While there are current solutions for CPS security, they have limitations and are not always effective in preventing security breaches. To address these limitations, new approaches to CPS security are emerging, including Artificial Intelligence and Machine Learning (AI/ML), Block chain, and Edge Computing. This paper provides an overview of these emerging approaches and their advantages and limitations, as well as case studies and real-world applications. The paper also compares the benefits and limitations of each approach and concludes with implications for future research and the importance of CPS security in modern society.

**Keywords**— Cyber Physical System, cyber attacks, cyber threats, vulnerabilities.

## Centella Asiatica: Phytochemical extraction with bio Solvents and Phytochemical Screening

S. Vani Latha<sup>1</sup>, G.Little Flower<sup>2</sup>

<sup>1</sup> Head, Department of Chemistry, Maris Stella College, Vijayawada, Andhra Pradesh, India.

<sup>2</sup> Head, Department of Physics, Maris Stella College, Vijayawada, Andhra Pradesh, India.

### Abstract

Medicinal plants are the conventional sources of phyto therapeutic substances that are used to treat various diseases since pre-historic times. Centella asiatica is one of the ancient therapeutic herbs known for its traditional use worldwide. The presence of phytochemicals imparts the pharmacological value to the medicinal plants and hence their extraction is significantly important. Many of the works include extraction of phytochemicals by hazardous VOCs. The present work explored the phytochemical extracting ability of three bio solvents ethyl lactate, ethanol and hydroalcohol from Centella asiatica. Qualitative phytochemical screening of these extracts was carried out and summarized.

## Speed of Sound Studies of Ethyl-4-hydroxy Benzoate with Formamide at Different Temperatures

Dr A. Nagarjuna<sup>1\*</sup>, Dr K.V.S. N Raju<sup>2</sup>, Dr Shaik. S Begum<sup>3</sup>, Dr B.M Praveen<sup>4</sup>

<sup>1,2</sup> PDF Scholar, Department of Physics, Srinivas University, Mangalore, Karnataka-574146, India

<sup>3</sup>Assistant Professor, Department of Physics, Krishna University, Machilipatnam, Andhra Pradesh, India

<sup>4</sup>Director, Research and Innovation Council, Srinivas University, Mangalore, Karnataka-574146, India

**Corresponding author:** [dranagarjunaphysics@tkrec.ac.in](mailto:dranagarjunaphysics@tkrec.ac.in)

**Abstract:** Record the measured values of densities ( $\rho$ ) and speed of sounds ( $U$ ) for the mixture of Ethyl-4-hydroxy benzoate(E-4HB) with formamide (FA) from temperature 303.15, 308.15 and 313.15K. Several speed of sound theories like nomoto relation, ideal mixing relation, impedance relation, vangeel and vandael relation, rao's specific velocity relation and junjie relation have been determine and collate to measured values. By apply the chi-square test ( $\chi$ ) and average percentage error (APE) use to check validity of these theories. The upshots are discussing in-terms of in-tera molecule attractions betwixt the particles in two-fold mix.

### Keywords:

Ethyl-4-hydroxy benzoate, chi-square test, average percentage error, two-fold mix



## Frequency Regulation in Deregulated Power System Using Robust Firefly Swarm Hybrid Optimization

**Durga Bhavani Sudani , Venkatesh P, Vimala Devarapalli, Sindhura Balasubramanyam, Srilakshmi Koritala, Chinmai Anumolu**

Electrical and Electronics Engineering, VR Siddhartha Engineering College  
Vijayawada, India, [sudanidurgabhavani@outlook.com](mailto:sudanidurgabhavani@outlook.com), [venki249@gmail.com](mailto:venki249@gmail.com),  
[devarapallivimala678@gmail.com](mailto:devarapallivimala678@gmail.com), [sindhupalaji1512@gmail.com](mailto:sindhupalaji1512@gmail.com), [srilu.koritala@gmail.com](mailto:srilu.koritala@gmail.com) ,  
[chikkianumolu9@gmail.com](mailto:chikkianumolu9@gmail.com)

### **Abstract:**

Frequency control is more delicate to the load variations in power system. So, it needs proper matching of generation and load demand. This work presents a hybridization of two optimization methods, combination of Particle Swarm Optimization (PSO) and Firefly algorithm (FA). In Automatic Generation Control (AGC), Proportional Integral Derivative (PID) controller is tuned by Hybridization of Particle Swarm Optimization with Firefly (HPSOFA). The proposed algorithm is tested for AGC of Two area multiunit power system include of both Solar and Wind. Area 1 and Area 2 contains of three non-reheat turbines and three reheat turbines respectively, along with solar thermal unit and Doubly Fed Induction Generator (DFIG). These two areas are interconnected by tie line. To validate the usefulness of PID controller, Integral of the Time Weighted Absolute Error (ITAE) performance index is considered and 1% step load variation is applied in area1 and Unilateral, Bilateral and Contract Violation are the three different cases observed for proposed deregulated power system. The resultant power system is exhibited in MATLAB/SIMULINK environment.

**Keywords** — Automatic Generation Control, Doubly Fed Induction Generator, Firefly Algorithm, Hybridization, load Frequency Control, Particle Swarm Optimization, Proportional Integral Derivative.

## Optical Properties of $\text{Ce}^{3+}$ Doped $\text{Gd}_2\text{SiO}_5$ Phosphors Prepared By SSR Method

**Ch. Atchyutha Rao\***, **SK.Akram<sup>1</sup>**, **N. Bujji Babu<sup>2</sup>**, **K.V.R. Murthy<sup>3</sup>**

\*Department of Physics, GDC-Nakkapalli-531081, ANAKAPALLE (DT), A.P, India

<sup>1</sup>Department of Physics, GDC-Mummidivaram-533216, Dr.B.R Ambedkar Konaseema (DT), A.P, India

<sup>2</sup>Department of Chemistry, PR GDC (A), Kakinada- 533001, A.P, India

<sup>3</sup>Display Materials Laboratory, Applied Physics Department, Faculty of Technology and Engineering,

M. S. University of Baroda, Vadodara-390001, India

\* Corresponding author Tel: +919949522835, e-mail: [atchyyuth@gmail.com](mailto:atchyyuth@gmail.com)

### Abstract

The present paper reports the optical properties of rare-earth-doped Gadolinium Silicate Phosphors. The Cerium Oxide ( $\text{Ce}^{3+}$ ) was used as rare-earth-doped. The phosphor is prepared by using the Solid-state reaction method (conventional method) heated at  $1200^\circ\text{C}$  for 2 hrs. The received cakes are grounded for 30 minutes each. The phosphors are prepared and the received powder is subjected to PL, XRD, SEM, and EDAX analysis. The following section discusses and the experimental results are mentioned in these phosphors. The present Phosphor can act as a host for blue light emission in many display devices and technological applications.

**Keywords:** Gadolinium Silicates Phosphor, Rare earth ion, Conventional Solid state reaction method.

## Lexicon and Machine Learning Based Comparative Analysis to Classify the Students Opinions on Covid-19 Pandemic

**Dr.A. Angelpreethi**

Assistant Professor, Department of Computer Science, St. Joseph's College, Tiruchirappalli, TN, India

### **Abstract:**

Everything is online in this digital world. People express their feelings in the form of reviews on social media sites such as Twitter, Facebook, LinkedIn, and YouTube. With the use of the Internet, the voices of users are increasing day by day. Opinion mining or sentiment analysis plays an important role in classifying opinions according to user perceptions. During the pandemic (COVID-19), everything has gone digital, especially with most students suffering from it. The purpose of this study was to examine student feedback for online education systems using lexicon and machine learning based approach. The proposed Senti\_Lexi and Senti\_Mac approaches classify the student's opinion into positive, negative and neutral based on the polarity value. This research work is used for the educators to understand and classify the student attitudes towards online education.

**Key Words:** Sentiment Analysis, Opinion Mining, Education, Twitter.

## Automatic Speech Recognition Using Deep Learning Techniques

<sup>1</sup>G.Tirumala

Research Scholar

Department of Computer Science, Vikrama Simhapuri University College, Nellore.  
tirumala.gb@gmail.com

<sup>2</sup>Dr. Ande Prasad

Professor

Department of Computer Science, Vikrama Simhapuri University College, Nellore  
drandepasad@vsu.ac.in

### Abstract

Due to its intricacy, automatic speech recognition is one of the most difficult tasks in Machine Learning. Deep learning techniques have recently been used for this problem and have been shown to perform better than conventional machine learning techniques like Artificial Neural Networks (ANN). Since normal feed forward neural networks cannot store prior information, they are not appropriate for speech data. In particular, Automatic Speech Recognition (ASR) performance has been enhanced using Deep Learning (DL) techniques like Long Short Term Memory (LSTM) and three separate recurrent networks. The effectiveness of a Standard RNN, LSTM, and Gated recurrent unit (GRU) network on voice data is compared in this study. The suggested model modifies the standard LSTM network design to effectively utilize the model parameters. A few sequential and CNN-based models were applied to the same dataset and compared to the proposed model. With an accuracy of more than 90% on the well-known public benchmark spoken English digit dataset, LSTM-RNN outperformed the other DL models. According to the examination of the trials, LSTM outperformed all other networks in terms of word error rate.

### Index Terms

Automatic Speech Recognition, Artificial Neural Networks, Deep Learning, Deep Neural Network, Convolutional Neural Network, LSTM, Machine Learning, Recurrent Neural Network.

## Hazardous Gases Detection and Alerting System in Underground Coal Mines

**Satya Saketh Kumar. G**

Student, Dept. of EIE , VR Siddhartha Engg. College, Vijayawada, India  
[sakethkumar963@gmail.com](mailto:sakethkumar963@gmail.com)

**Jalalu. G**

Asst. Prof, Dept. of EIE , VR Siddhartha Engg. College, Vijayawada, India  
[Jallu.sk@vrsiddhartha.ac.in](mailto:Jallu.sk@vrsiddhartha.ac.in)

**Sai Siva Rama Krishna. P**

Student, Dept. of EIE, VR Siddhartha Engg. College, Vijayawada, India  
[ssrkperumalla147@gmail.com](mailto:ssrkperumalla147@gmail.com)

**Satya Chandra Shekar. A**

Student, Dept. of EIE, VR Siddhartha Engg. College, Vijayawada, India  
[ascshekar1999@gmail.com](mailto:ascshekar1999@gmail.com)

### Abstract

For most emerging nations to meet their energy needs, coal mining is crucial. Mining is a dangerous activity, and underground mining poses an exponentially greater risk. Compared to the surface or open-pit mining, underground coal mining has significantly riskier working conditions. Some toxic and hazardous gases are released by the extraction of coal. Hazardous gases that are present in significant quantities can have physiological consequences on the person's body and potentially result in death. Timely Detection of these hazardous gases like carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), and dangerous flammable gas like methane (CH<sub>4</sub>), or in other words firedamp, is a significant problem that must be met to ensure the safety of the mine's workers. In this study, we suggest developing a gas-detection sensor and microcontroller system for mine gas detection. For the detection of methane & carbon Monoxide, MQ-4 and MQ-7 will be used. MQ-135 will be used to detect the smoke. DHT11 sensor is used for the measurement of temperature & humidity. These sensors will be wired into an Arduino board, which will then be wired into an LCD that will display the values on a regular basis. The proposed system detects hazardous gas and provides safety against fire explosions, and poisoned gases like CO, CO<sub>2</sub>, and CH<sub>4</sub> and alerts people in the tunnel.

Keywords— Toxic gases, Fire damp, Arduino board, Miner's safety, Sensors.

## Recent Advances and Future Directions in Artificial Intelligence with Pattern Recognition

**<sup>1</sup>P. Nagabhushanam**

Research Scholar

Department of Computer Science, Vikrama Simhapuri University College, Nellore.  
[nagabhushan.pendlimari@gmail.com](mailto:nagabhushan.pendlimari@gmail.com)

**<sup>2</sup>Dr. Ande Prasad**

Professor

Department of Computer Science, Vikrama Simhapuri University College, Nellore  
[andeprasadvsu@gmail.com](mailto:andeprasadvsu@gmail.com)

### Abstract

"A rapidly expanding topic, artificial intelligence using pattern recognition has made considerable strides in recent years. Numerous applications exist in numerous fields, including speech recognition, image processing, and natural language processing, where the capacity of AI systems to identify patterns in data is useful. This research paper explores the latest developments in AI with Pattern Recognition and its applications in various domains. It provides a comprehensive overview of the various techniques used for pattern recognition and their effectiveness. The paper also discusses the challenges faced by the AI community in developing effective pattern recognition systems. The conclusion presents some of the future directions for research in AI with Pattern Recognition, including the need for increased accuracy, scalability, and interpretability of these systems. The paper provides valuable insights for researchers and practitioners in the field of Artificial Intelligence.

**Keywords :** Artificial Intelligence (AI), Natural Language Processing (NLP), Pattern Recognition (PR), Speech Recognition

## Basic Functionalities of Quantum Computing

**B. Balaji Bhanu**

Asst. Professor, Dept. of Electronics, Andhra Loyola College, Vijayawada, AP, India  
[balajibattu@gmail.com](mailto:balajibattu@gmail.com)

### **Abstract**

With a wide range of potential uses and ramifications for businesses and markets, quantum computing has the potential to be the next disruptive technology. Superposition and entanglement are two aspects of quantum physics that quantum computers use to encode data and conduct operations on it. Quantum computers are able to answer very precise, difficult problems much more quickly than conventional computers thanks to both of these principles. The hardware, system software, and application layers of a quantum computer are briefly described in this fundamental against this background. We also discuss prospective applications for quantum computing as well as future lines of inquiry for the study of information systems.

**Keywords** Quantum computing, Quantum physics, Cloud computing, Emerging technology, Information systems

## Exploring the Antimicrobial Properties of Silver Nanoparticles against Various Bacterial Strains

**G.Little Flower<sup>1a\*</sup>, S.Vani Latha<sup>1b</sup>, G.Sahaya Baskaran<sup>1c</sup>, N.Jayarambabu<sup>2a</sup>, K.Venkateswara Rao<sup>2b</sup>**

<sup>1a\*</sup>Department of Physics, Maris Stella College, Vijayawada, A.P, India

<sup>1b</sup>Department of Chemistry, Maris Stella College, Vijayawada, A.P, India

<sup>1c</sup>Department of Physics, Andhra Loyola College, Vijayawada, A.P, India

<sup>2a</sup> Department of Physics, NIT, Warangal, A.P, India

<sup>2b</sup> Centre for Nano Science and Technology, IST, JNTU Hyderabad, Telangana, India

**\*Corresponding author:** [gflower1@gmail.com](mailto:gflower1@gmail.com);

### Abstract

The advancement in the field of nanobiotechnology and nanomedicine in recent years has opened up new avenues for exploring the antibacterial and antifungal properties of metal nanoparticles, including Silver nanoparticles (Silver NPs). Silver NPs have gained popularity due to their broad range of biological applications, such as antibacterial, antifungal, antiviral, and anti-inflammatory properties, making them suitable for biomedical applications, particularly in wound care. This study presents the synthesis and characterization of Silver NPs using both green and chemical methods. The antibacterial efficacy of the synthesized Silver NPs was evaluated against Gram-negative bacteria (*Klebsiella pneumonia*, *Escherichia coli*) and Gram-positive bacteria (*Staphylococcus aureus*) using the disk diffusion method.

**Keywords:** Silver nanoparticles; antibacterial studies; Gram-positive; Gram-negative; disk diffusion method;



## Data Reduction Based Truth Discovery Analysis by Resolving the Conflicts in Big Data using Continuous Data

Dr. P. Bastin Thiyagaraj<sup>1</sup>, Dr. A. Aloysius<sup>2</sup>

<sup>1</sup>Department of Information Technology, St. Joseph's College (Autonomous), Affiliated to Bharathidasan University, Trichy – 620002, TamilNadu, India.

[bastinstar@gmail.com](mailto:bastinstar@gmail.com)

<sup>2</sup>Department of Computer Science, St. Joseph's College (Autonomous), Affiliated to Bharathidasan University, Trichy – 620002, TamilNadu, India.

[aloysius1972@gmail.com](mailto:aloysius1972@gmail.com)

### Abstract

Data are normally generated from various sources and valuable insight for business success. Though, it is complex to process and analyse the data to derive valuable information to strengthen business strategy, performance and efficiency. Big Data provides solutions for companies to make sense of random information. Big data is a term given to describe the volume of data (petabytes (1,024 terabytes) generated from websites, portal, and online applications), unstructured (include emails, voicemails, hand-written text, ECG reading, audio recordings), and complex in processing (from Medical data, Business transactions, Data capture by sensors, Social media/networks, Banking, Marketing, Government data, etc.). The problem is to analyse the data collected from the heterogeneity of sources to identify the truth from the conflicting information. But it is difficult to retrieve the true information when conflicted data consists of the outliers and it affects the performance of truth discovery. The main purpose of this paper is to remove the outlier to enhance the performance and identify the true information from the conflicting data. Since a reliable source can be identified by computing the source weight by removing the outliers.

**Keywords:** Big data analytics, Loss distance, Source Reliability, Mean Absolute Error.

## Exploring Robust Emotion Specific Features for Automatic Text-Independent Emotion Recognition for Telugu Language

**U. Kumara Swamy**

Research Scholar

Department of Computer Science, Vikrama Simhapuri University College, Nellore.  
[uppara.kumar@gmail.com](mailto:uppara.kumar@gmail.com)

**Dr. Ande Prasad**

Professor

Department of Computer Science, Vikrama Simhapuri University, Nellore  
[drandeprasad@vsu.ac.in](mailto:drandeprasad@vsu.ac.in)

### Abstract

Humans communicate through speech. In general human speech consists two types of messages. The first one is related to linguistics (Explicit Message). The second one consists of information related to speaker, emotion and gender (Implicit Message). Factors like physiology influences speaker and gender information. Whereas Linguistic information is not influenced by the emotional states and the speech production mechanism Speaker's information is reflected in quality of voice information; basic sound information along with emotional information is reflected in spectral features. The performance of the system is degraded due to the mix of similar emotional parameters.

Speech components like spectral information and prosody information are the resultant of speech generation mechanism. The main challenge lies in exploring robust emotion specific features. Few important conclusions inferred from this work are: Spectral features are able to capture the emotion specific information effectively.

### Keywords:

1. Deep learning
2. SVM-PCA
3. GMM-PCA
4. UBM-GMM

## Smart Solar Grass Cutter with Lawn Coverage

<sup>1</sup>K. Bindu Amrithanandamai , <sup>2</sup>K. Praveen Kumar , <sup>3</sup>K. Nanda Prasad, <sup>4</sup>L. Ganesh

Electronics&Communication Engineering

SRKR Engineering College Bhimavaram,India

[amrithanandamai.1899@gmail.com](mailto:amrithanandamai.1899@gmail.com) , [praveenkumarkatamala7@gmail.com](mailto:praveenkumarkatamala7@gmail.com)

[nandaknp580@gmail.com](mailto:nandaknp580@gmail.com), [lankag025@gmail.com](mailto:lankag025@gmail.com)

**Abstract:** Currently, it is normal practice to cut grass over fields using a manually operated instrument, which results in pollution and energy loss. Cutting grass in lawns will take less effort with a solar-powered robotic solar grass cutter which is accessible from all angles via a smartphone app. It is made of an Arduino ATmega328p microprocessor, an ultrasonic sensor, a solar panel, and dc motors. This gadget uses a solar-based energy source, which is more practical and advantageous. Our invention comprises of a linear blade that is driven by a motor, and the power supply for the motor is provided by a rechargeable battery. This device will be crucial in the globaleconomy in the future.

**Key words:** Arduino UNO, DC Motor, Node MCU, Linear Blade, solar Panel.

## Ambulance Clearance Smart IoT System

**D. Srinivasa Reddy<sup>1</sup>, J.P. Kanti<sup>2</sup>, G.Jyothsna<sup>3</sup>, MD. Imdaad<sup>4</sup>**

Asst. Professor, Dept. of Electronics, P.B. Siddhartha College of Arts & Science, Vijayawada<sup>1</sup>

H.O.D, Dept. of Electronics, Sri Durga Malleswara Siddhartha Mahila Kalasala, Vijayawada<sup>2</sup>

Lecturer, Dept. of Electronics, Sri Durga Malleswara Siddhartha Mahila Kalasala,  
Vijayawada<sup>3</sup>

U.G, Student, Dept. of Electronics, P.B. Siddhartha College of Arts & Science, Vijayawada<sup>4</sup>

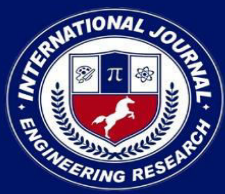
**Email:** dsrinivasareddy@pbsiddhartha.ac.in

### Abstract

The obtainable time based traffic management system is not suitable and friendly for the present day traffic. Due to this many emergency service vehicles like fire service; ambulance was prevented from doing their services on time. The increase in Vehicle population demands a major change in the current Traffic management systems. There are some systems which uses image processing technology for efficient traffic management in urban areas. But these technologies are usable only in developing countries as they are more complex and expensive. This project addresses the given problem statement by automating the traffic signal control from the ambulance's driver end. The ambulance driver will have a mobile app installed in his mobile which will have the emergency mode toggle. When the emergency mode is on, the device will find the nearest traffic signal using GPS and it will send request to the control room for getting the current signal status. If the signal is already green, it will get the remaining time and based on the remaining time, the app will automatically control the signal and freezing the signal till the ambulance crosses with the help of Blynk. And if the signal is red, again based on the time left, the system will calculate the distance of ambulance from the signal and then it will send the data to Blynk for opening that particular route where the ambulance is running. This will help the ambulance drivers to run freely without getting locked in the traffic. Due to Lack of traffic control leads to loss of lives due to ambulances getting stuck in traffic jams. To overcome this situation, we propose Global Position based Automatic Lane Clearance System. The function of this is to reduce the delay in arrival of the ambulance to the hospital by automatically clearing the lane in which ambulance is travelling, before it reaches the traffic signals. This can be possible by turning the traffic signal, in the path of the ambulance, to green when the ambulance is at a certain distance from the traffic junction. The communication gap among the traffic signal and the ambulance is done through transceivers and GPS. The system is fully automated and not requires any human intervention at the traffic junctions.

### Keywords:

Internet of Things (IoT); ESP32; NodeMCU; Traffic Lights; Global Positioning System;



## 5G – An Eventual Communication with Li-Fi and Wi-Fi

**Naga Jayanth Chennupati**

MEng Electrical and Computer Engineering University of Waterloo  
Waterloo, Canada [njchennu@uwaterloo.ca](mailto:njchennu@uwaterloo.ca)

### **Abstract**

In this paper first irradiated the generations and its features in Mobile Communication. Introduction describes 5G and its requirements, use cases. The subsequent section describes the technologies (Wi-Fi and Li-Fi) involved which are needed in 5G. As a final point the paper discussed the challenges, opportunities and applications of 5G can expose in future.

## Molecular Interaction and Thermodynamic Parameters in Certain Binary Liquid Mixtures with Variation of Temperature

**K.L.V.Nagasree, Prof.K.Samatha,**  
Department of Physics, Andhra University  
[nagasreekarri@gmail.com](mailto:nagasreekarri@gmail.com)

### Abstract

The study of molecular interactions and the variations in these interactions due to structural changes has been carried out by numerous experimental techniques such as Infrared, Nuclear Magnetic Resonance and Raman Spectra and Dielectric property measurement. The three binary mixtures chosen for the investigation of molecular interactions are 1,2 Dichloroethane as a basic solvent which was mixed with cresols such as o-cresol, m-cresol and p-cresol. Ultrasonic sound velocity ( $u$ ), density ( $\rho$ ) and viscosity ( $\eta$ ) were measured experimentally at four different temperatures namely 303k, 308k, 313k, 318k and at different compositions of 1,2-dichloroethane. The physical properties such as molar volume, adiabatic compressibility, mean free length, acoustic impedance, Rao's constant and free volume are calculated using these experimental values. The results obtained are utilised to analyse the interactions between the component molecules.

**Key Words:** Binary Mixtures, adiabatic compressibility, impedance, density, viscosity

## Ghost Imaging Face Recognition Protocol using Quantum Mechanisms

<sup>1</sup>Dr. K. Jyothi.

Department of Physics,  
SVRK Govt. Degree College, Nidadavole, Andhra Pradesh, India  
jyothirmphy@gmail.com

<sup>2</sup>J. Panduranga Rao

Lecturer in Physics,  
P. B. Siddhartha College of Arts and Science , Vijayawada, India  
jpandu09@gmail.com

### Abstract:

Face recognition is one of the most ubiquitous examples of pattern recognition in machine learning, with numerous applications in security, access control, and law enforcement, among many others. Pattern recognition with classical algorithms requires significant computational resources, especially when dealing with high-resolution images in an extensive database. Quantum algorithms have been shown to improve the efficiency and speed of many computational tasks, and as such, they could also potentially improve the complexity of the face recognition process. Here, we propose a quantum machine learning algorithm for pattern recognition based on quantum principal component analysis, and quantum independent component analysis. A novel quantum algorithm for finding dissimilarity in the faces based on the computation of trace and determinant of a matrix (image) is also proposed. The overall complexity of our pattern recognition algorithm is  $O(N \log N)$ — $N$  is the image dimension. As an input to these pattern recognition algorithms, we consider experimental images obtained from quantum imaging techniques with correlated photons, e.g. “interaction-free” imaging or “ghost” imaging. Interfacing these imaging techniques with our quantum pattern recognition processor provides input images that possess a better signal-to-noise ratio, lower exposures, and higher resolution, thus speeding up the machine learning process further. Our fully quantum pattern recognition system with quantum algorithm and quantum inputs promises a much-improved image acquisition and identification system with potential applications extending beyond face recognition, e.g., in medical imaging for diagnosing sensitive tissues or biology for protein identification.

## The Generated AUNU [ 7 4 ]- The Kown Linear Code [7 4 3 ] Using Hamming Code Method (U|U+V)

**M.J.Subhakar**

HOD of Mathematics, Noble College, Machilipatnam  
[mjsubhakar@gmail.com](mailto:mjsubhakar@gmail.com)

### Abstract

In this communication, we enumerate the construction of a [7 4 2]- linear code which is an extended code of the [ 6 4 1 ] code and is in one-one correspondence with the known [7 4 3 ] - Hamming code. Our construction is due to the Carley table for  $n=7$  of the generated points of was permutations of the (132) and (123)-avoiding patterns of the non-associative AUNU schemes. Next, [ 7 4 2 ] linear code so constructed is combined with the known Hamming [ 7 4 3 ] code using the ( u|u+v)-construction to obtain a new hybrid and more practical single [14 8 3 ] error- correcting code.

**Keywords:** Cayley tables; AUNU scheme; Hamming codes; Standard generator matrix; Extended code ; Reduced Row Echelon form (RREF); [n k d] linear code; (u|u+v) construction; Parity check matrix



## A Chaotic Map and Elliptic Curve-Based Encryption Scheme for Enhanced Security in IoT Health Information System"

<sup>1</sup>J.Praveen Kumar, <sup>2</sup>M.Suresh Babu

<sup>1</sup>Research Scholars in Department of Computer Science Bharti University Coimbatore.

<sup>1</sup>praveentkrecit@gmail.com

<sup>2</sup>Professor in Department of CSE, Teegala Krishna Reddy Engineering College Hyderabad

<sup>2</sup>sureshchse@tkrec.ac.in

### Abstract:

The transmission of medical images through Internet of Things (IoT) systems represents a significant advancement in telemedicine, enhancing the communication between doctors and patients. These systems have revolutionized medical diagnosis and treatment, offering substantial benefits in clinical practice. However, the increased reliance on IoT in medical systems has also made them vulnerable to various cyber-attacks, leading to breaches in privacy and security. While existing research has made strides in mitigating these risks, the development of robust encryption mechanisms remains a critical challenge. This study proposes a novel hybrid encryption scheme that combines Henon Chaotic Maps with Elliptic Curve Cryptography (ECC) to produce highly secure encrypted images, effectively countering cyber-attacks. The proposed hybrid approach leverages the unpredictability of chaotic maps and the strength of ECC to generate encryption keys that are resilient to attacks, ensuring the protection of sensitive medical images. To validate the effectiveness of the proposed encryption system, extensive evaluations were conducted using standard image datasets. The system's performance was assessed based on key metrics such as entropy, NPCR (Number of Pixel Change Rate), UACI (Unified Average Changing Intensity), and NIST statistical test results. The evaluation demonstrated that the proposed model achieved significant improvements, including a 32.4% NPCR, 24.6% UACI, and an entropy value of 7.67, outperforming existing encryption schemes. The results of this study highlight the potential of the proposed Henon-inspired ECC-based encryption system to enhance the security of medical image transmission in IoT-based systems, providing a more secure solution in the face of increasing cyber threats.

**Keywords:** Internet of Things, medical Imaging systems, Henon Maps, Elliptical Curve Cryptography, NPCR, UACI.

## NUMERICAL SOLUTION OF AN ORDINARY DIFFERENTIAL EQUATION SYSTEM

<sup>1</sup>D Narsimha Reddy, <sup>2</sup>Dr.Syed Shahnawaz Ali, <sup>3</sup>Dr. Kunderu Lakshmi Narayan

<sup>1</sup>Research Scholar, Sri Satya Sai University, Sehore M.P. (India)

<sup>2</sup>Research Guide, Sri Satya Sai University, Sehore M.P. (India)

<sup>3</sup>Professor of Mathematics VJIT, Hyderabad

### Abstract

Numerical methods for ordinary differential equations (ODEs) provide numerical approximations to the solutions of ODEs, often termed as "numerical integration." These methods are crucial for practical applications where symbolic solutions are unattainable, especially in fields like physics, chemistry, biology, and economics. This study explores various numerical techniques, including linear multistep and Runge-Kutta methods, and their explicit and implicit variations, suitable for both stiff and non-stiff problems. The effectiveness of these methods in solving first-order initial value problems (IVPs) is demonstrated, emphasizing their application in complex systems with varying timescales. A literature review highlights significant contributions and methodologies in numerical solutions, particularly in fluid-structure interaction and aerosol dynamics. The proposed methodology applies the fourth-order Runge-Kutta method to solve a system of six coupled nonlinear ODEs derived from the stratified Boussinesq equation. The results indicate that reducing the step size minimizes errors, improving solution accuracy. The study concludes with an evaluation of numerical methods' efficiency and stability for solving complex ODE systems.

Keywords: Numerical methods, ordinary differential equations, Runge-Kutta, linear multistep methods, stiff equations, initial value problems, fluid-structure interaction.

# ANDHRA LOYOLA COLLEGE (AUTONOMOUS)

Vijayawada - 520 008, Andhra Pradesh

## Loyola Electronics Department (L E D)



The department of Electronics was established in the academic year 1989 in Andhra Loyola College with a mission to educate the students for a career of leadership and innovation in Electronics & related fields. To expand the base of electronics knowledge and developing technology to serve the needs of society. The department has been revising and updating the course contents and laboratory facilities from time to time keeping pace with changes in technology and in meeting the growing needs of the industry. In this regard the department has been organizing workshops, seminars, hands on training programs, industrial educational tours and science expos in every academic year. At present the department is running two courses namely B.Sc. Electronics and B.Sc. Electronics Technology.



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