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## Academic Year: 2023-24

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2	Sustainability by Design: Innovative Ways of Revolutionizing Production Practices for a Better Tomorrow	Ashwin Dharme	E3S Web of Conferences	Scopus
3	Green Nanotechnology Based Sustainable Energy Solutions and Environmental Impacts	Dr. Kiran Devade	Materials Today Proceedings	Scopus
4	Review of composite materials and applications	Dr. Mahesh G. Bhong	Materials Today Proceedings	Scopus
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22	Investigating the Synergistic Effects of Hybrid Nanofillers in Polymer Matrix Nanocomposites for Superior Mechanical and Electrical Performance	Dr. Mahesh G. Bhong	E3S Web of Conferences	Scopus
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24	Advanced Materials for High-Efficiency Solar Cells: A Comprehensive Exploration in Material Science	Dr. Sunil B. Ingole	E3S Web of Conferences	Scopus
25	Enhancing Mechanical and Thermal Properties of Polymer Matrix Nanocomposites through Tailored Nanomaterial Architectures	Dr. Sunil B. Ingole	E3S Web of Conferences	Scopus
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Available online 30 August 2023

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# Advance biomedical engineering – A fundamental review of composite materials and its applications

M. Nagobushanam <sup>a</sup>, Kiran Devade <sup>b</sup>, G. Aravind Reddy <sup>c</sup>, B. Nagaraj Goud <sup>d</sup>, Rood Muhammed Sayed <sup>e</sup>, Sanjay Sood <sup>f</sup>, Pankaj Sonia <sup>g</sup>

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## Abstract

Composite materials or composites are engineered substances that comprise in two or three components with a variety of differences in their physical chemical, mechanical, and physical properties. The distinctive properties of composites are a result of their constituent components of their individual properties as well as their volume fractions as well as arrangement within the system of materials. In accordance with the application the composites are designed to meet specific geometrical mechanical, structural and even aesthetic demands. The applications of these synthetic materials are in construction, for instance in bridges and structures and the automotive industry, aeronautics, automobile bodies and naval (e.g., ships and vessels) as well as [biomedical fields](#). While polymeric, metallic or ceramic biomaterials are known to have all been used to treat medical conditions such as tissue repair and replacements for a long time but composites are only now getting noticed. The primary goal of this article is to describe composite materials and to discuss their present and future applications in the field of biomedicine. In spite of years of research and tests in a variety of [biomedical applications](#) commercial distribution and production of composite-based [medical equipment](#) was only completed. Before making use of these tools successfully you must be aware of the intended goals and their limitations.

## Introduction

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E3S Web of Conferences 511, 01031 (2024)

## Green Nanotechnology Based Sustainable Energy Solutions and Environmental Impacts

Kiran Devade<sup>1\*</sup>, Pradeep Kumar Singh<sup>2</sup>, Sandeep Kumar<sup>3</sup>, Himanshu Kumar<sup>4</sup>, Brijesh Prasad<sup>5</sup>, A.L.N. Rao<sup>6</sup> and Akhil Sankhyan<sup>7</sup>

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## Materials Today: Proceedings

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## Review of composite materials and applications

Mahesh Bhong<sup>a</sup>, Tasneem K.H. Khan<sup>b</sup>, Kiran Devade<sup>a</sup>, B. Vijay Krishna<sup>c</sup>, Sreekanth Sura<sup>d</sup>, H.K. Eftikhaar<sup>e</sup>, H. Pol Thethi<sup>f</sup>, Nakul Gupta<sup>g</sup>  

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### Abstract

This research seeks to discover and analyze the characteristics of composites that contribute to their performance improvement. Molding techniques are employed in a variety of industries to create composite products. Apart from their light weight and their high relative stiffness and strength, they have other advantages as well. Fundamental concepts comprise the material and physical properties, in addition to their design, tooling repair, inspection, and design. High-strength, lightweight materials helped to make helicopters, aircrafts, and rockets that were used for military purposes. It was evident that the components made of metal until that point were superior in terms of mechanical performance however, their weight rendered their usage ineffective. Numerous companies working in the polymer sector were expanding into new markets and expanding. The improved mechanical properties of polymers could solve a number of problems, and this was the case when researchers created a new light polymer in the laboratory. Composites are engineered materials made from two or more parts that have a wide range of physical, chemical, as well as mechanical characteristics. The distinct features of the individual parts and the arrangement of these components inside the structure lead to a myriad of distinct characteristics in composites. Composites can be altered to meet a variety of mechanical, geometrical, structural and chemical demands. Synthetic materials are utilized in various areas, such as construction (such as bridges and structures) as well as the automotive industry (such as bodywork for automobiles) as well as aviation, military (such as boats and ships) and even biology. Composites are fast becoming popular in the field of medicine, despite the fact that polymeric, metallic, and ceramic biomaterials were used for a long time in processes like tissue repair and replacement.

## Materials Today: Proceedings

Available online 26 September 2023

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## A review of armour's use of composite materials

Aniket Bhagirath Jadhav <sup>a</sup>   , Ashwini Gaikwad <sup>b</sup> , Yotika Gori <sup>c</sup> , A Somaiah <sup>d</sup> , G.V. Rambabu <sup>e</sup> ,  
Fatimah H. Al-Ataby <sup>f</sup> , Kuldeep K Saxena <sup>g</sup>

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### Abstract

Composites with a laminated structure come from stacking ceramic and metal in a particular order. Because of their high strength and hardness, low density of ceramics, and extraordinary flexibility, metals can be used as bulletproof armour. The bullet anti-penetration system includes a ceramic screen that slows down the projectile and splits it up and a metal backplate that plastically deforms to absorb the projectile's kinetic energy. Laminates have several downsides, including weak interface bonding, a tendency for tip cracks due to increased internal stress, and a jarring difference between the metal and ceramic properties. Crack migration and propagation can cause abrupt changes in material characteristics at the ceramic–metal contact. A drop between the ceramic panel and metal backplate can be easily triggered when a ceramic panel is impacted, as cracks form in the interlayer. In this area, the interface bonding strength is still inadequate. In this review, we looked at the meshless smoothed-particle hydrodynamic method for high-velocity impact and massive deformation, the finite-element simulations of interface impact resistance and the first-principles predictions of interface strength. The paper concludes with numerous suggestions for future improvement: Further study is required on ceramic toughening to increase the compatibility of ceramic panels and metal backplates, the performance transition between ceramic and metal, and the reliability of ceramic–metal laminated materials. It is critical to study ways to strengthen metals. More multiscale research using methods like the phase-field method, finite element analysis, and first-principles computations, focusing on how to mix these techniques naturally and successfully, is needed to reinforce metals by introducing nano-phases into metal matrix composites while still retaining the metal's ductility. The latest study that emphasises the potential advantages of hybrid

## Materials Today: Proceedings

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## Cold spray coating: A review of material systems and future perspectives

Pranali Khatake <sup>a</sup> , Resham Taluja <sup>b</sup>  , M. Sunil Kumar <sup>c</sup> , M. Mahendar Reddy <sup>d</sup> , Fatimah H. Al-Ataby <sup>e</sup>  ,  
Sanjay Sood <sup>f</sup>  , Pankaj Sonia <sup>g</sup>  

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### Abstract

Spraying solid powders onto a substrate at high velocity with a de Laval nozzle characterizes cold spray, also known as a cold gas dynamic spray (CS). Particles will stick to a surface if the impact velocity is high enough to create a plastic deformation. Metals, ceramics, composites, and polymers are just some materials that may be deposited utilizing CS, opening up a world of interesting possibilities for specialized harvesting applications. CS has some technological advantages compared to thermal spray due to using kinetic energy for deposition. There has been a proliferation of material combinations that can be sprayed utilizing cold spray technology due to the emergence of new material systems with superior properties in disciplines as disparate as internal combustion engines and biotechnology. The need to provide a concise summary of the state of the art increases as the amount of research into a topic grows in line with the breadth of its potential applications. This overview will discuss the various material systems studied for potentially revolutionary uses. Polymer is considered in two contexts: as a substrate and a layer, allowing us to discuss metal incorporation. CS has shown promise in depositing nanostructured materials, unlike many traditional consolidation processes, without significantly altering their microstructure. Relevant material systems, which may include nanostructured powders, are also considered. It examines microstructural bonding techniques for those relatively new material systems and discusses their potential future uses. Examples of suitable materials include ceramics, polymers, MMCs, and nanostructured powders. More study is required, particularly to quantify the relationship between process parameters and the effective behaviour of the targeted material systems.

# Physical and mechanical properties of foamed concrete, a literature review

A.N. Shankar<sup>a</sup>, Sushil Chopade<sup>b</sup>, R. Srinivas<sup>c</sup>, Nirmith Kumar Mishra<sup>d</sup>, H.K. Eftikhhaar<sup>e</sup>, Gaurav Sethi<sup>f</sup>, Bharat Singh<sup>g</sup>  

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## Abstract

Foamed concrete is distinguished from regular concrete's lightweight, high strength-to-weight ratio, and exceptional rheological and thermally insulating qualities. Foamed concrete offers reduced manufacturing and shipping costs than conventional concrete and can be used for structural components. Reduced energy consumption and self-weight of the superstructure are achieved by using foamed concrete. This article provides a comprehensive look into the mechanical, functional, and physical characteristics of foam concrete and the materials and processes involved in their production. This quantitative literature review had two main goals: (1) to pinpoint research gaps and (2) to give readers a comprehensive grasp of the many ways in which certain cell types might be put to use. Since it is both lightweight and durable, foamed concrete is a great material. Foamed concrete is employed because it reduces the foundation and support columns' load, saving energy, time, and money. As a possible structural material, it offers savings in producing and transporting construction components over traditional concrete. This paper describes the qualities, building procedures, and materials that go into making foamed concrete. This critical review aims to introduce readers to foamed concrete and its potential uses in the modern building sector. Foamed concrete's strength and density can be affected by a number of factors, including the mix proportions used, the foam agent quality and quantity, and the manufacturing technique. Fly ash, silica fumes, plastizizers can be used to increase its compressive strength.

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## Key Enabler on Efficient Resource Utilization: Technical and Managerial Investigations for Sustainable Materials and Energy Management

Rajat Yadav<sup>1\*</sup>, Mahesh Bhong<sup>2</sup>, Upendra Singh Aswal<sup>3</sup>, Mukesh Kumar<sup>4</sup>, C. Vijayendar Reddy<sup>5</sup>, B. Rajalakshmi<sup>6</sup> and Hamza Jasim Albazoni<sup>7</sup>

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## Reinventing Production: A Case Study on implementing the strategic Innovations in Sustainable Remanufacturing

Aman Sharma<sup>1\*</sup>, Mahesh Bhong<sup>2</sup>, Pravin P. Patil<sup>3</sup>, Manish Saraswat<sup>4</sup>, S. Vinod Kumar<sup>5</sup>, Manjunatha<sup>6</sup> and Hussein Ghafel Shakier<sup>7</sup>

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## Closing the Loop: Advances in Materials, Energy, and Waste Management

Gaurav Bharadwaj<sup>1\*</sup>, Sushil Chopde<sup>2</sup>, Resham Taluja<sup>3,4</sup>, G. Lalitha<sup>5</sup>, Rakesh Chandrashekhar<sup>6</sup> and Hasan Ali Dhahi<sup>7</sup>

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## Digital Dimensions: Unveiling the Potential of E-Design and Virtual Prototyping

Kanchan Yadav<sup>1\*</sup>, Sagar Chirade<sup>2</sup>, Malay Banerjee<sup>3</sup>, Manish Sharma<sup>4</sup>, N. Sri Ramya<sup>5</sup>, K. Aravinda<sup>6</sup> and Adil Abbas Alwan<sup>7</sup>

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## Reshaping Industry: Adoption of Sustainable Techniques providing Remanufacturing Solutions in High-Tech industries

Aman Sharma<sup>1\*</sup>, Ashwini Gaikwad<sup>2</sup>, Durgeshwar Pratap Singh<sup>3</sup>, Ravi Kalra<sup>4</sup>, S. Swarna Keerthi<sup>5</sup>, Vijilis Helena Raj<sup>6</sup> and Murtadha Laftah Shaghnab<sup>7</sup>

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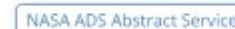
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## Eco-Revolution: Exploration on Advancing Remanufacturing for a Greener Future

Rajat Yadav<sup>1\*</sup>, Sunil Ingole<sup>2</sup>, Rajesh Prasad Verma<sup>3</sup>, Irfan Khan<sup>4</sup>, K. Venkata Ramana Devi<sup>5</sup>, V. Revathi<sup>6</sup> and Hussein Abdullah Abbas<sup>7</sup>

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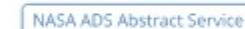
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## Regenerative Manufacturing: Crafting a Sustainable Future through Design and Production

Arti Badhoutiya<sup>1\*</sup>, Hemant Darokar<sup>2</sup>, Rajesh Prasad Verma<sup>3</sup>, Manish Saraswat<sup>4</sup>, S. Devaraj<sup>5</sup>, Vijilious Helena Raj<sup>6</sup> and Zahraa N. Abdulhussain<sup>6</sup>

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Pradeep Kumar Singh<sup>1\*</sup>, Pranali Khatake<sup>2</sup>, Yatika Gori<sup>3</sup>, Ashish Parmar<sup>4</sup>, P. Shivakumar<sup>5</sup>, R.J. Anandhi<sup>6</sup> and Saja Hameed Kareem<sup>7</sup>

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Neha Sharma<sup>1\*</sup>, Sunil Ingole<sup>2</sup>, Hemant Singh Pokhriya<sup>3</sup>, Ashish Parmar<sup>4</sup>, K. Shilpa<sup>5</sup>, Uma Reddy<sup>6</sup> and Hanan Askar Hussny<sup>7</sup>

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## Maximizing towards the Sustainability: Integrating Materials, Energy, and Resource Efficiency in revolutionizing Manufacturing Industry

Rishabh Chaturvedi<sup>1\*</sup>, Hemant Darokar<sup>2</sup>, Pravin P. Patil<sup>3</sup>, Mukesh Kumar<sup>4</sup>, K. Sangeeta<sup>5</sup>, K. Aravinda<sup>6</sup> and Ali Abdulhasan Kadhim<sup>7</sup>

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## Eco-Conscious Creation: Navigating the Nexus of Sustainability and Production Design

Pradeep Kumar Singh<sup>1\*</sup>, Sagar Chirade<sup>2</sup>, Resham Taluja<sup>3</sup>, Dinesh Kumar Yadav<sup>4</sup>, A. Srikanth<sup>5</sup>, Manjunatha<sup>6</sup> and Manal Morad Karim<sup>7</sup>

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Mahesh Bhong<sup>1\*</sup>, Rahul Singh<sup>2</sup>, Pradeep Kumar Singh<sup>3</sup>, Yadaiah Nirsammetla<sup>4</sup>, Rajesh Prasad Verma<sup>5</sup>, Manish Saraswat<sup>6</sup> and Amit Srivastava<sup>7</sup>

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Deepak Kumar<sup>1</sup>, Himanshu Kumar<sup>1</sup>, Sunil B. Ingole<sup>2\*</sup>, Soni Kumari<sup>3</sup>, Yatika Gori<sup>4</sup>, Arun Pratap Srivastava<sup>5</sup> and Akhilesh Kumar Khan<sup>6</sup>

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## Enhancing Mechanical and Thermal Properties of Polymer Matrix Nanocomposites through Tailored Nanomaterial Architectures

Sunil B. Ingole<sup>1\*</sup>, Prashant Sharma<sup>2</sup>, Rajan Verma<sup>3</sup>,  
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## Efficient Microarray Gene Expression Data Sample Classification using Statistical Class Prediction Method

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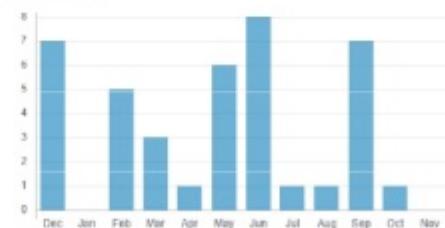
Department of AI &amp; DS, Vasantdada Patil Pratishthan College of Engineering and Visual Arts, Mumbai, Maharashtra, India

Keywords: Gene Expression, Classification, machine learning, infiltration, Expression data, Hybrid deep learning method

## ABSTRACT

Insights into numerous biological processes and disease mechanisms are provided by microarray gene expression data, which is vital for biomedical research. Classifying samples into several predetermined groups based on their gene expression patterns is one of the core tasks in microarray data analysis. Our approach makes use of a thorough pipeline that includes feature selection, classification, and data preprocessing. To ensure data quality and consistency, preprocessing procedures like normalization, missing value imputation, and noise reduction are first applied to the raw microarray data. The most insightful genes that considerably aid in the classification process are then found using a feature selection technique. We use a statistical class prediction approach based on an appropriate statistical model, such as logistic regression, support vector machines, or random forests, to carry out the classification. To ensure robustness and generalizability, the chosen model is trained on a labelled training set and its performance is assessed using cross-validation procedures. We carried out extensive tests on publicly accessible microarray gene expression datasets related to various diseases to evaluate the efficacy of our suggested strategy. The outcomes show that our strategy outperforms previous approaches in terms of classification precision, sensitivity, specificity, and overall predictive power. Additionally, we discuss the biological significance of the discovered gene markers, offering light on putative molecular pathways causing the disorders under investigation.

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In our automated world, time is the most precious of all. Technology is crucial in saving time and protecting it from being wasted. Being a technology student, it's my responsibility to contribute to automation. People nowadays never attain enough duration to visit the marketplace, purchase veggies, and examine the quality and number of vegetables. Automation is handled with Computer vision and Artificial Intelligence as its eyes and brain. Without these two, the system cannot be said a fully autonomous. Data science is chosen for core in implementing an intelligent refrigerator system which is capable of sensing fruits, veggies and other familiar entities in the fridge, such as eggs, also sensing their respective quantity and quality, such as rotten or good in this case. In addition, an auto notifying and purchasing interface is the proposal. A CNN based supervised learning model that checks quality and quantity, as well as auto-shops online, might be an excellent addition to the automation arsenal. An advanced model equipped with data analysis and artificial intelligence could be a good fit. This article discusses the concept, architecture, construction process, and final product. The study describes the concept, architecture, construction process, and functionality of a refrigerator that is exposed as an IoT object and interacts with the items stored inside, gathers information about them, processes that information into relevant data, and then communicates that data to its owners via an IoT platform, in other words, a smart refrigerator.

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## A SYSTEMATIC LITERATURE SURVEY: Student Identification, Authentication and Information Display using RFID Technology

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**Abstract-** Colleges places a strong emphasis on student attendance, as it is a factor considered in determining final grades. Some use manual paper-based records initially, while others enter data into a digital system. Attendance is vital for academic performance. There is a need for a system that makes attendance monitoring more efficient and provides insights to parents. To address this, the following article gives a brief overview of attendance systems and explores various technologies like smart cards, biometrics, and RFID for data collection. This system, which utilizes passive RFID technology, has the potential to track student attendance in a classroom. We are focusing on RFID-based student tracking, which uses an RFID reader and a contactless smart card. The reader, situated in one place, sends out a signal to the passive RFID chip within its range. The chip responds by sending back a confirmation signal along with its unique identifier code. Furthermore, a single scanner is capable of swiftly identifying a large number of chips

**Keywords-** RFID – Radio Frequency Identification, RFID Reader, Passive RFID Technology, Contactless Smart Card, Chip

## 1. INTRODUCTION

In the ever-evolving landscape of educational institutions, the demand for efficient and secure student management systems has never been greater. The traditional methods of student identification and authentication, often relying on manual processes and cumbersome paperwork, have proven to be time-consuming and error-prone. To address these challenges, the integration of Radio-Frequency Identification (RFID) technology has emerged as a game-changing solution. RFID technology is at the forefront of automating and streamlining student identification, authentication, and information display in educational settings. This innovation harnesses the power of radio waves to create a seamless and efficient system that is poised to revolutionize the way schools, colleges, and universities manage their student populations. The aim of the Automated Student Identification, Authentication, and Information Display using RFID Technology project is to enhance campus security, streamline student access, and provide real-time information by implementing RFID technology for student. Automated Student Identification, Authentication, and Information Display using RFID Technology offers a multitude of compelling motivations for educational institutions to embrace this cutting-edge solution. RFID technology provides a robust and reliable method for student identification and authentication. By using RFID-enabled cards or tags, institutions can ensure that only authorized individuals gain access to restricted areas. RFID technology generates vast amounts of data that can be analyzed to gain valuable insights. While implementing RFID technology may have an initial cost, it can lead to substantial long-term savings. The reduction in manual labor, fewer errors, and improved resource allocation can result in a significant return on investment. The adoption of Automated Student Identification, Authentication, and Information Display using RFID Technology offers educational institutions a compelling array of motivations, ranging from improved security and efficiency to enhanced student experience and data-driven insights. Automated Student Identification, Authentication, and Information Display using RFID Technology offers a multitude of compelling motivations for educational institutions to embrace this cutting-edge solution. RFID technology provides a robust and reliable method for student identification and authentication. By using RFID-enabled cards or tags, institutions can ensure that only authorized



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# Implementation of Student Identification, Authentication and Information Display using RFID Technology

Kiran Kinge<sup>1</sup>, Onkar Kshirsagar<sup>2</sup>, Mrudul Narkhede<sup>3</sup>, Parag Panzade<sup>4</sup>, Deepali Dagale<sup>5</sup>Student, Department of Computer Science and Engineering, Indira College of Engineering and Management, Pune, India<sup>1</sup>Student, Department of Computer Science and Engineering, Indira College of Engineering and Management, Pune, India<sup>2</sup>Student, Department of Computer Science and Engineering, Indira College of Engineering and Management, Pune, India<sup>3</sup>Student, Department of Computer Science and Engineering, Indira College of Engineering and Management, Pune, India<sup>4</sup>Professor, Department of Computer Science and Engineering, Indira College of Engineering and Management, Pune, India<sup>5</sup>

**ABSTRACT:** Efficient student attendance monitoring is paramount for educational institutions, influencing academic success and administrative operations. It presents a comparative analysis of attendance systems, focusing on the utilization of passive RFID technology for student tracking in classrooms. While various methods such as manual paper records, digital data entry, and biometrics are prevalent, our system stands out for its authentication and accuracy. By employing passive RFID technology, our system offers seamless student identification and attendance tracking, enhancing operational efficiency and providing valuable insights for educators and parents alike. Additionally, our system's capability to swiftly identify a large number of RFID chips sets it apart from traditional methods, ensuring comprehensive attendance management in educational environments. Through this research, we aim to contribute to the advancement of attendance monitoring systems, facilitating improved academic outcomes and administrative processes in educational institutions. In addition to the comparative analysis mentioned above, our study delves into the implementation and performance evaluation of various attendance systems in educational settings. We have conducted extensive field tests and surveys to assess the usability, reliability, and scalability of different technologies, including smart cards, biometrics, and RFID. Our findings reveal that while each method has its advantages and limitations, passive RFID technology emerges as a promising solution for student attendance tracking due to its non-intrusive nature and cost-effectiveness.

**KEYWORDS:** RFID – Radio Frequency Identification, RFID Reader, Passive RFID Technology, Contactless Smart Card, Chip

### I. INTRODUCTION

In the ever-evolving landscape of educational institutions, the demand for efficient and secure student management systems has never been greater. The traditional methods of student identification and authentication, often relying on manual processes and cumbersome paperwork, have proven to be time-consuming and error-prone. To address these challenges, the integration of Radio-Frequency Identification (RFID) technology has emerged as a game-changing solution. RFID technology is at the forefront of automating and streamlining student identification, authentication, and information display in educational settings. This innovation harnesses the power of radio waves to create a seamless and efficient system that is poised to revolutionize the way schools, colleges, and universities manage their student populations. The aim of the Automated Student Identification, Authentication, and Information Display using RFID Technology project is to enhance campus security, streamline student access, and provide real-time information by implementing RFID technology for student automated student



## H.O.P.E- FOOD DONATION SYSTEM

*H.O.P.E- An Android Application*

**Harshada Khadilkar, Shweta Mane , Dhanashri Hingade , Vaishnavi Jadhav, Prof. Pragati Malusare**  
Eng. Student, Dept. of Computer Engineering, S.C.E.S's Indira College of Engineering and Management,  
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Assistant Professor, Dept. of Computer Engineering, S.C.E.S's Indira College of Engineering and Management, Pune

**Abstract:** This study has been undertaken to investigate food waste is a wide issue in our culture. "H.O.P.E Food Donation App", a new internet-grounded android operation that provides a platform for giving leftover food to all indigent people associations operation of food waste is essential since it can increase our capability to sustain our frugality and terrain. An Android mobile operation is developed that enables businesses to give and partake their food and leavings with people in need after relating the operation of mobile technology to reduce food waste operation. The Food donation operation will try to help the stoner to contribute the food for the NGO's and the NGO's can add their request for donation. The system communicates with the patron and NGO for food donations

**Index Terms - :** Donor, Hunger spot, Food wastage, Mobile App, Firebase Authentication.

### I. INTRODUCTION

An important thing in our world moment is to exclude food waste by reutilizing available food sources within original communities leftover food particulars in caffs, stores and food distribution centres that may be approaching expiration; and any perishable particulars not used in wholeness within their asked period. This is largely significant, particularly during heads similar as the COVID- 19 epidemic. A food donation system is a coordinated trouble that facilitates the collection and distribution of fat or unused food to individualities or associations in need. This system plays a pivotal part in addressing issues of food waste, hunger, and food instability. By turning redundant food from businesses, events, or individualities to those who are less fortunate, food donation systems contribute to reducing waste and promoting social weal. This design focuses on creating an intriguing mobile operation (app) called H.O.P.E. that provides a ubiquitous platform wherein druggies can fantasize available food coffers in their original area and accordingly gain access to food, thereby diving two major issues, i.e. hunger and food waste. As per the knowledge the technology is going advanced and growing day by day. Over main aphorism is to help indigent people. In this mobile app, we've tried to reduce food destruction by giving waste food to people or association who need it. The indigent will add to a request, in case of any leftover food patron have. This request is transferred to the list of benefactors. The Available patron also accept the request and contribute it to the indigent. So, food waste is avoided.

### II. OBJECTIVES

- To reduce the quantum of food wasted and being used to the indigent people.
- Engage original Communities in addressing food instability and fostering a sense of social responsibility
- Educate druggies about food waste issue and encourage responsible food operation
- Give a stoner-friendly platform to make food donations effective



## Stock Market Prediction and Analysis using Supervised Learning

Author(s)	Ashutosh Talekar, Anirudha Landage, Lokesh Dhake, Shambhooraje Jadhav, Reshma Kohad
Country	India
Abstract	The Stock Market Remains a Captivating Subject for Stockbrokers and Investors Seeking Financial Success Through Strategic Equity Trading. Informed Decisions Are Pivotal in Navigating the Dynamic Landscape of Stock Investments, Prompting the Adoption of Various Predictive Techniques. This Study Introduces a Novel Prediction Algorithm That Elucidates the Intricate Relationship Between Independent Variables—Comprising Opening and Closing Prices, High and Low Stock Values, and Trading Volume—and the Dependent Variable, Which Is the Stock Price. Leveraging a Deep Learning System, We Demonstrate the Efficacy of Generating Precise Stock Price Forecasts. Our Research Ambit Encompasses a Comprehensive Exploration of Diverse Deep-Learning Architectures Tailored to Anticipate Stock Prices for Global Conglomerates and Indian Enterprises. A Primary Objective Is to Conduct a Comparative Analysis of These Architectures, Discerning Their Respective Performances in Stock Price Prediction Scenarios. Notably, Long Short-Term Memory (LSTM) Algorithms Are Instrumental in Achieving Heightened Accuracy and Robust Prediction Outcomes. The Methodology Entails Meticulous Data Collection From Historical Stock Market Datasets Spanning Various Companies of Global and Indian Origin. Subsequent Data Preprocessing Involves Addressing Missing Values, Standardizing Features, and Structuring the Data Into Sequences Conducive to LSTM Model Input. The LSTM Architecture, Characterized by Its Adaptiveness in Capturing Long-Term Dependencies and Temporal Patterns, Forms the Cornerstone of Our Prediction Model. Through This Research Endeavor, We Aim to Provide Valuable Insights Into the Potential of Deep Learning Algorithms, Particularly LSTM, in Facilitating Informed Decision-Making for Investors and Stock Market Participants.
Keywords	Stock Market, Price Prediction, Supervised Learning, Machine Learning, Deep Learning, LSTM.
Field	Computer
Published In	Volume 6, Issue 2, March-April 2024
Published On	2024-04-26
Cite This	Stock Market Prediction and Analysis using Supervised Learning - Ashutosh Talekar, Anirudha Landage, Lokesh Dhake, Shambhooraje Jadhav, Reshma Kohad - IJFMR Volume 6, Issue 2, March-April 2024. DOI: 10.36948/ijfmr.2024.v06.i02.18491
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## FEATURE EXTRACTION USING AT-CONVLSTM BASED CULTURAL ALGORITHM FOR IMAGE UNDERSTANDING

Shweta Nishit Jain<sup>1</sup>, Priya Pise<sup>2</sup> and Akhilesh Mishra<sup>3</sup>

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### Abstract

This research presents a novel approach for feature extraction in image understanding, utilizing an AT-ConvLSTM-based Cultural Algorithm.

The Proposed C4-AT-ConvLSTM leverages the power of deep learning through AT-ConvLSTM architecture while optimizing the feature extraction process using Cultural Algorithms. This synergistic approach enhances the efficiency and accuracy of image understanding tasks, making it suitable for a wide range of applications, from computer vision to pattern recognition. The experimental results demonstrate the superiority of the proposed technique over traditional methods, highlighting its potential in advancing the field of image analysis.

### Keywords:

Feature Extraction, AT-ConvLSTM, Cultural Algorithm, Image Understanding, Deep learning

## 1. INTRODUCTION

In image understanding, feature extraction plays a pivotal role in deciphering meaningful information from visual data. Effective feature extraction techniques are essential for a wide spectrum of applications, including computer vision, medical imaging, and autonomous systems [1]. Traditional methods have long been employed for this purpose, but recent advances in deep learning have shown remarkable promise in improving the quality and efficiency of feature extraction processes [2].

Traditionally, feature extraction methods relied on handcrafted features and filters, making them highly dependent on domain knowledge and often limiting their adaptability to diverse datasets [3]. With the advent of deep learning, Convolutional Neural Networks (CNNs) have emerged as a transformative technology, automating the feature extraction process and achieving state-of-the-art results in various image analysis tasks [4]. However, challenges persist in optimizing the feature extraction process further and enhancing the adaptability of these networks to different contexts and data types [5].

The challenges in feature extraction revolve around the need for effective representation of visual data, adaptability to various domains, and computational efficiency [6]. Traditional handcrafted feature extraction methods often struggle to capture complex patterns and require extensive domain expertise for feature selection [7]. CNN, while highly effective, may not always generalize well to diverse datasets and can be computationally intensive, particularly for real-time applications.

The core problem addressed in this research is to improve feature extraction methods for image understanding by leveraging the AT-ConvLSTM architecture and optimizing the process using Cultural Algorithms. Specifically, the aim is to develop a novel approach that combines the strengths of deep learning and

evolutionary optimization to enhance the efficiency, accuracy, and adaptability of feature extraction for diverse image analysis tasks.

The research aims to design an AT-ConvLSTM-based feature extraction framework that can effectively capture complex spatial and temporal patterns in visual data. It integrates Cultural Algorithms into the feature extraction process to optimize feature selection and improve adaptability. It evaluates the proposed approach on a variety of image understanding tasks, including but not limited to object recognition, scene classification, and medical image analysis. It compares the performance of the proposed approach with traditional feature extraction methods and standard deep learning architectures.

The novelty of this research lies in the integration of AT-ConvLSTM architecture with Cultural Algorithms for feature extraction in image understanding. This fusion of deep learning and evolutionary optimization offers a unique and powerful solution to address the challenges associated with feature extraction, providing a more adaptable and efficient approach.

This research contributes a novel feature extraction framework that not only leverages the strengths of AT-ConvLSTM but also harnesses the optimization capabilities of Cultural Algorithms. The proposed approach is expected to advance the field of image understanding by enhancing the accuracy and efficiency of feature extraction across various application domains, ultimately leading to improved performance in image analysis tasks.

## 2. RELATED WORKS

Several studies have explored the use of deep learning techniques, such as CNNs and Recurrent Neural Networks (RNNs), for feature extraction in image understanding tasks. These approaches have shown remarkable success in automatically learning discriminative features from raw image data [8]. Cultural Algorithms have gained attention in optimization tasks due to their ability to combine both individual learning (exploration) and social learning (exploitation). These algorithms have been applied in various domains, including parameter tuning for machine learning models and image processing [9]. The AT-ConvLSTM architecture has been proposed as an innovative solution for capturing both spatial and temporal features in video and image data. Its effectiveness in tasks such as action recognition and video understanding has been demonstrated in recent research.

Some studies [10]–[11] have explored hybrid approaches that combine traditional handcrafted features with deep learning-based features. These approaches aim to leverage the strengths of both methods to improve feature representation and extraction in

## Enhancing MQTT Security in the Internet of Things with an Enhanced Symmetric Algorithm

PDF (<https://journal.esrgroups.org/jes/article/view/758/1181>)

DOI: <https://doi.org/10.52783/jes.758> (<https://doi.org/10.52783/jes.758>)

### Keywords:

MQTT, HMAC (Hashed Message Authentication Code), Privacy, Data Integrity, IoT (Internet of Things)

Rupali Atul Mahajan, Rupesh G. Mahajan, Manjusha Tatiya, Ujjwala Hemant Mandekar, Minal Shahakar, Yogendra Patil

## Abstract

The Internet of Things (IoT), which connects billions of gadgets to expedite operations and enhance our lives, has completely changed the way we interact with our environment. With MQTT (Message Queuing Telemetry Transport) emerging as a popular communication protocol within the IoT ecosystem, the vast proliferation of networked devices has, however, presented serious security challenges. In order to strengthen MQTT security, this study suggests using an improved symmetric algorithm. Existing MQTT implementations frequently rely on simple security safeguards, making them susceptible to dangers like data manipulation, eavesdropping, and unauthorized access. Our research presents a novel symmetric algorithm designed to meet the particular needs of MQTT communication as a defense against these weaknesses. In order to protect the confidentiality and integrity of data transferred between IoT devices and brokers, this algorithm provides powerful encryption mechanisms. Additionally, it optimizes resource usage to take into account the limitations of IoT devices, which frequently have constrained computational and memory resources.

### Issue

Vol. 20 No. 1s (2024) (<https://journal.esrgroups.org/jes/issue/view/62>)

### Section

### Articles



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### Author Biography

[1]Dr. Rupali Atul Mahajan

[2]Dr. Rupesh G. Mahajan

[3]Dr. Manjusha Tatiya

[4]Dr. Ujjwala Hemant Mandekar

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# Empowering IoT Healthcare Systems with Deep Learning: From Sensor Data Fusion to Predictive Modeling and Intervention

PDF (<https://journal.esrgroups.org/jes/article/view/986/842>)

DOI: <https://doi.org/10.52783/jes.866> (<https://doi.org/10.52783/jes.866>)

## Keywords:

IoT Healthcare Systems, Deep Learning, Sensor Data Fusion, Predictive Modeling, Intervention Strategies

Minal Shahakar, Rupesh Mahajan, Sarika Sawarkar, Yashanjali Sisodia, Manjusha Tatiya, Yogendra Patil

## Abstract

Adding Internet of Things (IoT) technology to healthcare systems has changed the way patients are cared for by letting them be monitored and data collected in real time. This essay looks at how deep learning can be used to improve IoT-enabled healthcare systems, with a focus on combining sensor data, making predictions, and coming up with ways to help. Sensor data fusion is a key part of putting together data from different sources, like medical equipment, smart tech, and electronic health records. Deep learning algorithms, especially CNN and RNN are very good at handling different types of data streams. This makes it possible to get a full picture of a patient's health. Healthcare professionals can get a full picture of a patient's health by combining information from many sources, such as bodily signs, exercise levels, and outdoor factors. Based on past data, predictive modeling uses the power of deep learning to guess what will happen with people's health in the future. IoT healthcare systems can predict how a disease will get worse, find risk factors, and suggest early treatment using methods like long short-term memory (LSTM) networks and attention mechanisms. These prediction models allow for quick treatments, methods for preventive care, and the best use of resources, which improves patient results and lowers healthcare costs in the long run. Deep learning also makes it easier to come up with smart management methods that are specific to each patient's needs. Machine learning algorithms can make personalized treatment suggestions and adaptable care plans by looking at real-time monitor data along with old patient records. These treatments could include changes to medications or lifestyles, or tips for medical workers. These give patients and healthcare staff more information to help them make better choices and better handle chronic conditions. When IoT technology and deep learning are combined, they have the ability to completely change the way healthcare is provided. IoT-enabled healthcare systems can improve patient tracking, analysis, and treatment by using advanced algorithms for sensor data fusion, predictive models, and smart actions. This leads to better quality of care and better health results.

## Issue

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## Section

Articles



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## Research Article

### Security-aware analytical framework : A mathematical model and machine learning for dynamical system control in secure environments

Jaya Chandwani\*, Gauri Dhopavkar, Manjusha Tatiya, Nitin Chakole,

Shalilash V. Kulkarni & Nilesh Shelke

Pages 715–727 | Published online: 12/04/2024

<https://doi.org/10.47974/JDMSC-1922>

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[Security-aware analytical framework](#) [Dynamical system control](#) [Secure environments](#)

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## Abstract

This study presents a Security-Aware Analytical Framework (SAAF) that is meant to make dynamic system control better in safe places. The framework uses a new mathematical model and advanced machine learning methods to make vital systems more resistant to possible security threats. The mathematical model gives a defined picture of how the system works and where its security holes are. This makes it possible to measure risks and come up with proactive control strategies. Using machine learning techniques, the system changes with changing danger scenarios, allowing for identification and reaction to threats in real time. A risk evaluation tool, a dynamic danger prediction model, and an adaptable control system are some of the most important parts of the SAAF. The risk assessment tool checks for weaknesses in the system, and the dynamic threat prediction model uses machine learning to guess when security might be broken. These guesses are used by the adaptive control method to change system settings on the fly, which improves security without lowering working efficiency. The suggested framework works well by being simulated in a number of safe settings. These settings show how it can reduce security risks and make sure that dynamic systems are strong even as threats change. This study helps to improve methods that focus on security for protecting key assets.

## Impact of Digital Pedagogy on Student Satisfaction during Pandemic

Poornasankar\*, S. Vijayanand\*\*, B. Jayaram\*\*\*, S. Logesh Kumar\*\*\*\*

### Abstract

Recently, transmission of knowledge to the students is much persuaded by e-learning methods against traditional one where there existed a possibility of interaction and sharing of their ideas. Particularly during pandemic period from January 2020, this virtual learning has its effect during the March 2020 - November 2021 and most of the institutions have implemented the digital Pedagogy and this situation create a chance for the researchers to study the effect of this virtual teaching on the level of satisfaction among the college students on Pan India basis. For this purpose, 935 respondents were selected through simple random sampling method and outcome has witnessed the important relationship between the socio-demographic profile and construct that influencing digital pedagogy like systems approach, academic development, academic support and the satisfaction level among the students and all the factors were highlighted as a significant forecaster towards the level of satisfaction among the students.

**Keywords:** Academic Support, Digital Pedagogy, Network, Online Courses, System Approach.

### Introduction

The nation has made a fast progress in the ICT domain that equipped the digital classroom with adequate infrastructure in the Higher education. The current technology trends and widespread internet facilities inexorably lead to innovative

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## Role Of Artificial Intelligence In Modern Education System

Dr. Kajal Chheda<sup>1</sup>, CHANDRASHEKARA A C<sup>2</sup>, Dr. Poorna Shankar<sup>3</sup>, Mauricio Lima-Narváez<sup>4</sup>, Santiago Otero-Potosí<sup>5</sup>, Emperatriz Fuertes-Narváez<sup>6</sup>

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### Abstract

The main thrust behind change that is fixated on understudies' needs and requests is artificial intelligence. This study explores and explains what personalized learning is, as well as the capability of an intelligent tutoring framework in it. The book additionally examines how the utilization of intelligent tutoring systems has further developed understudy execution and diminished the cost of preparing offices and the educational framework. The data for this study was accumulated utilizing various procedures, including Web research, confidential meetings, on location perceptions, and educational center gatherings. The review looks on the utilization of artificial intelligence in education (AIEd) to make individualized learning programs for students. A contextual investigation of AIEd application in education is introduced in the report. The current exploration could act as a hypothetical starting point for various educational organizations getting ready to apply artificial intelligence to adjust to individualized learning.

**Keywords:** Artificial Intelligence, Education, Intelligent tutoring systems, personalized learning.

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## Predictive Model of Personalized Recommender System of Users Purchase

| Chapter | First Online: 01 August 2023

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Darshana Desai

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### Abstract

Real-time personalization is adopted by e-commerce websites to leverage business opportunity offering recommendations that cater users' implicit need, but little is known about its effect on users' privacy concerns and trust toward purchase behavior. This research develops a predictive model exploring the effect of personalization on users' trust and privacy concerns toward personalization and interrelation with the willingness to purchase from e-commerce site. SEM is used to develop a model based on EFA and CFA results. The result shows the model fit which of personalization and role of personalized



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### Exploring the Complexities of GPS Navigation: Addressing Challenges and Solutions in the Functionality of Google Maps

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##### Abstract:

Google map is one of the popular GPS systems used in smartphones these days. This research explores the journey of addressing obstacles and improving the functionality of one of the world's most popular mapping platforms. Google Maps has become an integral part of modern navigation, offering users access to detailed maps, real-time traffic information, and route guidance. However, the continuous evolution of technology and the ever-increasing user expectations pose significant challenges in providing a seamless and efficient navigation experience. This research delves into the key challenges faced by Google Maps and investigates innovative solutions to enhance its functionality. The study examines various aspects such as data ingestion, geospatial database management, map rendering, routing algorithms, real-time data integration, user interface design, and scalability considerations. By analyzing these components, the research aims to propose an architectural model that addresses the identified challenges and leverages emerging technologies to improve Google Maps' capabilities.

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## Secure Authentication Protocols For Internet Of Things (IoT) Devices

Publisher: IEEE

P. William ; Poomashankar ; Anurag Srivastava ; Nandita Tripathi ; Anil ; Ashish Singh All Authors +

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#### Abstract



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The ability to give typical gadgets an extra technique for distinguishing proof and correspondence is known as the Internet of Things (IoT). The scope of IoT application spaces is extremely wide and incorporates things like wearables, savvy urban areas, shrewd homes, and e-wellbeing. Accordingly, many billions or perhaps many billions of gadgets will be connected together. These shrewd gadgets will actually want to assemble information, process it, and, surprisingly, come to decisions all alone. In these circumstances, security is totally important, and authentication specifically is of extraordinary significance given the potential mischief that could result from a maverick unauthenticated gadget in an IoT framework. IoT has as of late arisen as the state-of-the-art innovation that is intensely affecting business, medical services, and military applications. Remote correspondences are especially powerless to security takes a chance since anything associated with the internet is an objective for programmers and a possible wellspring of cyberattacks. Numerous IoT issues are presenting security gambles and forestalling Start to finish encryption during information transmission. Most of IoT gadgets presently being used don't have further developed arrangements or security frameworks, which makes them helpless against programmer assaults.

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## Students Psychology towards Bridging the Gap between Academia and Corporate

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### Abstract

This research paper explores the perceptions of students towards bridging the gap between academia and the corporate sector, with a focus on understanding the effectiveness of internships in achieving this objective. A quantitative research methodology was employed to gather data from 266 undergraduate and postgraduate students in a leading South Indian university. The study utilized a Likert scale-based questionnaire to assess students' perceptions related to practical skills, industry exposure, and the integration of real-world projects in the curriculum. The findings reveal that students hold a positive perception towards bridging the gap between academia and the corporate sector. Moreover, they view internships as an effective medium in enhancing their practical skills, knowledge, and employability prospects. The research underscores the importance of integrating practical learning experiences and fostering connections with the corporate sector to better prepare students for their future careers. These findings have implications for academic institutions and the corporate sector in their efforts to bridge the gap and create a more industry-ready workforce.

**Keywords:** bridging the gap, academia, corporate sector, internships, practical skills.

### Introduction

In today's fast-paced and interconnected world, the chasm between academia and the corporate sector has become increasingly evident. While academic institutions strive to impart theoretical knowledge and foster critical thinking, the corporate world demands practical skills and real-world problem-solving abilities. This gap poses significant challenges for students transitioning from the classroom to the professional sphere, leading to a growing interest in bridging the divide between academia and the corporate world. This essay seeks to explore the psychology of students in their approach towards this critical aspect of modern education. The relationship between academia and the corporate sector has long been a topic of debate and speculation. Historically, academic institutions have operated in isolation, with a primary focus on research, theoretical exploration, and knowledge dissemination. On the other hand, the corporate world has been characterized by its results-driven approach, emphasizing practical applications and economic efficiency. As students grapple with the prospects of their future careers, they are confronted with the challenge of reconciling the often contrasting principles and methodologies of these two domains. One prevailing psychological response among students is optimism and enthusiasm towards bridging the gap. Many students recognize the potential benefits of forging a stronger connection between academia and the corporate world. They believe that such integration could offer them invaluable practical experiences, internships, and employment opportunities that complement their academic knowledge. This optimism is fueled by the desire to be better prepared for the job market and to make a meaningful impact in their chosen fields. However, alongside optimism, there exists a significant amount of skepticism among students. They may question whether the intertwining of academia and corporate interests could lead to biased research,

## Talent Management Practices in the IT Sector:A Pune-based Analytical Study

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### Abstract

Effective people management is a key factor in an organization's success in a competitive market. Talent management, in its broadest sense, refers to the application of integrated strategies or systems intended to boost workplace productivity through the development of better procedures for luring, nurturing, employing, and retaining individuals who possess the aptitude and skills needed to meet present and future business needs. According to a poll conducted among over 35,000 companies across 23 countries, 40% are having difficulty finding suitable applicants. Socioeconomic and cultural issues have arisen as a result of greater globalization due to the liberalization of trade rules, commercial corporations shifting manufacturing to low-cost locations, and the associated creation of global supply chains. Furthermore, talent today manifests itself in a variety of ways, including tourists, refugees, business travelers, students pursuing degrees, and migrants crossing borders (temporarily or in search of new homes). Thus, international migration is a result of the need for skill. There are difficulties in managing personnel globally, and these issues have a big impact on growth and sustainability. An attempt has been made by the researcher to provide a summary of the talent management strategies used by the ten Pune-based IT organizations that make up the sample of 200 employees. ANOVA and multiple regressions are two statistical procedures that have been used to analyse the data and provide statistical conclusions.

**Keywords:** Talent acquisition, Employee engagement, Performance management, Talent retention.

Talent management involves acknowledging an individual's unique skills, originality, inventiveness, and analytical aptitude. These attributes should be valued and supported in order to uphold human values and raise living standards. Talented workers have the ability to boost an organization's overall performance because of their ambitions, drive, and entrepreneurial spirit. Both the company and the staff benefit from their wealth and happiness. Talented staff management demands an integrated, strategic approach from the organization, spanning from talent identification to organizational culture transformation. Other elements of talent management include talent acquisition, talent selection, talent retention, and talent succession in between. Talent recognition is a challenging endeavor that requires the management to be objective, to treat the talent with the utmost respect and care, and to employ a range of appraisal techniques. When it comes to changing the culture of the company, the senior leadership should embrace talent with generosity and have the vision to see that the organization's success and well-being rely on its skilled workforce. The company ought to consider why skilled workers stay on staff, particularly in these days of intense competition and lucrative global and national business environments.

Talented workers are drawn to those companies, which establish positive reputation for caring for their important staff members. It functions in a similar way to improve an organization's productivity and popularity as a strong product brand identification between consumers and well-known businesses. For the organization's long-term growth, hiring bright people should be transparent and done in accordance with the meritocracy principle, which values originality. Because lotuses grow in muddy water, future selection should be based on equitable chance for all, regardless of caste, creed, colour, and rural-urban bias. Talent retention is similar to an infant's development, which requires complete parental care. It becomes increasingly important, particularly in these modern times when such people's mobility is unthinkable. Talented staff replacement comes at a huge

# Biological activity and biomolecule interaction of pyridyl thiazole derivative and its copper complex

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## Highlights

- Pyridyl thiazole derivative (PT) and its copper complex (PTC) were synthesized.
- PTC exhibited positive antibacterial and anticancer activity.
- Binding interaction of HSA and DNA with PT and PTC were examined by spectroscopic methods.
- Molecular docking studies supported the experimental findings.

## Abstract

This article discusses the synthesis of pyridyl thiazole derivative (PT) and its copper complex (PTC – Pyridyl Thiazole Copper Complex) for studies related to biological activities and biomolecule interaction. Synthesized compounds were characterized, and their biological activities were tested. The metal complex, PTC exhibited positive antibacterial and anticancer activity. The complex PTC inhibited MCF-7 cells at IC<sub>50</sub> of 516µg/mL as compared to the ligand PT which showed IC<sub>50</sub> of 868µg/mL. The PT ligand showed inhibition of *S. aureus* with a minimum inhibitory concentration (MIC) of 50µg/mL. While PTC exhibited inhibition against both *S. aureus* and *E. coli* organisms with