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NEWS LETTER

2024-2025

FOUNDER OF V.S.B

Shri. V.S. Balsamy B.Sc., L.L.B.,

CHAIRMAN'S MESSEGE

=It brings me immense pride and joy to witness the remarkable growth and accomplishments of V.S.B College of Engineering Technical Campus. Since its inception, the institution has stood firm on the foundation of quality education, discipline, and innovation, values that continue to guide our path forward.

In today's dynamic world, education must go beyond the confines of textbooks. At VSBCETC, we strive to create an environment where students are inspired to think creatively, act responsibly, and lead with integrity. Our focus has always been on shaping technically proficient, ethically grounded, and socially responsible professionals who can contribute meaningfully to society.

I am particularly proud of our faculty members, who consistently set benchmarks in teaching and research, and our students, who continue to make us proud through their achievements in academics, industry, innovation, and extracurricular pursuits.

Through this magazine of the department of Artificial Intelligence and Data Science, we present a glimpse of the vibrant academic life, milestones, and memories that define our institution. As we move ahead, I assure you that we will continue to adapt, grow, and uphold our mission of delivering excellence in education.

Let us continue to dream big, aim high, and build a future that reflects the best of our potential!

VISION OF THE INSTITUTE

We endeavor to impart futuristic technical education of the highest quality to the student community and to inculcate discipline in them to face the world with self-confidence and thus we prepare them for life as responsible citizens to uphold human values and to be of services at large. We strive to bring up the Institution as an Institution of Academic excellence of international standard.

MISSION OF THE INSTITUTE

We transform persons into personalities by the state of the art infrastructure, time consciousness, quick response and the best academic practices through assessment and advice.

VISION OF THE DEPARTMENT

To offer a quality education in Computer Science and Engineering, encourage life-long learning and make graduates responsible for society by upholding social values in the field of emerging technology.

MISSION OF THE DEPARTMENT

The Department strives to contribute to the expansion of knowledge in the discipline of Computer Science and Engineering and aims:

- To produce graduates with sound technical knowledge and good skills that prepare them for a rewarding career in prominent industries.
- To promote collaborative learning and research with Industry, Government and International organizations for continuous knowledge transfer and enhancement.
- To promote entrepreneurship and mould the graduates to be leaders by cultivating the spirit of social and ethical values.

PROGRAMME EDUCATIONAL OBJECTIVES :

PEO1: Work in Multinational companies and become successful IT professionals.

PEO2:Pursue higher studies and have their career in educational institutions research organizations, or be entrepreneurs.

PEO3:Possess social responsibility, team work skills, leadership capabilities and urge for learning in their professional fields.

PROGRAM OUTCOMES (PO)

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAM SPECIFIC OUTCOMES

PSO1
Addressing societal problems through design and development of software and firmware solutions using latest Computer Science tools and technologies.

PSO2
Involving students enthusiastically in software development, software testing, storage, computing and business intelligence sectors.

PSO3
Making them to use their technical expertise in latest technologies and update knowledge continuously in Computer Science and Engineering to excel in career.

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PAPER PUBLICATIONS BY FACULTY:

Transforming Big Data Challenges into Opportunities: An In-depth Analysis of Microsoft Power BI for Analytics and Visualization

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***Abstract*—In the modern big data-driven business environment, organizations face the dual challenge and opportunity of managing and utilizing large volumes of data. Microsoft Power BI offers robust solutions for these challenges, providing advanced analytics and comprehensive visualization tools that transform complex data sets into actionable intelligence. This paper explores the capabilities of Power BI to integrate seamlessly with existing data systems, enhancing operational efficiency and strategic decision-making across various industries. To demonstrate how Power BI aids businesses in data visualization and analytics, this article employs theoretical analysis and experimental research to demonstrate how Power BI simplifies the understanding and implementation of complex analytics. The study also examines future trends in business intelligence tools, highlighting the integration of artificial intelligence and machine learning technologies that continue to enhance the predictive capabilities of Power BI.**

***Index Terms*—Big Data, Microsoft Power BI, Visualization, Dashboard.**

I. Introduction

Companies that wish to remain competitive in today's data-driven market need to have the capacity to handle massive amounts of data efficiently. As an organization grows with ever-increasing volumes of data, known colloquially as big data, the challenges of managing, analyzing, and visualizing this data have escalated [1], [2]. However, these challenges also present significant business opportunities to improve decision-making, optimize processes, and predict future trends. Microsoft Power BI provides a strong alternative to Tableau by tackling problems with deep analytics and broad data visualization features [3].

Transforming big data into actionable insights is vital for operational efficiency and strategic planning. Microsoft Power BI supports this transformation by offering an intuitive platform that integrates smoothly with existing data systems, democratizing access to data analytics and fostering a data-centric culture within organizations. It is an important tool for dealing with the complexity of big data because it can connect to many data sources, handle large amounts of data quickly, and display data in interactive ways.

This study aims to critically evaluate and empirically demonstrate the application and efficacy of Power BI for visualising the AdventureWorks Microsoft sample database. Target audience researchers and IT professionals would benefit from this work. Lastly, we discuss the future implications of BI tools in big data, emphasizing continual advancements and integrating cloud computing and machine learning (ML) technologies, which enhance predictive analytics and decision-making processes [4].

A. Contributions of this Study

The contributions of this study are:

- Developed an experimental setup for deploying the PowerBI visualization tool.
- Demonstrated Power BI to enhance sales predictive analytics capabilities.
- Discussed future trends to achieve a significant improvement in business decision-making.

The rest of this article is structured as: Section 2 discusses and summarizes the relevant related work. In Section 3, the PowerBI experimental setup was presented. In Section 4, the proposed methodology, results and discussion are presented. Finally, Section 5 presents concluding remarks and discusses future directions.

II. Related Work

Integrating Microsoft Power BI in various industries highlights its broad applicability and effectiveness in enhancing

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The paper titled "Transforming Big Data Challenges into Opportunities: An In-depth Analysis of Microsoft Power BI for Analytics and Visualization" provides a comprehensive evaluation of Microsoft Power BI as a solution for managing and visualizing large-scale data. Authored by Piyush Charan, K. Hema Latha, Neelamegam G, Rajiv Verma, Subhram Pal, and Ganesh Ramesh Telumbude from various academic institutions across India, the study highlights Power BI's capabilities in integrating, analyzing, and visualizing data to support real-time analytics and decision-making. It emphasizes the tool's relevance for researchers and professionals in overcoming big data challenges and enhancing business intelligence.

Multi-Agent Systems for Autonomous IoT Network Management Using Distributed Reinforcement Learning

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***Abstract*: The ever-growing complexity of IoT networks ignited by their wide scale adoption in applications such as smart cities, the industrial automation, and health care, compelled to develop sophisticated yet resource efficient and scalable network management solution. Centralized systems are traditional in architecture, which leads to higher latency and bottlenecks, while decentralized systems can distribute workloads however the lack of adaptability to real time, along with the difficulty of extracting maximum resource usage, are limitations. In recent years, reinforcement learning (RL) based approaches have taken shape as a promising alternative to facilitate the automated learning and optimization of task management. However, there are two challenges for existing RL based methods: slow convergence, inefficient priority assignment of tasks, and poor coordination amongst agents in the case of dynamic, large scale IoT environment. To solve these challenges, in this research we propose a distributed reinforcement learning based multi agent framework for managing IoT network. The framework also integrates a task prioritization mechanism to dynamically choose an optimal task allocation solution. Further validation was performed in a simulated IoT environment where real world inspired datasets were used. The proposed framework demonstrated 30% more task throughput than centralized, 25% less latency than decentralized, and 40% more energy efficiency than current RL based systems. The system was further validated using advanced visualizations such as anomaly detection maps and resource allocation efficiency graphs, demonstrating its capacity to manage dynamic load of tasks and resource allocation. The proposed framework addresses the critical limitations of current methods, through scalable, adaptive, and energy efficient framework for managing IoT network, and accordingly helps advancing the intelligent and autonomous IoT systems.**

***Keywords:** IoT Network Management, Distributed Reinforcement Learning, Resource Optimization, Multi-Agent Systems*

I. Introduction

In the context of growing IoT (Internet of Things) based systems deployment in domains like smart cities, industrial automation, healthcare, and environmental monitoring, managing of complex distributed networks has become more of a challenging task [1]. Such systems involve numerous heterogeneous devices in order to collaboratively perform tasks such as data collection, transmission, processing and decision making [2]. Therefore, efficient management of IoT networks is vital to ensure the smooth running, scalability and adaptability in a dynamic, real world. Current centralized systems use a single control unit for decision making, resulting in bottlenecks and long delays as the network size increases. However, decentralized systems distribute workload to agents but with minimal cooperative algorithms for real time adaptability, implying inefficient task allocation and high energy consumption. To overcome these limitations, RL based approaches have demonstrated potential to enable the agents to learn autonomously an optimal policy for task management and resource allocation [4]. Although there has been a plethora of RL-based solutions, many of them are slow to converge, suboptimal at prioritizing tasks, and challenging to coordinate across many agents in large scale networks.

In this research work, a framework addressing these challenges in IoT networks using a distributed reinforcement learning is proposed. The framework lets agents learn and collaborate to gain knowledge more quickly and consistently make decision across the system [5]. Task prioritization mechanisms are integrated into task scheduling and resource allocation using a methodology that dynamically optimizes the combination to meet latency and energy efficiency targets, as well as to rank tasks based on their criticality. In addition, to handle dynamic changes, the proposed system also includes failure tolerant mechanisms. Fig. 1 shows the Multi-Agent System for Autonomous IoT Network Management where building blocks are intricately interwoven. The Communication Module processes and forwards data between vehicles and the Traffic Management System. It coordinates action, sends instructions, and feeds back to Cloud Storage to analyze the results that come back from the AI Processing Unit. Environment is monitored and anomalies are detected, those are shared with the Infrastructure that coordinates those actions and information flow. The AI Processing Unit analyzes updates and patterns

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The research paper titled "Multi-Agent Systems for Autonomous IoT Network Management Using Distributed Reinforcement Learning" was presented at the 2023 3rd International Conference on Intelligent Systems, Advanced Computing and Communication (ISACC). Authored by Neelamegam G, Rajaram Venkatesan, Ramu SR, R.S. Ramya, Akshay J, M. Sundaramoorthy, and Manoj Deepak Choudhary from various engineering institutions in Tamil Nadu, the paper addresses the limitations of centralized IoT network management and proposes a distributed reinforcement learning-based multi-agent framework. This system enables intelligent traffic classification, anomaly detection, and resource allocation, validated through simulations and real-world data, demonstrating improved throughput, latency, and scalability for autonomous IoT environments.

JOURNAL PUBLICATIONS BY FACULTY

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Case Study on Flyover Construction and the Air Quality Measurement by the Emission Level of Pollutants

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Abstract

In the present condition, the advent of transportation technology allows users to use road transport for their mobility needs. However, rising populations and increased public transportation networks have increased traffic levels. Flyover construction is implemented in smart cities for the easy movement of vehicles. Significant drawbacks during the construction of the flyover are the diversion of roads that leads to traffic congestion, the greater travelling distance to reach the destination point, and the fuel consumption of vehicles. The level of air pollution due to automobile emissions leads to health-related issues for the people residing near the flyover construction places. The air quality is based on the level of emission components like Carbon Monoxide (CO), Carbon Dioxide (CO2), Particulate

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This research paper titled "Case Study on Flyover Construction and the Air Quality Measurement by the Emission Level of Pollutants" investigates the environmental impact of urban flyover construction, particularly its effect on air quality.

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QUANTUM LAMPORT ONE-TIME DIGITAL SIGNATURE CRYPTOGRAPHY FOR SECURED DATA COMMUNICATION FOR INDUSTRIAL IOT

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ABSTRACT

Cloud Computing (CC) as well as Internet of Things is broadly employed in Industrial Internet of Things. Industrial Internet of Things is a promising technology through vast amount of smart connected tools containing sensing, storage, as well as computing capacities. Digital signature lately played an increasingly significant role in security. The security is employed in IIoT to protect stored data from unauthorized user access. In today's growing concern for security, we have developed a novel secured data communication method called Quantum Lamport One-Time Digital Signature Cryptography. It is combined with three major processes: key generation, signing, and verification during secured data communication to enhance the security level of industrial information through improved confidentiality rate, greater integrity, and less time. In a key generation, industrial data as input is considered. The keys are generated by the Cloud Server in the CC for the registered cloud users by Lamport One-Time Key Generation by using linear congruential generator. It employed to sign solitary message and be distinct from another user, therefore ensuring data confidentiality. Next, the Modular Arithmetic-based Digital Signature model is utilized to perform the signing process thereby ensuring authentication accuracy. Finally, verification is carried out for secured data communication for industrial IoT via CC. The proposed Quantum Lamport One-Time Digital Signature Cryptography has estimated by dissimilar metrics where outcomes attained confirm its efficiency in comparison to conventional solutions. It aids to enhance 18% data confidentiality, 9% data integrity, 26% authentication accuracy and reduce 18%

The paper titled "Quantum Lamport One-Time Digital Signature Cryptography for Secured Data Communication for Industrial IoT" by Flindson W.G.J. and Divya S.V.P., published in BRADLEYA (Vol. 43, Issue 1, 2023), explores a secure communication model for Industrial Internet of Things (IIoT) using quantum cryptographic techniques

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Guest Role of Computer

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Abstract: In this paper discuss about the firmware .more computer are alive with the hardware and software. But this software and hardware are activated by firmware. Without firmware we can not connect hardware and software. Because of it is one layer of the operating system on the top. In embedded system also have the firmware . this is also link or fix between software and hardware devices. In this process are same as the middleware. Because of middleware act or transfer the data from one device to another with the help of middleware. The middleware also have the firmware. Some time middleware act as a firmware. But all middleware is not a firmware. Some middleware are firmware. Because it is interact between the system either software or hardware separately hardware can connect to the software and software connect to the device. All are wit in the help of firmware. Without firmware without connection to other software and other hardware devices. Because we are told guest role of computer or electronic devices to utilize the firmware. The firmware is a more essential to computer or electronic devices to connect all activated by the firmware.

Key words: firmware, software, hardware, middleware, embedded.

INTRODUCTION

The firmware is more essential of whole computer or electronic devices. Which is connect to work and activated. While execution are made by the operating system or application. That operating system are fix or link between operating system and application programs. Then only the system are your application programs. the application programs are separate .Then system program are separate. The application program are separate. Execute via through the firmware. Firmware is the top layer of the operating system. Not only operating system and also application programs, embedded system, middleware. These are executed by the software and hardware executed with the help of firmware.

The BIOS(basic input output system) are activated to the (connected to the) system or electronics devices. In other hand different hardware and application programs are link ans share the data (information) by the the firmware. because it is do the guest role of computer. Without guest can not functioning in festivals like as without firmware can not function the digital device or computer peripherals. Before link the device: then only link the firmware. So firmware is the guest role of computer.

Why…..?

First understand firmware and middleware. The firmware directly embedded to the hardware. But middleware separate by the software .The middleware is link between software and other software. These firmware and middleware more or less do the same process. But some middleware are not firmware.

BIOS(basic input output system)-is firmware

Boot loader- is firmware

Instruction set -is firmware not middleware.

These two guest to function of computer device and user. The main guest in the firmware used all types of electronic devices or embedded system also.

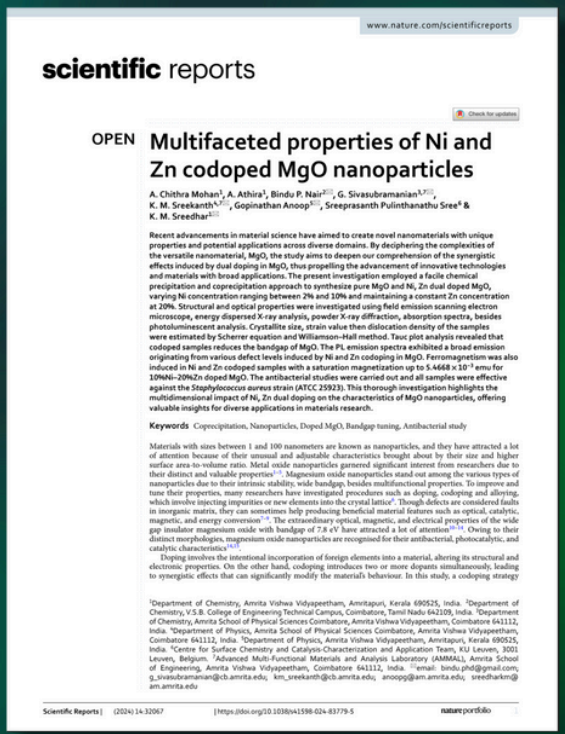
BIOS(Basic input output system).Which is link between other devices(electronics) .That is …. pendrive, camera, scanner ,printer… etc all are activated and connected to firmware then only connect to the device to the computer.

Boot loader is a firmware. Which activate system software by firmware . Instruction set which is also software instruction set will be connect to the firmware. In some software is also connect to the middleware. So some middleware is nit a firmware.

Firmware:

It is form of micro code or programme embedded in to hardware. Because it is on the top of the system programming. which is help to connect … cameras, scanner, mobole phone, printers,tv remote relay.. etc. Because it is built in to the memory and to function smoothly. Write by low-level (machine level) functions. the firmware is software run on the micro controller.micro controller means system- on- chip

The article "Guest Role of Computer" by S. Mohan, published in the International Journal of Innovative Research in Technology (Vol. 11, Issue 7, December 2024), explores the foundational role of firmware and middleware in enabling computers to function as guest devices.



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Multifaceted properties of Ni and Zn codoped MgO nanoparticles

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Recent advancements in material science have aimed to create novel nanomaterials with unique properties and potential applications across diverse domains. By deciphering the complexities of the versatile nanomaterial, MgO, the study aims to deepen our comprehension of the synergistic effects induced by dual doping in MgO, thus propelling the advancement of innovative technologies and materials with broad applications. The present investigation employed a facile chemical precipitation and coprecipitation approach to synthesize pure MgO and Ni, Zn dual doped MgO, varying Ni concentration ranging between 2% and 10% and maintaining a constant Zn concentration at 20%. Structural and optical properties were investigated using field emission scanning electron microscope, energy dispersed X-ray analysis, powder X-ray diffraction, absorption spectra, besides photoluminescent analysis. Crystallite size, strain value then dislocation density of the samples were estimated by Scherrer equation and Williamson-Hall method. Tauc plot analysis revealed that codoped samples reduces the bandgap of MgO. The PL emission spectra exhibited a broad emission originating from various defect levels induced by Ni and Zn codoping in MgO. Ferromagnetism was also induced in Ni and Zn codoped samples with a saturation magnetization up to 5.4668 × 10^{-3} emu for 10%Ni–20%Zn doped MgO. The antibacterial studies were carried out and all samples were effective against the *Staphylococcus aureus* strain (ATCC 25923). This thorough investigation highlights the multidimensional impact of Ni, Zn dual doping on the characteristics of MgO nanoparticles, offering valuable insights for diverse applications in materials research.

Keywords Coprecipitation, Nanoparticles, Doped MgO, Bandgap tuning, Antibacterial study

Materials with sizes between 1 and 100 nanometers are known as nanoparticles, and they have attracted a lot of attention because of their unusual and adjustable characteristics brought about by their size and higher surface area-to-volume ratio. Metal oxide nanoparticles garnered significant interest from researchers due to their distinct and valuable properties[1–3]. Magnesium oxide nanoparticles stand-out among the various types of nanoparticles due to their intrinsic stability, wide bandgap, besides multifunctional properties. To improve and tune their properties, many researchers have investigated procedures such as doping, codoping and alloying, which involve injecting impurities or new elements into the crystal lattice[4]. Though defects are considered faults in inorganic matrix, they can sometimes help producing beneficial material features such as optical, catalytic, magnetic, and energy conversion[5–8]. The extraordinary optical, magnetic, and electrical properties of the wide gap insulator magnesium oxide with bandgap of 7.8 eV have attracted a lot of attention[10–14]. Owing to their distinct morphologies, magnesium oxide nanoparticles are recognised for their antibacterial, photocatalytic, and catalytic characteristics[15–17].

Doping involves the intentional incorporation of foreign elements into a material, altering its structural and electronic properties. On the other hand, codoping introduces two or more dopants simultaneously, leading to synergistic effects that can significantly modify the material's behaviour. In this study, a codoping strategy

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The article "Multifaceted properties of Ni and Zn codoped MgO nanoparticles" published in Scientific Reports (2024) investigates the structural, optical, magnetic, and antibacterial characteristics of magnesium oxide (MgO) nanoparticles doped with nickel (Ni) and zinc (Zn).

PATENT PUBLICATIONS BY FACULTY

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :18/02/2025

(21) Application No.202541014016 A
(43) Publication Date : 28/02/2025

(54) Title of the invention : CONTEXT-AWARE MACHINE LEARNING FRAMEWORK FOR PERSONALIZED RECOMMENDATIONS IN E-COMMERCE

(51) International classification :G06N0020000000, G06F0016953500, G06Q0030025100, H04N0021466000, H04N0021442000
(86) International Application No :NA Filing Date :NA
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA Filing Date :NA
(62) Divisional to Application Number :NA Filing Date :NA

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(57) Abstract :
The present invention relates to a context-aware machine learning framework for personalized recommendations in e-commerce. Existing recommendation systems rely on static models with limited adaptability to changing user preferences and real-time contextual factors. This invention overcomes these limitations by employing an adaptive learning approach that continuously refines recommendations based on multi-dimensional contextual data. The system comprises multiple interconnected modules like Data Acquisition Module (100) captures real-time user data, including browsing behavior, purchase history, session duration, location, device type, and external factors like seasonal trends. User Profiling and Feature Extraction (101) processes acquired data to generate dynamic user profiles, incorporating short-term and long-term behavioral patterns. Reinforcement learning algorithms (102) to analyze user preferences, predicts future interests, and adjusts recommendations dynamically. Personalized Recommendation Generator (103) generates tailored product suggestions by integrating real-time contextual insights and historical data. Feedback and Continuous learning (104) gives explicit and implicit feedback from user interactions to enhance recommendation accuracy through iterative updates. Multi-Source Data Fusion Module (105) aggregates information from internal and external sources, such as social media trends, product reviews, and competitor pricing, for improved relevance. This framework ensures highly personalized, real-time adaptive recommendations, improving user engagement and conversion rates. The invention supports scalability across different e-commerce platforms, optimizing product discovery and enhancing customer satisfaction.

No. of Pages : 13 No. of Claims : 6

The Patent Office Journal No. 09/2025 Dated 28/02/2025 21487

The Indian patent application (No. 20234104016 A, published on 28/02/2025) titled "Context-Aware Machine Learning Framework for Personalized Recommendations in E-Commerce" proposes an adaptive system to enhance recommendation accuracy and user engagement

The image outlines various tools available in a system, each serving a distinct function. These include tools for generating or editing images, searching the web for fresh and authoritative information, storing or deleting user memory facts, executing Python code for data visualization, and creating multiple-choice quizzes.

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :25/12/2024

(21) Application No.202441102956 A
(43) Publication Date : 03/01/2025

(54) Title of the invention : Enhancing Solar Cell Efficiency through Quantum Dot-Based Light Absorption and Charge Transport

(51) International classification :H01L0031180000, H01L0031035200, H01G0009200000, B82Y0020000000, H01L0031055000
(86) International Application No :NA Filing Date :NA
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA Filing Date :NA
(62) Divisional to Application Number :NA Filing Date :NA

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5)Mr. RAJA S
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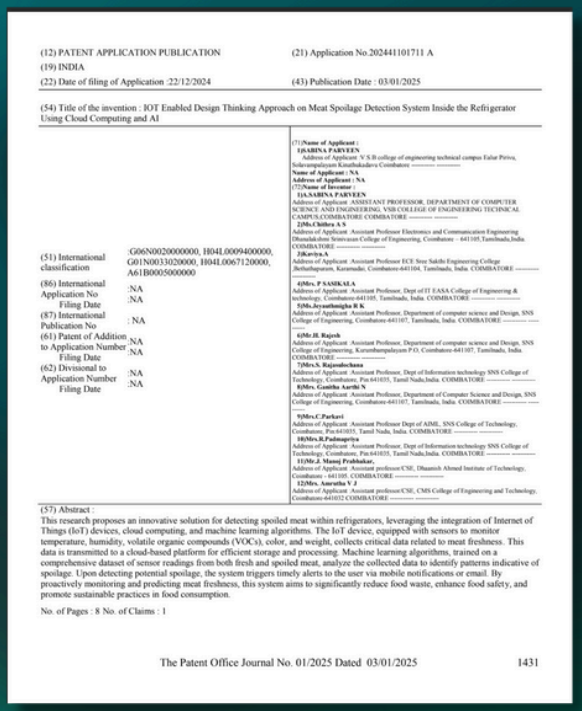
(57) Abstract :
Quantum dot semiconductors offer a promising pathway to significantly improve the efficiency of solar cells. Their unique properties, such as tunable bandgaps, broader light absorption, and the potential for multiple exciton generation, enable more efficient conversion of solar energy into electricity. This project explores the potential of quantum dots in enhancing solar cell efficiency by: Expanding Light Absorption: Utilizing quantum dots with varying sizes and compositions to absorb a wider range of the solar spectrum, including near-infrared wavelengths that are typically not captured by conventional silicon-based solar cells. Harnessing Multiple Exciton Generation: Leveraging the ability of quantum dots to generate multiple electron-hole pairs upon absorption of high-energy photons, thereby increasing the efficiency of solar energy conversion. Optimizing Charge Carrier Transport: Investigating and implementing strategies to minimize charge carrier recombination and facilitate efficient charge collection from quantum dots within the solar cell structure. This project aims to contribute to the development of next-generation high-efficiency solar cells by exploring the potential of quantum dot semiconductors and addressing the key challenges associated with their integration into solar cell devices.

No. of Pages : 8 No. of Claims : 1

The Patent Office Journal No. 01/2025 Dated 03/01/2025 1607



(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :22/12/2024

(21) Application No.202441101711 A
(43) Publication Date : 03/01/2025

(54) Title of the invention : IOT Enabled Design Thinking Approach on Meat Spoilage Detection System Inside the Refrigerator Using Cloud Computing and AI

(51) International classification :G06N0020000000, H04L0009400000, G01N0033020000, H04L0067120000, A61B00005000000
(86) International Application No :NA
Filing Date :NA
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

(71)Name of Applicant :
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Address of Applicant :Assistant Professor ECE Sree Sakthi Engineering College ,Bethathapuram, Karamadai, Coimbatore-641104, Tamilnadu, India. COIMBATORE ---------- ----------
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7)Mrs.S. Rajasulochana
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11)Mr.J. Manoj Prabhakar,
Address of Applicant :Assistant professor/CSE, Dhaanish Ahmed Institute of Technology, Coimbatore - 641105. COIMBATORE ---------- ----------
12)Mrs. Amrutha V J
Address of Applicant :Assistant professor/CSE, CMS College of Engineering and Technology, Coimbatore-641032 COIMBATORE ---------- ----------

(57) Abstract :
This research proposes an innovative solution for detecting spoiled meat within refrigerators, leveraging the integration of Internet of Things (IoT) devices, cloud computing, and machine learning algorithms. The IoT device, equipped with sensors to monitor temperature, humidity, volatile organic compounds (VOCs), color, and weight, collects critical data related to meat freshness. This data is transmitted to a cloud-based platform for efficient storage and processing. Machine learning algorithms, trained on a comprehensive dataset of sensor readings from both fresh and spoiled meat, analyze the collected data to identify patterns indicative of spoilage. Upon detecting potential spoilage, the system triggers timely alerts to the user via mobile notifications or email. By proactively monitoring and predicting meat freshness, this system aims to significantly reduce food waste, enhance food safety, and promote sustainable practices in food consumption.

No. of Pages : 8 No. of Claims : 1

The Patent Office Journal No. 01/2025 Dated 03/01/2025 1431

This Indian patent application (No. 20244110711 A), filed on 22 December 2024 and published on 3 January 2025, introduces an IoT-enabled system for detecting meat spoilage inside refrigerators using cloud computing and AI.

This Indian patent application (No. 202541018529 A), filed on 3 March 2025 and published on 14 March 2025, introduces a machine learning-based intrusion detection system designed to tackle imbalanced network traffic.

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application 03/03/2025

(21) Application No.202541018529 A
(43) Publication Date : 14/03/2025

(54) Title of the invention : A RANDOM FOREST APPROACH & PRINCIPAL COMPONENT ANALYSIS IN INTRUSION DETECTION SYSTEM USING MACHINE LEARNING

(51) International classification :H04L0009400000, G06N0020000000, G06N0003080000, G06N0009540000, G06F0018214000
(86) International Application No :NA
Filing Date :NA
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

(71)Name of Applicant :
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2)DR P.RAJU
Address of Applicant :VICE PRINCIPAL, V.S.B COLLEGE OF ENGINEERING TECHNICAL CAMPUS,COIMBATORE. COIMBATORE ---------- ----------
3)DR T.KALAIKUMARAN
Address of Applicant :PROFESSOR,HEAD OF THE DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING, V.S.B COLLEGE OF ENGINEERING TECHNICAL CAMPUS,COIMBATORE. COIMBATORE ---------- ----------
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6)K.SIVASELVI
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(57) Abstract :
In the realm of imbalanced network traffic, identifying malicious cyber-attacks poses a complex challenge due to their adept concealment within vast amounts of normal data. The complexity inherent in the stealth and obfuscation tactics within cyberspace poses a formidable challenge for Network Intrusion Detection Systems (NIDS), underscoring the need for precise and timely detection. Our objective is to leverage machine learning (ML) and deep learning (DL) algorithms for effective intrusion detection in imbalanced network traffic, employing the innovative Difficult-Set Sampling Technique (DSSTE) algorithm to address class imbalance. DSSTE begins with the Edited Nearest Neighbour (ENN) algorithm, segregating the imbalanced training set into challenging and uncomplicated sets. The subsequent application of the Kmns algorithm strategically compresses the majority of samples within the challenging set, diminishing the dominance of the prevailing class. To enhance dataset sophistication, continuous attributes of minority samples transform using zoom-in and out techniques, intelligently synthesizing new samples and augmenting the minority class. The algorithm amalgamates the easy set, compressed majority set, and augmented minority set to create a new training set, rectifying the imbalance and providing targeted data augmentation for the minority class. Validation of the method will unfold through planned experiments on intrusion datasets NSL-KDD and CIC-IDS2017. Classical models like Random Forest, Support Vector Machine, XG Boost, LSTM, Alex Net, and Mini-VGG net will be compared against 24 alternative methods, aiming to underscore the efficacy of DSSTE in enhancing classification performance. We aim to delineate a distinctive and effective trajectory for intrusion detection in imbalanced network traffic, with the aspiration of pushing the boundaries of contemporary detection systems.

No. of Pages : 9 No. of Claims : 1

The Patent Office Journal No. 11/2025 Dated 14/03/2025 26220

DESIGN BY FACULTY

पेटेंट कार्यालय, भारत सरकार The Patent Office, Government Of India

डिजाइन के पंजीकरण का प्रमाण पत्र | Certificate of Registration of Design

डिजाइन सं. / Design No. : 432460-001

तारीख / Date : 01/10/2024

पारस्परिकता तारीख / Reciprocity Date* :

देश / Country :

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो *AI-BASED WASTE DETECTION AND FILTRATION DEVICE FOR SEA AND RIVER* से संबंधित है, का पंजीकरण, श्रेणी 23-01 में 1.Mrs. A. Sabina Parveen 2. Mr.S.Ravi Raj 3.Dr.P.Raju 4.Dr.T.Kalaikumaran 5.Mr. Raja S के नाम से उपर्युक्त संख्या और तारीख से कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class 23-01 in respect of the application of such design to *AI-BASED WASTE DETECTION AND FILTRATION DEVICE FOR SEA AND RIVER* in the name of 1.Mrs. A. Sabina Parveen 2. Mr.S.Ravi Raj 3.Dr.P.Raju 4.Dr.T.Kalaikumaran 5.Mr. Raja S.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्यधीन प्रावधानों के अनुसरण में।

In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

This document is an official Certificate of Registration of Design issued by The Patent Office, Government of India, under the Designs Act, 2000 and Designs Rules, 2001. It certifies the registration of a design titled "AI-Based Waste Detection and Filtration Device for Sea and River" under Class 23-01, bearing Design No. 432460-001 dated 01/10/2024. The design is registered in the names of Mrs. A. Sabina Parveen, Mr. S. Ravi Raj, Dr. P. Raju, Dr. T. Kalaikumaran, and Mr. Raja S. The certificate confirms legal recognition and protection of the design, with an annexed copy and official seals validating its authenticity.

This Certificate of Registration of Design, issued by The Patent Office, Government of India, confirms the official registration of a design titled "Biometric Encrypted Portable Storage Drive" under Class 14-02, with Design No. 443548-001 dated 08/01/2025. The design is registered in the names of Dr. P. Rajendran, N. M. Indumathi, Dr. P. Anitha, K. Saranya, G. Priyadharshini, W. Hepzibah Jebaselvi, K. Meiyalakkan, and N. Sarmilaidevi. Granted under the provisions of the Designs Act, 2000 and Designs Rules, 2001, the certificate bears the official seal and signature of the Controller of Designs, affirming its legal validity and recognition

पेटेंट कार्यालय, भारत सरकार The Patent Office, Government Of India

डिजाइन के पंजीकरण का प्रमाण पत्र | Certificate of Registration of Design

डिजाइन सं. / Design No. : 443548-001

तारीख / Date : 08/01/2025

पारस्परिकता तारीख / Reciprocity Date* :

देश / Country :

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो *BIOMETRIC ENCRYPTED PORTABLE STORAGE DRIVE* से संबंधित है, का पंजीकरण, श्रेणी 14-02 में 1.Dr. P. Rajendran 2. N. M. Indumathi 3.Dr. P. Anitha 4.K. Saranya 5.G. Priyadharshini 6.W. Hepzibah Jebaselvi 7.K. Meiyalakan 8.N. Sarmiladevi के नाम से उपर्युक्त संख्या और तारीख से कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class 14-02 in respect of the application of such design to *BIOMETRIC ENCRYPTED PORTABLE STORAGE DRIVE* in the name of 1.Dr. P. Rajendran 2. N. M. Indumathi 3.Dr. P. Anitha 4.K. Saranya 5.G. Priyadharshini 6.W. Hepzibah Jebaselvi 7.K. Meiyalakan 8.N. Sarmiladevi.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्यधीन प्रावधानों के अनुसरण में।

In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

CERTIFICATES BY FACULTIES

R P Sarathy
Institute of Technology
An Autonomous Institution
Approved by AICTE | Accredited By NAAC A++ | Affiliated to Anna University

CERTIFICATE OF PARTICIPATION

This Certificate Is Proudly Presented To :

Dr S V DIVYA

Computer Science and Engineering

V S.B College of Engineering Technical Campus

has actively participated in the One Day Free Online FDP on "Data Science Using Python" Organized by Department of Computer Science and Engineering, R P Sarathy Institute of Technology (An Autonomous Institution), Salem, Tamilnadu in association with Pencil Bitz on 15 February 2025.

Dr. R.Vasanthi
HOD/CSE

Dr. Munusami Viswanathan
Principal

Sangeetha Subramaniam
Founder & CEO Pencil bitz

Dr. S V Divya from the Computer Science and Engineering department of V.S.B College of Engineering Technical Campus received a Certificate of Participation for actively attending a One Day Free Online Faculty Development Program (FDP) on "Data Science Using Python."

Mrs. T. Hemalatha, Assistant Professor in the CSE department of VSB College of Engineering Technical Campus, Coimbatore, participated in the "Seminar on AI for Teaching and Learning" held on 26 December 2024.

Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
DEEMED TO BE UNIVERSITY
University with Graded Autonomy Status
(An ISO 21001 : 2018 Certified Institution)
Periyar E.V.R. High Road, Maduravoyal, Chennai-95, Tamilnadu, India.

CERTIFICATE OF PARTICIPATION

This is to certify that Mrs.T.HEMALATHA , ASSISTANT PROFESSOR / CSE of VSB COLLEGE OF ENGINEERING TECHNICAL CAMPUS COIMBATORE has participated in the "Seminar on AI for Teaching and Learning" organised by The Internal Quality Assurance Cell, Dr.M.G.R.Educational and Research Institute on 26/12/2024.

Dr. N. Kanya
IQAC i/c

Dr. Malini Pande
Director -IQAC & ASC

Dr.C.B. Palanivelu
Registrar

Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
DEEMED TO BE UNIVERSITY
University with Graded Autonomy Status
(An ISO 21001 : 2018 Certified Institution)
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CERTIFICATE OF PARTICIPATION

This is to certify that Mrs.B. SUBHASHREE, ASSISTANT PROFESSOR / CSE of VSB COLLEGE OF ENGINEERING TECHNICAL CAMPUS COIMBATORE has participated in the "Seminar on AI for Teaching and Learning" organised by The Internal Quality Assurance Cell, Dr.M.G.R.Educational and Research Institute on 26/12/2024.

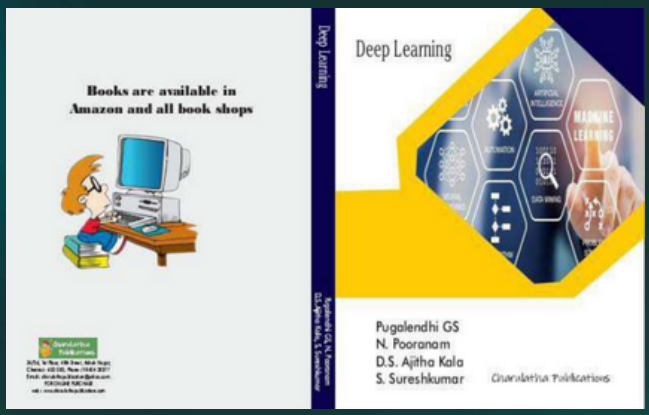
Dr. N. Kanya
IQAC i/c

Dr. Malini Pande
Director -IQAC & ASC

Dr.C.B. Palanivelu
Registrar

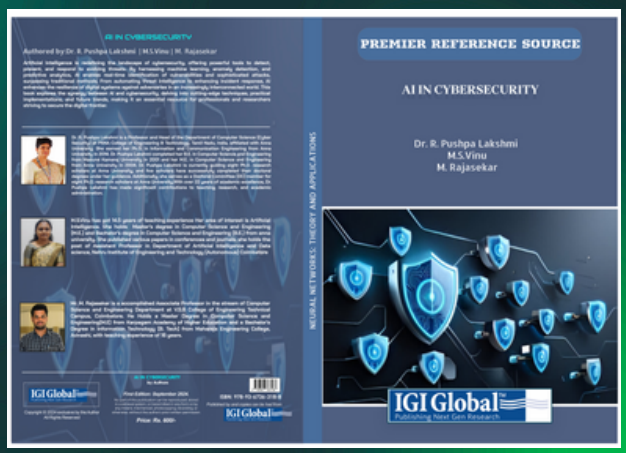
Mrs. B. Subhashree, Assistant Professor in the CSE department at VSB College of Engineering Technical Campus, Coimbatore, participated in the "Seminar on AI for Teaching and Learning" held on 26 December 2024.

BOOK PUBLICATION BY FACULTY



The book titled "Deep Learning" is authored by Pugalendhi GS, N. Pooranam, D.S. Ajitha Kala, and S. Sureshkumar, and published by Charulatha Publications. Its front cover features a modern digital design with hexagonal icons representing key concepts such as Artificial Intelligence, Machine Learning, Automation, Data Mining, and Deep Learning, alongside a hand interacting with the interface.

The book "AI in Cybersecurity" is authored by Dr. R. Pushpa Lakshmi, M.S. Vinu, and M. Rajasekar, and published by IGI Global as part of its Premier Reference Source series. It explores how artificial intelligence technologies like machine learning and deep learning are transforming cybersecurity through applications in threat detection, malware analysis, intrusion detection, and network protection, while also addressing ethical challenges. Designed for researchers, professionals, and students, the book offers a comprehensive overview of AI-driven security solutions. The authors are experienced faculty members from Panimalar Engineering College, Chennai, with extensive teaching, research, and publication credentials in AI and cybersecurity.



FDP PARTICIPATION BY FACULTIES

ATAL/2025/1739872002

Skill India

ATAL

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

Nelson Mandela Marg, Vasant Kunj, New Delhi -110070

AICTE Training and Learning (ATAL) Academy

Certificate

It is certified that ***Dr. S V Divya, Faculty members of the AICTE approved institutions*** *of* ***V.S.B College of Engineering Technical Campus*** *has successfully participated & completed AICTE Training And Learning (ATAL) Academy Faculty Development Program on* ***Sustainable Carbon-Free Technologies for Hydrogen Generation and Storage*** *at* ***National Institute of Technology Tiruchirappalli*** *from* ***24/02/2025*** *to* ***01/03/2025.***

Annad Ramanathan
Professor (Other Institute), Coordinator
National Institute of Technology Tiruchirappalli

Dr. Sunil Luthra
Director & Bureau Head
Training and Learning Bureau, AICTE

Dr. S V Divya, a faculty member of V.S.B College of Engineering Technical Campus, successfully completed the AICTE Training and Learning (ATAL) Academy Faculty Development Program on "Sustainable Carbon-Free Technologies for Hydrogen Generation and Storage.

Mrs. Ananthalakshmi C G, Assistant Professor at VSB College of Engineering Technological Campus, Coimbatore, successfully participated in the AICTE Training and Learning (ATAL) Academy Faculty Development Program on "Quantum Computing – Research Perspective in Healthcare Applications."

ATAL/2024/1734166903

Skill India

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ALL INDIA COUNCIL FOR TECHNICAL EDUCATION

Nelson Mandela Marg, Vasant Kunj, New Delhi -110070

AICTE Training and Learning (ATAL) Academy

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It is certified that ***Mrs. Ananthalakshmi C G, Assistant Professor*** *of* ***VSB College of Engineering Technological Campus, Coimbatore*** *has successfully participated & completed AICTE Training And Learning (ATAL) Academy Faculty Development Program on* ***Quantum Computing – Research Perspective in Healthcare Applications*** *at* ***P.S.R. Engineering College*** *from* ***16/12/2024*** *to* ***21/12/2024.***

K.Valarmathi
Professor (Other Institute), Coordinator
P.S.R. Engineering College

Dr. Sunil Luthra
Director & Bureau Head
Training and Learning Bureau, AICTE

NPTEL BY STUDENTS

NPTEL ONLINE CERTIFICATION

(Funded by the MoE, Govt. of India)

Skill India

This certificate is awarded to

S ROSHINI

for successfully completing the course

Data Base Management System

with a consolidated score of 45 %

Online Assignments	15.21/25	Proctored Exam	30/75

Total number of candidates certified in this course: 8423

Jan-Mar 2025

(8 week course)

Prof. Haimanti Banerji

Coordinator, NPTEL

IIT Kharagpur

Indian Institute of Technology Kharagpur

swayam

Roll No: NPTEL25CS18S645100444 To verify the certificate No. of credits recommended: 2 or 3

S Roshini successfully completed the NPTEL online certification course on "Data Base Management System" offered by IIT Kharagpur from January to March 2025.

NPTEL ONLINE CERTIFICATION

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Skill India

This certificate is awarded to

VASUNTHRAA G

for successfully completing the course

Data Base Management System

with a consolidated score of 51 %

Online Assignments	21.04/25	Proctored Exam	30/75

Total number of candidates certified in this course: 8423

Jan-Mar 2025

(8 week course)

Prof. Haimanti Banerji

Coordinator, NPTEL

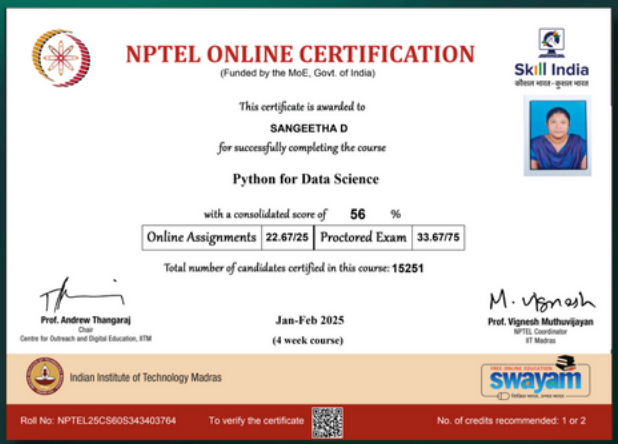
IIT Kharagpur

Indian Institute of Technology Kharagpur

swayam

Roll No: NPTEL25CS18S645100484 To verify the certificate No. of credits recommended: 2 or 3

VASUNTHRAA G successfully completed the NPTEL online certification course on "Data Base Management System" conducted by IIT Kharagpur from January to March 2025.



NPTEL ONLINE CERTIFICATION

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Skill India

This certificate is awarded to

SANGEETHA D

for successfully completing the course

Python for Data Science

with a consolidated score of 56 %

Online Assignments	22.67/25	Proctored Exam	33.67/75

Total number of candidates certified in this course: 15251

Prof. Andrew Thangaraj

Chair

Centre for Outreach and Digital Education, IITM

Jan-Feb 2025

(4 week course)

Prof. Vignesh Muthuvijayan

NPTEL Coordinator

IIT Madras

Indian Institute of Technology Madras

swayam

Roll No: NPTEL25CS60S343403764 To verify the certificate No. of credits recommended: 1 or 2

SANGEETHA D successfully completed the NPTEL online certification course titled "Python for Data Science," conducted by IIT Madras from January to February 2025.

ONLINE CERTIFICATES BY STUDENTS


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COURSE COMPLETION CERTIFICATE

The certificate is awarded to

LIGETH .V

for successfully completing the course

Fundamentals of the C Language: Variables & Datatypes

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Ligeth V successfully completed the Infosys Springboard course titled "Fundamentals of the C Language: Variables & Datatypes" on 9 February 2025

Haritha Haritha successfully completed the Infosys Springboard course titled "Financial Literacy" on 9 February 2025.


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Haritha Haritha

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Executive Vice President and Global Head
Education, Training & Assessment (ETA)
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The certificate is awarded to

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for successfully completing the course

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Issued on: Sunday, February 9, 2025
To verify, scan the QR code at https://verify.onwingspan.com

Thirumala Arohi
Executive Vice President and Global Head
Education, Training & Assessment (ETA)
Infosys Limited

Jacqueline L successfully completed the Infosys Springboard course titled "Financial Literacy" on 9 February 2025.

Pragalathan g has successfully completed the "Basics of Python" course offered by Infosys through its Springboard platform on January 16, 2025


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COURSE COMPLETION CERTIFICATE

The certificate is awarded to

Pragalathan ggg

for successfully completing the course

Basics of Python

on January 16, 2025

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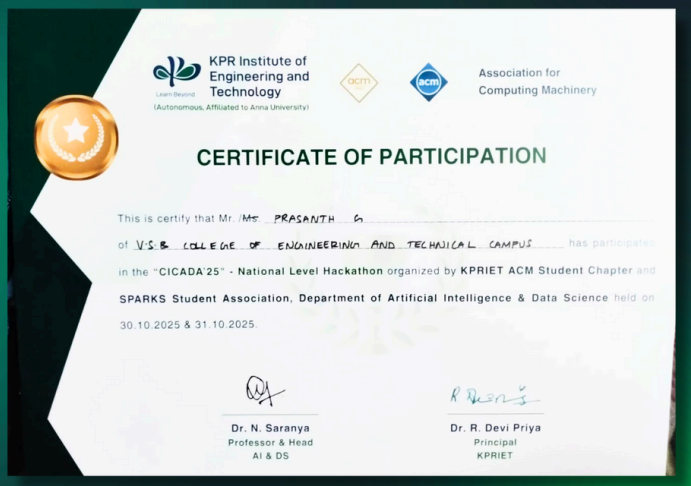
Thirumala Arohi
Executive Vice President and Global Head
Education, Training & Assessment (ETA)
Infosys Limited

OUTSIDE COLLEGE EVENTS

KalaiVani M from V.S.B. College of Engineering Technical Campus participated in the Tech Event–J-LEAGUE, which was part of Sri Eshwar THIRAN 2025—a national-level inter-college technical, cultural, and sports fest

Prasanth G from V.S.B College of Engineering and Technical Campus participated in "CICADA'25," a National Level Hackathon held on 30 and 31 October 2025.



Kalaivani M from V.V.S.B. College of Engineering Technical Campus participated in the Tech Event–J-LEAGUE, held as part of Sri Eshwar THIRAN 2025, a national-level inter-college technical, cultural, and sports fest

Ms. Sree Gayathree R from VSB College of Engineering Technical Campus participated in the five-day workshop titled "HACKSTACK'25

WEBINAR

The Department of Computer Science and Engineering at V.S.B. College of Engineering Technical Campus, Coimbatore, organized a webinar titled “Navigating Intellectual Property Rights: Strategies for Protection and Innovation” on March 20, 2025, at 2:00 PM. The session was led by Amita Arora from Anand and Anand, Noida, India, and focused on practical approaches to safeguarding intellectual property and fostering innovation.

V.S.B. College of Engineering Technical Campus, Coimbatore, organized a webinar titled “Strategies for Startup Success” on March 3, 2025, at 3:30 PM. Hosted by the Institution’s Innovation Council (IIC) in collaboration with the Department of Computer Science and Engineering, the session featured Tamil Selvan Kandasamy, Senior DevOps Engineer, APAC – Bengaluru, as the speaker. The event focused on practical strategies for launching and sustaining startups

EDITORIAL TEAM

Faculty Team:
1.Mrs.V.Radha, HOD/CSE
2. Mr.M.Bharathi Raja, AP/CSE

Students Team(III Year):
1. Kavin
2. Naveen
3. Monisha

Students Team(IV Year):
1. Eshwar Kumar
2. Dhanush
3.Arul

Thank you!