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Journal Abstracts

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Sl. No	Article	Author	Source	Year
1	Interplanetary Magnetic Field -Solar Wind Coupling and Geomagnetic Response during Solar Cycles 23,24 and 25	<i>Chandrasekhar Bhoj</i>	Indian Journal of Pure & Applied Physics Vol:64 No:6	2026

Abstract: The present study investigates the variation in the geomagnetic storms, measured by Dst and Kp indices (with Kp scaled as $Kp \times 10$ for consistency) in relation to the southward component of the interplanetary magnetic field (IMF) Bz component, solar wind speed (V) and the product of the solar wind speed V and IMF Bz for the three consecutive solar cycles (SCs) 23, 24 and the rising phase of SC 25. The study enhances understanding of the dependency of geomagnetic activities on interplanetary parameters. From this study it is found that the product of V and Bz as the most geoeffective parameter and produces significant disturbance in Earth's magnetospheric conditions compared to V or Bz alone, this is because when solar wind speed V combines with southward magnetic field (Bz) it enhances the magnetic reconnection due to which plasma flow speed suddenly increases and the induced electric field swaps the charge particles, which enhances the geomagnetic activities. The study also determined the correlation coefficient between the Dst index and VBz for these three SCs, which are (0.7, 0.65 and 0.5), and between the Kp index and VBz is (-0.7, -0.65 and 0.55), respectively. The Kp index shows resemblance with the solar wind speed V, i.e. both these parameter reaches to its peak values corresponding to Dst minima. Furthermore, this study also investigated the variation of Dst and Kp index with solar wind speed V and IMF Bz separately and found that the correlation between these parameters is moderate across all three SCs. This suggests that solar wind speed (V) or IMF (Bz) alone is not sufficient to produce intense geomagnetic storms. Additionally, there is an average time lag of 1 to 2 days between Bz minima and Dst minima, which indicates a complex mechanism involved in magnetic reconnection between Earth's magnetosphere and IMF, the Dst and Kp indices found to vary inversely with respect to each other (during sharp dip in Dst Kp index reach to its peak value), also the geomagnetic activities during SC 23 and the rising phase of SC 25 is comparatively high and shows resemblance, which suggests the same kind of variation may also be expected for the SC 25 as that of SC 23 which helps in predicting space weather conditions.

Sl. No	Article	Author	Source	Year
2	Thermohydrodynamic Behavior of Nonlinear Slip Flow of Ternary Hybrid Nanofluid in Low and High Porosity Porous-Media: Applied to Packed Bed of Small Particles and Metal Foam	<i>B S Kamilla ,S Shaw , D N Thatoi, M K Nayak.</i>	Indian Journal of Pure & Applied Physics Vol:64 No:6	2026

Abstract: The present study aims at exploring thermohydrodynamic behavior of nonlinear slip flow of Ag + Al₂O₃ + Graphene +Water ternary hybrid nanofluid (THNF) in porous media, with applications to packed beds and metal foams. The motivation of this study to achieve a significant enhancement in thermal efficiency and heat transfer rates (HTRs) for advanced engineering applications. Compared to mono and binary nanofluids, these nanofluids provide better heat regulation and greater thermal conductivity by mixing Ag,Al₂O₃, graphene nanoparticles in a base fluid. Because it provides better heat transfer and flow stability than traditional fluids and binary hybrid nanofluids, this work is important for the design of high-efficiency thermal management systems. A 3D solution of transformed governing equations is obtained by using Galerkin in finite element method. Fluid velocity $f'(\eta)$ increases with rise in curvature parameter Ω while it whittles down with rise in slip parameter γ at low Reynolds number subject to uniform and linear heating in low porosity porous media (packed bed of small particles) and high porosity porous media (metal foam). Further, fluid temperature $\theta(\eta)$ for THNF is greater than that of hybrid nanofluid (HNF) in both boundary heating subject to both type of porous media.

Sl. No	Article	Author	Source	Year
3	Investigations of production cross sections of ^{122}I , ^{123}I , ^{124}I , ^{125}I , ^{126}I , ^{128}I produced in Te target by proton irradiation	<i>Pawan Kumar, Sneh Lata Goyal.</i>	Indian Journal of Pure & Applied Physics Vol:64 No:6	2026

Abstract: The excitation functions of proton-induced (p, n) reactions on stable tellurium isotopes (^{122}Te , ^{123}Te , ^{124}Te , ^{125}Te , ^{126}Te , ^{128}Te) were investigated to evaluate their potential for producing medically important iodine radionuclides. Theoretical calculations were performed using the nuclear reaction model codes TALYS-2.0 and EMPIRE-3.2.3 and compared with experimental cross section data from the EXFOR and ENDF databases. Both codes, employing different level density and pre-equilibrium approaches, were systematically assessed for predictive accuracy. The TALYS-2.0 generally reproduced the measured data more reliably across most isotopes, while EMPIRE yielded superior agreement for specific cases such as ^{124}I and ^{126}I production. Discrepancies between theoretical and experimental results underline the sensitivity of model parameters and the need for additional cross-section measurements, particularly in poorly explored energy regions. These findings highlight the importance of accurate nuclear data in refining reaction models and optimizing cyclotron-based production routes for radioiodine used in diagnostic and therapeutic applications.

Sl. No	Article	Author	Source	Year
4	EHD-Net: A Hybrid Approach to Brain Tumor Segmentation in MRI Using U-Net Transformer Architecture with Double Attention	<i>Gopal Krishan Prajapat, Dharmendra Yadav</i>	Indian Journal of Pure & Applied Physics Vol:64 No:6	2026

Abstract: Accurate segmentation of brain tumours from magnetic resonance imaging (MRI) plays a crucial role in diagnosis, treatment planning, and follow-up. EHD-Net (Efficient Hybrid Double-Attention Network) is proposed as a hybrid architecture that combines the strengths of convolutional and Transformer-based approaches while maintaining computational efficiency.

The model employs an optimized U-Net backbone with depth wise separable convolutions to reduce parameters, a 3D Contextual Transformer (CoT) at the bottleneck to capture long-range dependencies, and lightweight Double Attention (DA) modules in skip connections to refine local boundaries. Trained and evaluated on the BraTS 2021 dataset with multimodal MRI sequences (T1, T1ce, T2, FLAIR), EHD-Net achieves state-of-the-art performance with an average Dice Similarity Coefficient (DSC) of 93.2 % (95.1 % WT, 92.4 % TC, 92.0 % ET), IoU of 85.1 %, HD95 of 5.5 mm, and MSD of 1.2 mm. Importantly, EHD-Net delivers the fastest inference among the compared models, with an average processing time of 9 seconds per MRI volume, making it suitable for near real-time clinical deployment. These results highlight EHD-Net as an effective, robust, and efficient solution for brain tumor segmentation in multimodal MRI, bridging the gap between high accuracy and practical usability in clinical workflows.

Sl. No	Article	Author	Source	Year
5	Iterative Chi-Square Minimization for Gamma Ray Spectrometry: Quantifying K, U and Th concentrations in Geological Samples	<i>Ankur Trivedi, H B Shrivastava, Uday Kumar, G K Sharma, R K Mondal, N K Johri, S K Dash</i>	Indian Journal of Pure & Applied Physics Vol:64 No:6	2026

Abstract: Gamma ray spectrometry is widely employed for quantifying naturally occurring radioactive elements such as potassium (K), uranium (U) and thorium (Th) in geological materials, however, conventional energy window-based analysis (EWBA) is constrained by spectral overlap and simplified treatment of counting uncertainties. In this study, an iterative chi-square minimization (ICSM) algorithm with adaptive uncertainty refinement is implemented in Python to perform full spectrum analysis of NaI(Tl) gamma ray spectra over the energy range 0.4–2.9 MeV. Standard spectrum from International Atomic Energy Agency (IAEA) Standard Reference Materials (SRMs) and a calibrated $5^2 \times 4^2$ NaI(Tl) detector are used to determine isotopic concentrations and their uncertainties in a sample spectrum. Elemental response functions derived from reference standards are used to model measured spectra as linear combinations of K, U, and Th contributions, while channel wise uncertainties are iteratively updated based on the expected (fitted) spectrum. The method is applied to geological samples and to three in-house certified reference materials (CRMs)

analyzed as unknowns. For the samples, ICSM consistently yields lower uncertainties than EWBA for identical counting times, with typical uncertainty reductions of approximately 1.3–1.8 x for K, 2–3 x for U, and 1.5–2.5 x for Th. The in-house standards, having concentrations independently determined using a high purity germanium (HPGe) detector, provide an external validation of quantitative performance. ICSM derived concentrations exhibit closer agreement with HPGe reference values and substantially reduced uncertainties compared with EWBA. Residual analysis and reduced chi-square values indicate statistically consistent fits across all analyzed spectra. These results demonstrate that iterative chi-square minimization with adaptive uncertainty refinement offers a precise and statistically robust alternative to window based methods for quantitative gamma ray spectrometric analysis of geological materials.

Sl. No	Article	Author	Source	Year
6	Determination of the Critical Exponent for High Temperature Superconductors Using Paraconductivity Approach	<i>M A Islam, M R Islam</i>	Indian Journal of Pure & Applied Physics Vol:64 No:6	2026

Abstract: Theoretical ideas are developed to determine the critical exponent, understanding superconductivity for high-temperature superconductors. A detailed analysis is given based on the paraconductivity approach and compared with the experimental results. To develop the theoretical idea, the analysis is performed with the help of well-known paraconductivity expressions. To match the theoretical idea with experimental value, we have reproduced the data points using the 'OriginPro' software. Numerical estimation has been given in favour of the samples $Tl_2Ba_2CaCu_2O_8$ (TBCCO), $Bi_{1.6}Pb_{0.4}Sr_2Ca_2Cu_3O_x$ (BSCCO), (YBCO) and (SmBCO). The theoretical models largely agreed with the experimental results for the mentioned superconducting samples.

Sl. No	Article	Author	Source	Year
7	Design and Validation of a Compact Printed Antenna for 2.4 GHz WLAN Applications with USB Wi-Fi Dongle Integration	<i>Amit Birwal, Ambresh P A, Rajesh Singh</i>	Indian Journal of Pure & Applied Physics Vol:64 No:6	2026

Abstract: This work presents a compact low profile printed antenna useful for operation in the 2.4 GHz Wireless local area network (WLAN) band. The antenna is fabricated on an FR4 substrate, which provides a low-cost platform suitable for practical communication systems. The dimensions for initial antenna were obtained using conventional microstrip antenna design equations and were later optimized through parametric simulations available in CST Microwave Studio. The importance of main geometrical parameters was investigated to obtain improved impedance matching at the resonance frequency. An antenna prototype was fabricated using a PCB etching process and measured using vector network analyzer. The antenna has a measured return loss of approximately -38 dB at 2.45 GHz, a bandwidth of about 350 MHz ($VSWR \leq 3$), and a measured gain of 2.2 dBi. The measured reflection coefficient (S11) shows a good agreement with the simulated results, which confirms that the antenna resonates at 2.45 GHz with acceptable bandwidth and stable radiation characteristics. To check the antenna performance for practical applications, it was integrated with a commercially available USB Wi-Fi dongle connected to a laptop, the received signal (in dBm) strength was monitored using a laptop and a hotspot-enabled mobile phone is used as the wireless source. The measurement results prove that a reliable wireless connectivity link is established under both short-range and long-range conditions. These results indicate that the proposed antenna not only provides a simple structure but also suitable for practical solution useful for compact portable wireless communication systems.

Sl. No	Article	Author	Source	Year
8	Antibunching of Light in Coherent Anti-Stokes Hyper Raman Scattering	<i>Priyanka, Simranjot Kaur, Jawahar Lal</i>	Indian Journal of Pure & Applied Physics Vol:64 No:6	2026

Abstract: This paper aims to study the photons antibunching in the fundamental, Stokes and signal modes of CAHRS (coherent anti-Stokes hyper Raman scattering). The generalized interaction Hamiltonian was calculated for different conditions in the Heisenberg picture under short time approximation to observe photons antibunching in the fundamental, Stokes and signal modes of CAHRS. It has been found that antibunching in the fundamental field is dependent upon interaction time, photons number, and coupling strength of field. Third order photon antibunching is found to be nonclassical to a greater extent than second- and first-order photon antibunching for the identical pump photons count. It has been also observed that the effect of photon antibunching in Stokes and signal modes is less prominent than in the fundamental- mode. Furthermore, it is also found that antibunching will increase at short interaction times with the increase of depth of nonclassical behavior. Finally, the extent of photons antibunching peaks precisely where the second correlation function is lowest.

Sl. No	Article	Author	Source	Year
9	Enhanced RF Performance Using Trench-Based Junctionless FET: Design and Analytical Study	<i>Manoj Singh Adhikari, Raju Patel, Chandramauleshwar Roy, Yogesh Kumar Verma, Manoj Kumar Shukla</i>	Indian Journal of Pure & Applied Physics Vol:64 No:6	2026

Abstract: To enhance the analog/RF performance, a dual-channel trench based junctionless FET (JLT) is being proposed. The planned structure's gate is set in a vertical trench, with two channels cut out on either side of it. HJLT and MJLT, the heavily and moderate doped drain concentrations for the suggested device, are explored correspondingly. The devices' performance parameters are assessed and contrasted with respect to drain current (ID), unity-gain cut-off frequency (ft), transconductance (gm), and maximal oscillation frequency (fmax) in a TCAD tool (ATLAS) through 2D numerical simulations. As a result, the suggested

topology makes sense for analog and radio frequency applications. At 20 nm gate length, the proposed HJLT is shown to provide f_{max} , f_T , and peak g_m of, 2300 GHz, 580 GHz, and 2710 $\mu S/\mu m$ respectively. As a result, the suggested topology makes sense for analog and radio frequency applications.

Sl. No	Article	Author	Source	Year
10	Physical and Dielectric Properties of Polycrystalline $LaV_{0.5}Nb_{0.5}O_4$	<i>Ashok Kumar, Simranjot K Sapra, Ramcharan Meena, Vinod Singh, Anita Dhaka, Rajendra Dhaka</i>	Indian Journal of Pure & Applied Physics Vol:64 No:6	2026

Abstract: A detailed investigation of the structural, electronic, vibrational, and dielectric properties of polycrystalline $LaV_{0.5}Nb_{0.5}O_4$ samples, prepared at two sintering temperatures (1000 $^{\circ}$ C and 1250 $^{\circ}$ C). The introduction of Nb^{5+} at the V^{5+} site leads to notable structural and vibrational changes, which can be attributed to their isoelectronic nature and the larger ionic radius of Nb^{5+} . The Rietveld refinement of the X-ray diffraction patterns confirms a coexistence of monoclinic ($P2_1$) and scheelite-type tetragonal ($I4_1/a$) phases; for example, with a fraction of 4% and 96% for the sample annealed at 1250 $^{\circ}$ C. The particle morphology has altered from spherical (1000 $^{\circ}$ C) to irregular-shaped (1250 $^{\circ}$ C) because of increase in annealing temperature. The Raman spectroscopy, Fourier Transform Infrared spectroscopy and X-ray Photoemission Spectroscopy have been used to understand the vibrational and electronic properties. An optical band gap of 2.7~eV for the sample sintered at 1250 $^{\circ}$ C is calculated using Ultraviolet-vis diffuse reflectance spectroscopy measurements. The dielectric studies show the higher dielectric permittivity (ϵ_r) and lower dielectric loss for the sample annealed at 1250 $^{\circ}$ C.

Sl. No	Article	Author	Source	Year
1	Artificial Intelligence in Personal Finance: Implications for Sustainable Financial Behavior	<i>Yuvaraj Halage and Bharathkumar K K</i>	The IUP Journal of Management Research Vol:25 No:2	2026

Abstract: The study examines how AI-based personal finance tools influence financial behaviors such as budgeting, saving, and spending discipline and the extent to which they support sustainable financial choices. A structured survey was conducted among 384 urban digital banking users in India, capturing data on tool usage, behavioral outcomes, and sustainability-related decisions. Structural equation modeling was applied to assess the proposed relationships, and the results indicated that active engagement with AI-powered financial tools significantly improves financial discipline, fostering greater control over expenditure, systematic saving habits, and adherence to planned budgets. These behavioral improvements contribute to sustainability-focused financial decisions, including long-term investment planning and consideration of social and environmental factors in financial choices. Moreover, AI tool usage demonstrates a direct positive effect on sustainable decision-making, suggesting that advanced features such as personalized insights, predictive analytics, and ESG-based recommendations can encourage responsible financial conduct even without intermediary behavioral changes.

Sl. No	Article	Author	Source	Year
2	An Investment-Normalized Sustainability Efficiency Analysis of Green Banking in India	<i>K Senthil Velan, Abhiraj Kulkarni, Chaitra Hebbar and Jayashree M</i>	The IUP Journal of Management Research Vol:25 No:2	2026

Abstract: The paper analyzes how green financial allocation generates measurable environmental outcomes, thereby evaluating sustainable performance beyond disclosure-oriented ESG indicators. For this purpose, it has developed a sustainability efficiency framework that evaluates how effectively green financial allocations generate measurable environmental outcomes. Using secondary data from Green Deposit Impact Reports of selected Indian banks, investment normalized indicators, such as carbon

efficiency, energy efficiency, and electric mobility impact efficiency, have been compared across project categories and institutions. The findings indicate substantial variation in sustainability efficiency, suggesting that higher financial allocation does not necessarily correspond to greater environmental impact.

Sl. No	Article	Author	Source	Year
3	Determinants of Purchase Decisions and Their Impact on Customer Experience in the Hair Care Industry	<i>Mallesh P, Anupama Sundar D and Pradeep M P</i>	The IUP Journal of Management Research Vol:25 No:2	2026

Abstract: The study examines how factors such as key purchasing attributes, price, packaging, and recommendation affect customer experience (CX), satisfaction, and brand loyalty in the hair care industry. A descriptive research design was adopted and data was collected from 400 respondents using a structured Likert scale questionnaire. Stratified random sampling ensured representation across diverse demographic groups. Analytical tools include descriptive statistics, factor analysis (KMO and Bartlett's test), reliability analysis, and regression (ANOVA). The findings confirm that recommendations, packaging and other attributes significantly influence purchase decisions. Recommendation is found to be the strongest predictor of CX, highlighting the importance of trust and perceived value. The study provides insights for improving customer satisfaction through better product features, transparent communication, competitive pricing, and effective use of customer reviews and endorsements, ultimately supporting long-term brand loyalty in a competitive market.

Sl. No	Article	Author	Source	Year
4	AI-Driven Personalization in Life Insurance: A Systematic Review of Gen Z Consumer Behavior	<i>Kunal Mitra Mustaphi and Lakshmi K S</i>	The IUP Journal of Management Research Vol:25 No:2	2026

Abstract: This systematic literature review examines the intersection of artificial intelligence (AI) and life insurance adoption among Gen Z, highlighting the impact of personalized digital experiences in shaping consumer behavior. Drawing from 42 studies published between 2015 and 2025, the review synthesizes key trends. The study analyzes how AI tools influence Gen Z's engagement with life insurance products. Unlike prior studies that focused either on digital finance broadly or AI's role in insurance narrowly, this study intersects both domains, examining behavioral tendencies, product adoption, trust mechanisms, and market specific patterns. The findings reveal that Gen Z exhibits strong preferences for speed, transparency, and personalization in their interactions with life insurance companies, and also notable gaps where AI drive can positively influence consumer behavior specially in emerging economies like India.

Sl. No	Article	Author	Source	Year
5	Agentic AI for ESG-Aligned Supply Chain Resilience in Apparel SMEs: A Multi-Agent Framework and Illustrative Simulation	<i>Kunal Mishra and Balaji Setty</i>	The IUP Journal of Management Research Vol:25 No:2	2026

Abstract: This study has developed a Value-Based Agentic AI Framework (VBAF) for risk management and ESG compliance in apparel small and medium enterprises (SMEs). A PRISMA 2020-guided systematic literature review synthesizing 93 peer-reviewed sources (2016-2025) was conducted. Thematic coding in NVivo 14, supplemented by VOSviewer bibliometric clustering, identifies seven research gaps: agentic autonomy, multi-agent coordination, risk sensing, ESG-value alignment, SME implementation barriers, digital infrastructure deficits, and theoretical fragmentation. VBAF embeds ESG utility constraints directly within agent decision functions through six design propositions calibrated to SME resource profiles. An illustrative NetLogo agent-based

simulation across 20 production ticks demonstrates VBAF achieving 92% on-time delivery against a reactive baseline of 68% under severe cascade disruption, with 18% reduction in simulated emissions and 75% mitigation of modeled shortfall events. The framework integrates Value-Sensitive Design, Socio-Technical Resilience Theory, and Resource Dependence Theory, offering a phased deployment roadmap operable within sub-\$2,000 monthly budgets.

Sl. No	Article	Author	Source	Year
6	Influence of Organizational Culture on Employee Engagement in Indian Hospitals: A Comparative Perspective	<i>Awantika Garg and Aditi Veda</i>	The IUP Journal of Management Research Vol:25 No:2	2026

Abstract: The correlation between organizational culture (OC) and employee engagement (EE) is becoming an evolving concept in the dynamic environment of healthcare institutions, contributing to their performance. This paper explores these dynamics in the context of Indian hospitals. The data was collected using a structured questionnaire from a sample of 150 clinical and non-clinical employees of selected government and private hospitals in Indore, Madhya Pradesh, India. The study investigated the effect of cultural dimensions on engagement outcomes, using t-tests, exploratory factor analysis (EFA), Pearson correlation, linear regression, and SPSS v26. The findings indicate that the level of engagement was significantly greater in private hospitals, facilitated by openness and recognition and decentralized decision making, while in public hospitals rigorous and hierarchical culture with regard to engagement and burnout was observed.

Sl. No	Article	Author	Source	Year
7	Exploring the Content Features of Vertical Video Marketing	<i>Astik Upadhyay and Aditi Naidu</i>	The IUP Journal of Management Research Vol:25 No:2	2026

Abstract: While vertical video marketing has become a key tactic in digital brand communication, the multidimensional structure of content features that influence consumer perception and engagement has been the subject of little empirical research. The present study uses exploratory factor analysis (EFA) to determine the underlying dimensions of vertical video marketing content. Active social media users were given a structured questionnaire that included several statements about format effectiveness, authenticity, convenience, production quality, emotional appeal, informational value, interactivity, and call-to-action effectiveness. Eight different factors were identified by the factor analysis results. When taken as a whole, these variables account for a significant amount of the variation in how consumers assess vertical video content. The study reveals that the effectiveness of vertical video marketing is multidimensional and depends not only on the vertical format but also on factors such as authenticity, storytelling, interactivity, emotional connection, and production quality. The identified eight dimensions provide a comprehensive framework for understanding consumer engagement and designing more impactful vertical video marketing strategies. By providing a validated dimensional framework of its content features, the findings advance theoretical understanding of vertical video marketing.

Sl. No	Article	Author	Source	Year
8	Impact of AI Technologies on Student Learning and Engagement in HEIs	<i>Rachana Jain, Aditi Veda and Pooja Verma</i>	The IUP Journal of Management Research Vol:25 No:2	2026

Abstract: The study examines the impact of AI technologies on student learning and engagement in higher education institutions (HEIs). It adopts a quantitative research approach, collecting data from 250 students through a structured questionnaire using a five-point Likert scale. The data was analyzed using SPSS (Version 25) with regression and ANOVA techniques. The results indicate

that AI technologies have a significant positive impact on both student learning (87.5%) and engagement (77.6%), with factors such as feedback, real-time interaction, and active participation emerging as key contributors, while the influence on critical thinking was found to be minimal.

Sl. No	Article	Author	Source	Year
9	Impact of Gender Diversity on Whistleblowing Intentions in IT Organizations	<i>Sowmya K and Rachana B T</i>	The IUP Journal of Management Research Vol:25 No:2	2026

Abstract: The study seeks to examine the relationship between gender diversity policies and whistleblowing behavior among male and female employees of MNCs operating in Bengaluru, Karnataka, India. A total of 182 responses were collected for the study. The results indicate a significant correlation, with female employees showing a stronger link between satisfaction with gender diversity policies and their likelihood of reporting unethical behavior. Key factors such as gender diversity valued at workplace, neutral career opportunities, promoting a culture of respect, equitable promotion opportunities, and companies' overall commitment to gender diversity were measured. For male employees, the relationship was positive but slightly weaker, suggesting a moderate influence of gender diversity policies on their whistleblowing actions. These findings highlight the importance of fostering gender diversity, respect, and inclusion in workplace culture to encourage ethical reporting behaviors across both genders.

Sl. No	Article	Author	Source	Year
1	Caste, Merit and Development: Challenges to Affirmative Action Claims in Indian Higher Education	<i>Anagha Ingle</i>	Social Scientist Vol:54 No:1-2	2026

Abstract: It is worth stressing that the distinctness of the dominant constitutional interpretation of affirmative action in the Indian case is that it does not interpret the goal of affirmative action as diversity (which is the norm in the global North) but rather as equity. This foregrounding of equity is popularly countered by those who challenge affirmative action with demands of value neutrality and assertions made in a regulatory language of merit, excellence and development.

Sl. No	Article	Author	Source	Year
2	Diversified Business Groups in the Global South: Underdevelopment and Monopoly	<i>Farwa Sial</i>	Social Scientist Vol:54 No:1-2	2026

Abstract: Diversified Business Groups (DBGs) are dominant players in the private sector of a number of Global North and Global South countries. Their historical role in Global North countries, including that of late- industrialisers, took several trajectories: while some metamorphosed into specialised groups concentrating on vertical integration, others became more networked and loosely distributed (for example, the Japanese Kieretsu). Additionally, some retained their primary characteristics of diversification but also transitioned into more sophisticated and complex business structures through a strategy of strategic internationalisation (Korean Chaebol).

Sl. No	Article	Author	Source	Year
3	'Striking the Right Chord': Deconstructing the Semantics, Semiotics and Politics of Protest Posters	<i>Suhasini Das Gooptu</i>	Social Scientist Vol:54 No:1-2	2026

Abstract: 'Sticks and stones may break my bones, but words can never hurt me.' In the deeply contentious and sometimes violent realm of social movements, traditional academic scholarship has gravitated towards the study of 'sticks and stones' over the comparatively meek domain of words and visuals. However, words, visuals and rhetoric matter. They construct the world around us by generating meanings and shaping the 'social imaginary' (Taylor 2003).

Sl. No	Article	Author	Source	Year
1	Gandhi, Marx, and the Idea of an Unalienated Life	<i>Sanjay Palshikar</i>	Social Scientist Vol:54 No:3-4	2026

Abstract: In an article published some time ago, Professor Akeel Bilgrami argues that there are 'genuine and deep affinities' between Gandhi and Marx, arising from the fact that they both appealed to the idea of an 'unalienated life'. He says that in their respective critical perspectives on modernity, they both reached the same diagnosis of the ills of the modern society: 'the transformation of the human subject into an object ... and, therefore, an increasing loss of genuine subjectivity and subjective engagement with the world and with others'. It is only if capitalism is overcome (Marx), or avoided (Gandhi), that our subjectivity can be restored (Bilgrami 2014: 130).

Sl. No	Article	Author	Source	Year
2	The Last Decade of the Indian Freedom Movement: Nationalist Politics in Madras, 1937–1947	<i>K.A. Manikumar</i>	Social Scientist Vol:54 No:3-4	2026

Abstract: Under the Government of India Act of 1935, the first election to the Madras Legislature was held in February 1937. In terms of the size of the electorate, it was larger than the one under dyarchy, comprising 13.2 per cent of the adult population (about six and a quarter million people) in 1937 as against 3.1 per cent (one and a half million) in 1920. This was mainly because, under the 1919 Act, those who paid a tax of 10/- and above annually were eligible to vote, whereas under the 1935 Act, all adult citizens who paid a property tax to the government, irrespective of the amount of tax, were entitled to vote. The 1935 Act also created a bicameral legislature in Madras, providing a maximum of 215 members for the Legislative Assembly and a maximum number of 56 for the Legislative Council (Krishnaswamy 1989: 259).

Sl. No	Article	Author	Source	Year
3	Transcending Euphoria: ‘Self-Employment’ or Subsidiarisation of Employment	<i>Abhishek Kumar and Avinash Kumar</i>	Social Scientist Vol:54 No:3-4	2026

Abstract: Prime Minister Narendra Modi has on several occasions celebrated India’s ‘self-employed’, declaring them as ‘entrepreneurs’ and ‘job creators’ essential to the Indian economy. The premise of this rhetoric is the recently observed shift in the composition of employment towards a more self-employed workforce, as evidenced by the Periodic Labour Force Surveys (PLFS) undertaken over the last seven years (Table 1). The share of self-employed workers has grown from 52.2 per cent in 2017–18 to 58.4 per cent in 2023–24. However, a deeper analysis of the PLFS data indicates that this shift is driven not by the increase in the ‘employers’ share, which is one of the three categories under this catch-all category of self-employment (SE), but by the increasing share of helpers in household enterprises (HHE), from 13.6 per cent in 2017–18 to 19.4 per cent 2023–24.

Sl. No	Article	Author	Source	Year
4	Mapping the Development of Gender History in the Sultanate Period(c. Thirteenth to Fifteenth Century)	<i>Asra Alavi</i>	Social Scientist Vol:54 No:3-4	2026

Abstract: Scholarship on gender and women's history has seen remarkable growth recently, with attempts made to integrate it into the historical field of enquiry and situate it alongside the traditional 'male-dominated' fields, such as political, economic, social, legal and cultural histories. Gender relations studies, which by extension have incorporated women's history, have been significant in tracing the development of medieval societies and have contributed to the history of medieval India, as they help contextualise the structures of power as well as the evolution of state formation. Moreover, a gendered lens makes historical enquiry more nuanced and analytically cogent, at the same time challenging narratives that have focused on men or treated major historical fields as domains of men's history.

Sl. No	Article	Author	Source	Year
1	Ramamurti Rajaraman: Cultivator of Many Fields	<i>Rajaram Nityananda , Ram Ramaswamy</i>	Resonance Vol:31 No:2	2026

Abstract: R. Rajaraman was a versatile physicist who contributed to many areas of research in physics and also to public policy. In this essay, we discuss his academic contributions to theoretical physics, including quantum field theory and its application to particle, nuclear, and condensed matter physics, as well as his later work on nuclear disarmament, nuclear safety and security.

Sl. No	Article	Author	Source	Year
2	How Fruit Flies Choose Their Mates: Sexual Isolation in <i>Drosophila</i>	<i>B N Singh</i>	Resonance Vol:31 No:2	2026

Abstract: Reproductive isolation is an important factor in the origin and maintenance of races and species. Among different types of reproductive isolating mechanisms, sexual isolation (pre mating or prezygotic) is an important barrier to random mating due to behavioural incompatibilities and constitutes the largest and most important class of reproductive isolation in animals. It has been extensively studied in the genus *Drosophila*, a very good biological model. When a large number of species were tested for sexual or ethological isolation, this phenomenon was found to be widespread in the genus *Drosophila*. The species vary in the degree and pattern of sexual isolation, which is often used to discuss their phylogenetic relationship and the direction of evolution between the species. Thus, the study of sexual isolation has evolutionary significance and plays an important role in the process of speciation. Different models have been proposed to discuss the evolutionary sequence of the species. Kaneshiro suggested that the species whose females more often fail to mate with the males of other species is the ancestral species, and the species whose females readily accept the males of other species is the derived one. On the other hand, Watanabe and Kawanishi proposed that it is the females of derived species that do not mate with the males of ancestral species, and the species whose females readily accept the courtship overtures of others is the ancestral species. In the light of these models, the evolutionary sequence between different species of *Drosophila* is discussed.

Sl. No	Article	Author	Source	Year
3	Are Protons Truly Stable?: Proton Stability: A Theoretical and Experimental Overview	<i>Ketan M Patel</i>	Resonance Vol:31 No:2	2026

Abstract: The enduring stability of protons is one of the main reasons for the existence of the present-day universe. But are they truly stable? This article briefly reviews the experimental status of this question and the theoretical reasons behind its stability, or lack thereof.

Sl. No	Article	Author	Source	Year
4	Variation in Physiology of Thermotolerance in Trees: Effects of Climate Change	<i>Aniruddh Sastry</i>	Resonance Vol:31 No:2	2026

Abstract: Rising temperatures and longer dry spells are pushing many Indian forests closer to the heat limits of their trees. This article explains how different types of leaves survive heat using different strategies. We first review the basics: how leaves make sugars through photosynthesis, how stomata balance carbon dioxide uptake with water loss (transpiration), and how water is pulled up tall trees by the cohesion–tension mechanism. We then introduce leaf mass per area (LMA), as a simple ‘investment’ measure of leaf design. Drawing on research from tropical dry forests, we show that higher-LMA (tough, long-lived) leaves tend to have higher critical temperatures(T50) but often lower photosynthetic rates, revealing heat–speed trade-off. We also discuss how drought exposure can increase thermotolerance, why evergreen species often outperform deciduous species in heat tolerance, and how thermal safety margins (T50– maximum leaf temperature) help predict vulnerability under climate change. Understanding these linked traits can improve conservation, reforestation choices, and climate-resilient ecosystem planning. Short classroom activities such as measuring leaf surface temperature and calculating LMA are included to connect concepts with local trees.

Sl. No	Article	Author	Source	Year
5	Resonant Transmission Through Rectangular Potential Well: Revisiting Ramsauer-Townsend Effect	<i>S Bose, J Mitra, Pintu Mondal</i>	Resonance Vol:31 No:2	2026

Abstract: The phenomenon of vanishingly small scattering cross-section of low-energy electron beam in noble gases like argon and xenon, commonly known as the Ramsauer-Townsend effect, can be explained by the method of partial cross-sections. In this article, the Coulomb potential inside noble gas atoms mis modeled as a rectangular well potential, and the resonant transmission of a low-energy electron beam through the wellies studied quantitatively and systematically. The approach provides a satisfactory explanation of the Ramsauer-Townsend effect and is within the reach of an undergraduate audience.

Sl. No	Article	Author	Source	Year
6	Evolution in Action: Interplay of Environment, Constraint, and Chance	<i>Sudipta Tung</i>	Resonance Vol:31 No:2	2026

Abstract: On a humid morning in coastal India, an ecologist walks through rice-wheat field and pulls up a small weed called Phalaris minor. A few decades ago, this grass succumbed easily to herbicides. Today it shrugs off multiple chemicals and continues to choke the crop. Nearby, a doctor reads a report warning that Mycobacterium tuberculosis strains resistant to multiple antibiotics are rising across India. At a laboratory, researchers watch Escherichia coli bacteria adapt to UV irradiation. Halfway across the world, the medium ground finches of Daphne Major in the Galapagos Islands evolve larger or smaller beaks as the climate flips between drought and rain. Though these examples span organisms, levels of biological organization, and continents, they are united by a common logic. Each scene reflects well-documented evolutionary change unfolding in the real world, shaped by the interplay of environment, biological constraint, and chance, which forms the central focus of this article.

Sl. No	Article	Author	Source	Year
1	Edward Teller – The Man and the Scientist (1908–2003)	<i>Susanta Mahapatra , Horst Koppel</i>	Resonance Vol:31 No:4	2026

Abstract: Edward Teller, a theoretical physicist, was born on January 15, 1908, in a middle-class Jewish family in Budapest, Hungary. Budapest was part of Central Europe, predominantly enriched by the German language and culture. The turbulence caused by World War I prompted Teller to leave Hungary. He began his studies in 1926 at the University of Karlsruhe, Germany, and earned a degree in Chemical Engineering. After a brief stint at the University of Munich, where he met Hans Bethe, he moved to the University of Leipzig.

Sl. No	Article	Author	Source	Year
2	Generalized Fibonacci Numbers: Compositions and Graphs	<i>Beimar J Naranjo, Jose L Ramrez</i>	Resonance Vol:31 No:4	2026

Abstract: This article serves as an expository and introductory work, exploring generalized Fibonacci numbers through the lens of integer compositions and graph theory. It is particularly suited for students interested in discrete mathematics, providing combination of combinatorial arguments, bijective proofs, and connections to various discrete structures. Key topics include the relationship between Fibonacci numbers and compositions, graphical representations such as barographs Young diagrams, and extensions to Tribonacci antitruancy sequences. Additionally, the article introduces colored compositions and towers of compositions.

Sl. No	Article	Author	Source	Year
3	Topological Currents in Electrodynamics	<i>Vivek M Vyas, Prasanta K Panigrahi</i>	Resonance Vol:31 No:4	2026

Abstract: Maxwell's electrodynamics is a rich source of physical and mathematical ideas. Here, we show how the displacement current introduced by Maxwell is related to the mathematical discipline of topology.

Sl. No	Article	Author	Source	Year
4	Ecology for Birdwatchers: Vigilance Behaviour	<i>Abdul Jamil Urfi, Paritosh Ahmed</i>	Resonance Vol:31 No:4	2026

Abstract: Vigilance behaviour is a vital life survival strategy for animals. With several applications in conservation biology, its study is important in our appreciation of behavioural ecology. Birds, because of their high detectability and diurnal habits, are popular study organisms in field ecology. Here, we attempt to explain the significance of vigilance behaviour of birds at their foraging and nesting grounds.

Sl. No	Article	Author	Source	Year
5	Mechanics of Linear Oscillator: A Physical System Almost Completely Overlooked in Physics Literature	<i>Saliha Tak, Niyaz Ahmad Rather</i>	Resonance Vol:31 No:4	2026

Abstract: In this article, we present the mechanics of an oscillator that is subject to a restoring force that is constant, independent of the position of the oscillator. Both classical and quantum mechanics are presented. Comparison with the simple harmonic oscillator is made in each case. We also present the momentum eigenfunctions of the oscillator and derive orthogonality relation of the Airy function which is the solution of Schrodinger equation for this system. One may note that the system is not normally presented in the physics literature. However, like the simple harmonic oscillator, the system can be used to illustrate the fundamental concepts of both classical and quantum mechanics.

Further, we usually use the boundary conditions on the wavefunction to obtain the eigenfunctions and eigenenergy's. In the case of a linear oscillator here, we illustrate the use of the symmetry requirement on the wavefunction to quantize the system.

Sl. No	Article	Author	Source	Year
6	Viruses: The Kingmakers in Evolution	<i>Gargi Sen, Sandipan Ghosh, Saroja Chhettri, Arnab Sen</i>	Resonance Vol:31 No:4	2026

Abstract: Viruses are non-cellular entities universally found in all forms of life, from bacteria to humans. Their profound influence has been highlighted by numerous pandemics throughout history, with the COVID-19 pandemic underscoring their significant impact on our lives, health systems, and economies. Beyond causing disease, viral genes are prevalent in our genomes, raising questions about their evolutionary role. A significant portion of the human genome consists of viral DNA, remnants of ancient infections that have become part of our genetic makeup. This incorporation has profoundly impacted our development and biology.

Sl. No	Article	Author	Source	Year
7	Why Do We Need ‘Tensors’ in Physics?	<i>C Joseph Prabagar</i>	Resonance Vol:31 No:4	2026

Abstract: In standard textbooks, the concept of a tensor is presented in a more abstract form, which places a considerable cognitive load on undergraduate students to comprehend it. This article presents a pedagogical introduction to the concept of a tensor in physics.

Sl. No	Article	Author	Source	Year
1	Rajasekaran's K-Matrix Criterion and the Foundations of Hadron Compositeness	<i>M Padmanath</i>	Resonance Vol:31 No:6	2026

Abstract: Notwithstanding the well-established status of quantum chromodynamics (QCD) as the theory of strong interactions, the internal composition of hadrons remains an open problem. Prof. G. Rajasekaran's (respectfully addressed as Rajaji in the Indian scientific community) work [1], one of the earliest attempts to address this, provided a physically transparent criterion for hadron compositeness using the analytic structure of the 'K-matrix'. He argued that the absence of Metropoles is a distinctive signature of dynamically generated states, providing a clean framework to extract hadron compositeness from scattering amplitudes. In this article, we visit these pioneering ideas by Rajaji [1] and place them in the context of modern developments, including Weinberg's compositeness relations, CDD ambiguity, effective field theory approaches, and contemporary lattice QCD analyses.

Sl. No	Article	Author	Source	Year
2	Guruswamy Rajasekaran (1936--2023): An Inward Bound Journey	<i>M V N Murthy, V Ravindran</i>	Resonance Vol:31 No:6	2026

Abstract: G Rajasekaran was active in research for more than six decades. He made significant contributions in a wide range of areas—hyper nuclear physics, flavour physics, current algebra, neutral current weak interactions, integer quark model, string theory, new forms of quantum statistics, neutrino physics, dark matter, etc. He published more than 200 research papers. He was always keen to enlarge his sphere of activity and influence over the development of high-energy physics (HEP) in the country. In the following, we try to summarize some highlights of his vast contributions to research, as well as other academic pursuits, chronologically following his spatial trajectory. While some research is explained in detail, others that require technical knowledge are briefly mentioned here for completeness.

Sl. No	Article	Author	Source	Year
3	Stochastic Hydrodynamics	<i>Sushanta Dattagupta</i>	Resonance Vol:31 No:6	2026

Abstract: Viscosity appears quite naturally in the Navier–Stokes equation, just as it does in the Langevin equation for Brownian motion. The issue we address here is: Is there a microscopic understanding of the hydrodynamic viscosity from the fluctuating properties of the surrounding bath? An elucidation of this question may lead to a thermodynamic analysis of hydro dynamic micro-engines `a la stochastic thermodynamics and possibly also of their quantum counterparts.

Sl. No	Article	Author	Source	Year
4	A Combinatorial Puzzle from Arithmetic: In Praise of Recreational Mathematics	<i>Kedar Mhaswade</i>	Resonance Vol:31 No:6	2026

Abstract: This article discusses an algorithmic approach and a computer program based on it to solve an elementary combinatorial problem. Its intended audience is high school students (and laypeople) with an aptitude for abstract thinking and an interest in problem-solving. The algorithm presented here is correct but inefficient. However, it sheds light on a well-known problem in theoretical computer science.

Sl. No	Article	Author	Source	Year
5	The Curious Case of a Mosquito Bite	<i>Martin J Babu</i>	Resonance Vol:31 No:6	2026

Abstract: Mosquitoes transmit deadly diseases such as malaria, dengue, chikungunya, and Zika, leading to a significant number of deaths each year. They are often referred to as ‘the most dangerous animal on Earth’. Despite this, the stealthy methods employed by mosquitoes for sucking blood and the sensory mechanisms involved in the process were discovered only in the last decade. This article explores how mosquitoes locate their human hosts and how their mouthparts work together to draw blood in a strategically covert manner. It discusses the organization of their olfactory organs, including the antennae, mouthparts, and proboscis, as well as the olfactory nerve tracts and the smell

centres in the mosquito brain. Additionally, the article highlights various innovations and applications inspired by the adaptive features of mosquitoes.

Sl. No	Article	Author	Source	Year
6	Markov Processes and Brain Network Hubs	<i>M Ram Murty, Asuri Narayan Prasad</i>	Resonance Vol:31 No:6	2026

Abstract: Current concepts of neural networks have emerged over two centuries of progress, beginning with the neural doctrine the idea of neural cell assemblies. Presently, neural network models involve distributed neural circuits of nodes, hubs, and connections that are dynamic across different states of brainfunction. Advances in neurophysiology, neuroimaging, andthe field of connectomics have given impetus to the applicationof mathematical concepts of graph theory. Current approachesdo have limitations and inconsistencies in the resultsthey achieve. We model the neural network of the brain as adirected graph and attach a matrix (called the Markov matrix)of transition probabilities (determined by the synapticstrengths) to every pair of distinct nodes, giving rise to a discreteMarkov process. We postulate that the network hubsare the nodes with the highest probabilities given by the stationarydistribution of Markov theory. We also derive a newupper bound for the diameter of a graph in terms of the eigenvaluesof the Markov matrix.

Sl. No	Article	Author	Source	Year
7	Quantum Computing for Molecular Systems: Part II Quantum Encoding	<i>Harshdeep Singh, Sonjoy Majumder, Sabyashachi Mishra</i>	Resonance Vol:31 No:6	2026

Abstract: This is the second part of the review article series ‘QuantumComputing for Molecular Systems’. While the first part1 introducedthe theoretical foundations of quantum computing,the present part introduces the formalism of second quantizationand its role in quantum simulation. Weex plain how fermionic Hamiltonians describing the electronicstructure of molecular systems can be systematically encodedinto qubit Hamiltonians suitable for quantum hardware. Severalpopular transformation techniques are discussed, includingthe Jordan–Wigner, Bravyi–Kitaev, and other advancedmappings, with a discussion of their cost, advantages, andtrade-offs.

Sl. No	Article	Author	Source	Year
1	AI and IoT-Driven Green Energy Solutions: Challenges, Opportunities, and Future Trends	<i>Khadim Moin Siddiqui, Vidushi Singh, Shivam Kumar, Harsh Shukla, Parisa Shirinabadi, Amirreza Samadi Bonab</i>	I-Manager on IoT and Smart Automation Vol:4 No:1	2026

Abstract: The integration of Artificial Intelligence (AI) and the Internet of Things (IoT) is revolutionizing energy conservation by enabling smarter, data-driven energy management systems. The current investigation explores AI and IoT-driven green energy solutions, highlighting their role in optimizing energy consumption, improving system efficiency, and promoting sustainability. AI-powered predictive analytics and machine learning techniques facilitate real-time decision-making, while IoT-enabled smart sensors and connected devices ensure precise energy monitoring and control. These technologies are instrumental in transforming smart grids, industrial automation, and intelligent building management. However, challenges such as cybersecurity threats, interoperability issues, and high implementation costs hinder widespread adoption. Emerging advancements, including blockchain, edge computing, and federated learning, are poised to address these limitations and enhance the effectiveness of AI-IoT integration in energy systems. In this review, the AI and IoT based green energy solutions difficulties, chances and upcoming trends have been discussed.

Sl. No	Article	Author	Source	Year
2	Multi-Objective Optimization Approaches for Resource-Constrained IoT Environments	<i>Kaki Ramya Sree, Chintalapudi V. Suresh</i>	I-Manager on IoT and Smart Automation Vol:4 No:1	2026

Abstract: This paper presents a multi-task-based optimization framework that addresses the trade-offs among energy efficiency, latency reduction, reliability enhancement, and computational cost minimization in resource-constrained IoT environments. This paper proposes a three-tier device edge cloud architecture with an adaptive decision engine leveraging context-aware offloading, dynamic routing, and lightweight computation balancing as its framework for resource-limited IoT contexts. A group of typical IoT scenarios were investigated and these results show significant improvements in data-driven performance: Up to 39% energy savings, 46% latency reduction, and 13% better reliability against baseline strategies as demonstrated by the results obtained. We demonstrate that using multi-objective optimization is a valid

and scalable technique for realizing Pareto-efficient performance in heterogeneous IoT systems with the ability to address dynamic operating scenarios in the dynamic and resource-limited environment.

Sl. No	Article	Author	Source	Year
3	Hybrid Navigation Autonomous Mobile Robots: Grid Mapping, Line Following, and Dynamic Obstacle Evasion	<i>Pravesh Kumar Kulmitra, Shashank Rana, Priyanshu Gupta, Surekha Bhusnur</i>	I-Manager on IoT and Smart Automation Vol:4 No:1	2026

Abstract: Autonomous Mobile Robots (AMRs) have become integral to the evolution of automation systems, particularly in industrial and logistics sectors where efficiency, accuracy, and adaptability are crucial. This research focuses on the development and implementation of an AMR that operates within a structured grid-based coordinate system, integrating advanced navigation strategies to ensure reliable and autonomous movement. The proposed robot is equipped with Infrared (IR) sensors for precise line-following functionality, allowing it to navigate predefined pathways with minimal deviation. In parallel, an ultrasonic sensor mounted on a servo motor is employed for dynamic obstacle detection. This configuration enables the system to scan the surroundings in real-time, identify obstructions, and initiate path recalibration to avoid collisions. The navigation strategy involves a multi-phase approach that begins with the assignment of specific target coordinates within the grid. The robot then executes path planning based on the shortest route available, factoring in potential detours based on real-time sensor input. When obstacles are detected along the path, the AMR intelligently reroutes itself by adjusting its movement commands to find alternative paths that still lead to the destination efficiently, minimizing delays and ensuring continuity in operation. Experimental trials in a controlled environment confirmed that the AMR reliably reaches its target coordinates while effectively avoiding both static and dynamic obstacles. This scalable and practical solution demonstrates strong potential for use in smart warehouses, manufacturing, and automated delivery systems, contributing to the advancement of intelligent AMR technologies in real-world automation applications.

Sl. No	Article	Author	Source	Year
4	The Rise of the Autonomous Parking System	<i>Ch Sekhar, Jashni M</i>	I-Manager on IoT and Smart Automation Vol:4 No:1	2026

Abstract: This study focuses on building a smart automatic parking system that works without any human help. In big cities, it is hard to find a parking spot because of the growing number of vehicles and limited space. The old parking methods are slow and waste a lot of time and space. This survey shows a smart way using Artificial Intelligence (AI) and the Internet of Things (IoT) to solve this problem. This smart parking method is helpful for smart cities where technology is used to improve daily life. The sensors help in checking the presence of vehicles, and cameras help in monitoring the entire parking area. The system uses Arduino, Raspberry Pi, sensors, and cameras to check which parking spots are free or full. It also uses OCR (Optical Character Recognition) to read vehicle number plates. The system can also guide the vehicle to the nearest available spot, making the parking process quick and easy. All this information is processed by AI and shown on mobile apps or display boards in real time, so drivers can easily find a free parking spot without anyone managing it manually. This system reduces traffic, saves fuel, and lowers pollution because drivers don't need to search for parking. It is fully automatic, works with less cost, and can be used in many places like malls, offices, or public areas. This study proves that automatic parking systems can save time, reduce stress, and make better use of space. It is a smart and modern solution for today's parking problems.

Sl. No	Article	Author	Source	Year
1	A Blockchain-Based Model for Secure Information Dissemination to Enhance Investor Confidence in Nigeria's Oil and Gas Sector	<i>Oluwaseun Adeniyi Ojerinde, Joseph Ndagatsa Mamman, John Kolo Alhassan, Benjamin I Lunuamie Alenoghena</i>	I-manager Journal on Information Technology Vol:15 No:1	2026

Abstract: The problems of inconsistent reporting, the visibility of data, and the practice of regulation have greatly affected the confidence of stakeholders in the oil and gas industry of Nigeria. This study attempts to identify the issues and evaluate a permissioned blockchain model designed to alleviate the issues in reporting. The Model uses the Hyperledger Fabric (HF) architecture and combines smart contracts with role-based access control to ensure the safekeeping of data, timely verification of data, and the maintenance of compliance records that are audit-

able and retrievable. The model was assessed using a variety of methods. The researcher utilized the development of the system architecture, carried out controlled simulations, and distributed surveys to the industry stakeholders. Results from the simulations showed that the model provided an improvement in the strength of transaction integrity, auditability, and an overall improvement in fault tolerance when compared to traditional reporting systems. Participants in the survey recognized potentially positive changes in transparency and predictability, even if these views were conditioned by the transparency of the institution and the operational environment. The system is designed to improve the available data governance and reduce instances of data capture. The system simulated a range of 198 to 1240 transactions per second and had a latency of between 118 to 226 milliseconds. Integrity tests showed full recognition of attempts to modify data which stakeholders' surveys showed 78-91% agreement for questions related to transparency, trust, and use case clarity.

Sl. No	Article	Author	Source	Year
2	STARTIFY: A System that uses AI Agents to Launch Startups from Idea to Execution	<i>Krunal Borad, Piyush Kadam, Siddhesh Kalyankar, Jenil Kotadia, Dr. Satish Salunkhe</i>	I-manager Journal on Information Technology Vol:15 No:1	2026

Abstract: Startify is a smart system aimed at helping aspiring entrepreneurs by assisting them in managing the entire startup life cycle from idea creation to implementation. The platform offers a central location for users to exchange and assess their business ideas with the help of AI. The tool leverages the potential of AI technology using Google Gemini to provide insightful analysis of user input, personal feedback, and assistance in creating a business strategy. Collaboration is another core principle of the platform, and it allows users to find other likeminded people and build an even team of individuals who complement each other in terms of expertise. Startify offers a convenient user interface created with the help of Flutter and supports collaboration by having a powerful backend based on Python, Firebase, and Supabase technologies. With AI technology, structured approach, and collaborative features, Startify becomes the smart ecosystem where users can validate concepts, address any problems, and constantly improve their startups.

Sl. No	Article	Author	Source	Year
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3	Intelligent Real-Time Traffic Congestion Monitoring and Prediction System Using Machine Learning	<i>Kishore Kumar K., S, Jeevanantham , Janakiraman A. N. G., Gowthami K.</i>	I-manager Journal on Information Technology Vol:15 No:1	2026
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Abstract: The rapid urbanization and growing number of vehicles in cities have made traffic congestion a critical issue affecting productivity, energy consumption, and the environment. This paper presents the design and implementation of an Intelligent Real-Time Traffic Congestion Monitoring and Prediction System that integrates Machine Learning (ML) and the Internet of Things (IoT). The system gathers live traffic data using IoT sensors and cameras, processes it through a cloud-based analytical pipeline, and predicts congestion levels using ML algorithms. Results are visualized on a real-time dashboard to help authorities take proactive control actions such as signal optimization and route diversion. The framework aims to enhance road efficiency, reduce travel time, and promote sustainable urban mobility.

Sl. No	Article	Author	Source	Year
4	ClimaVision: Deep Learning for Short-Term Atmospheric Forecasting	<i>Vutukuru Sathya Sai Harshit, Harshita Handa, Sai Charani Sannapureddy, Dr. Elumalaivasan P</i>	I-manager Journal on Information Technology Vol:15 No:1	2026

Abstract: Accurate short-term atmospheric forecasting is essential for climate monitoring, disaster management, and environmental planning. Traditional numerical weather prediction models require significant computational resources and may struggle to capture complex nonlinear atmospheric patterns. This study presents ClimaVision, a deep learning-based framework for short-term atmospheric prediction using ERA5 reanalysis data. The proposed system leverages historical atmospheric variables including temperature, sea level pressure, wind components, and cloud cover to forecast future atmospheric conditions. Multiple deep learning models, including Long Short-Term Memory (LSTM), Graph Neural Networks (GNN), Transformer, and NBEATS, are implemented to capture spatiotemporal dependencies in atmospheric data. The models are trained using historical sequences of atmospheric observations and evaluated using standard regression metrics such as Mean Squared Error (MSE), Mean Absolute Error (MAE), and R² score. Experimental results demonstrate that deep learning models can effectively learn atmospheric patterns and provide reliable short-term forecasts. The proposed ClimaVision framework highlights the potential of AI-driven approaches for improving atmospheric prediction systems.

Sl. No	Article	Author	Source	Year
5	Malware Detection using Machine Learning	<i>Ms. Aiswarya Priyadarshini S, Dhineshwaran M, Aathiganesh S, Charan Deepak M</i>	I-manager Journal on Information Technology Vol:15 No:1	2026

Abstract: Malware continues to pose a significant threat to modern computing systems due to its rapidly evolving nature and the increasing sophistication of cyber-attacks. Traditional detection approaches such as signature-based antivirus systems struggle to identify new and unknown malware variants, particularly zero-day and polymorphic threats. This paper presents a machine learning-based malware detection framework designed to classify executable files as either benign or malicious using behavioural and metadata-based features. A dataset consisting of 10,000 executable samples, including 6,000 malicious files and 4,000 benign files, was collected from public malware repositories and trusted system environments. Several machine learning algorithms, including Decision Tree, Random Forest, and Neural Network models, were implemented and evaluated. The dataset was divided into 70% training, 15% validation, and 15% testing sets to ensure reliable model evaluation. Experimental results show that the Decision Tree classifier achieved an accuracy of 88.5%, while the Random Forest model achieved 95.6% accuracy. The Neural Network model achieved the best performance with an accuracy of 96.4%, precision of 0.95, recall of 0.97, and F1-score of 0.96. These results demonstrate that machine learning techniques significantly improve malware detection performance compared to traditional signature-based approaches. The proposed system also includes a lightweight interface for file analysis, enabling efficient malware classification. Future work will focus on integrating deep learning models and real time behavioural monitoring to enhance detection of advanced malware variants.

Sl. No	Article	Author	Source	Year
1	Android Asset Encryption with Runtime Decryption Using White-Box Cryptography and Virtualized Key Protection	<i>Karthik D., Mahibalan S., Sreedevi B.</i>	I-manager Journal on Software Engineering Vol:20 No:3	2026

Abstract: The security of digital assets within Android applications is a critical concern for developers, as the open nature of the Android ecosystem makes reverse engineering straightforward. Traditional protection methods, including hardcoding Advanced Encryption Standard (AES) keys within Java source code, obfuscating with ProGuard, and even implementing encryption logic in native code, have proven ineffective against modern static analysis tools and dynamic instrumentation frameworks like Frida. Cryptographic keys remain vulnerable to extraction within seconds through Java Cryptography Architecture (JCA) API hooking, memory dumping of native heaps, and inline hooking of JNI functions, as current implementations fail to adequately protect key material during runtime operations. This paper proposes a novel, robust framework that addresses these vulnerabilities through a dual-layer protection mechanism integrating White-Box Cryptography (WBC) with custom Virtual Machine (VM) protection. Our solution employs AES-256 for asset encryption and runtime decryption, while protecting the AES-256 key through a dual-layer approach: first, by embedding it within white-box cryptography, and second, by obfuscating the decryption logic using a custom virtual machine opcodes. This hybrid architecture, implemented in a native C++ library, ensures that the key never appears in memory in plaintext form. The system implements automated asset encryption during build time and injects protected decryption routines that transparently replace standard Android AssetManager operations.

Sl. No	Article	Author	Source	Year
2	Software Evolution Process Modeling and Optimization Applying Colored Petri Nets	<i>Rajeeb, Prof. Jibendu Kumar Mantri</i>	I-manager Journal on Software Engineering Vol:20 No:3	2026

Abstract: Software evolution applies to the continuous software development and modification of software systems after their initial release to meet changing end-user operational requirements. Effective evolution needs systematic adaptation of existing software processes to maintain software quality, reduce uncertainty or unpredictability, and rework. Tailoring software processes from established designs and standards can importantly enhance workflow effectiveness and ensure the reliable delivery of final products. However, this study lack of a well-defined and

built method for tailoring the software evolution process. In this paper, we propose a systematic procedure for tailoring the software evolution process based on four basic blocks: sequence or series, concurrency or parallel, choice or selection, and iteration or loop In Tailoring Software Process, the basic blocks are formally defined by applying Coloured Petri Net (CPN), enabling modeling of relationships between behavior and structure. The proposed method ensures that there are consistency, flexibility, and clarity during software process modification and applicability, the approach is used to model a composite web service in an Online Order business process application, Hence, we can describe the CPN-based modeling can effectively support evolution of software process adaptation.

Sl. No	Article	Author	Source	Year
3	Design and Development of a Freelance & Micro Job Platform for College Students	<i>Prasanna Lohe, Vaibhav Bhaladhare, Rugved Deshmukh, Srushti Mohadikar, Shrutika Bagdi, Om Bhosale</i>	I-manager Journal on Software Engineering Vol:20 No:3	2026

Abstract: The rapid growth of digital technologies has transformed how college students learn, collaborate, and engage in skill-based work. However, most existing freelancing and collaboration platforms are generic and do not specifically address academic requirements, leading to challenges such as limited collaboration support and lack of opportunities for students to effectively utilize their skills. This paper presents the design and development of a student-centric freelance and micro job platform that integrates real-time collaboration with freelancing features. The system allows students to create profiles, showcase skills, participate in micro jobs, and collaborate on projects within a unified environment. It is developed using a client-server architecture with technologies such as React.js, Spring Boot, MySQL, and WebSocket for efficient and real-time interaction. The platform includes modules for authentication, project management, collaboration, and communication, ensuring a structured workflow. Performance evaluation indicates that the system is efficient, reliable, and scalable. The proposed solution enhances student productivity, provides practical exposure, and improves employability by bridging the gap between academic learning and freelancing opportunities.

Sl. No	Article	Author	Source	Year
4	ICCICT 2026_ HCAN: Software Defect Prediction using Hierarchical Code-Aware Attention Network	<i>Mr. P. Ramesh, Dr. Prasath S</i>	I-manager Journal on Software Engineering Vol:20 No:3	2026

Abstract: Software defect prediction is a vital task in software engineering that aims to identify defect-prone modules at an early stage of the software development lifecycle, thereby reducing maintenance cost and improving overall software reliability. With the increasing complexity of modern software systems, traditional defect prediction approaches based on hand-crafted metrics and classical machine learning techniques have shown limited effectiveness in capturing the deep semantic and structural properties of source code. The primary objective of this study is to enhance defect prediction accuracy by effectively modeling the hierarchical nature of source code. To achieve this, a Hierarchical Code-Aware Attention Network (HCAN) is proposed, which represents source code at token, statement, and method levels and applies multi-level attention mechanisms to focus on defect-prone code regions while preserving semantic context. The proposed model integrates embedding layers, BiLSTM-based encoders, and attention mechanisms to generate discriminative hierarchical code representations. Experimental evaluation demonstrates that HCAN outperforms traditional machine learning and existing deep learning models in terms of accuracy, precision, recall, and F1-score. The results confirm that hierarchical code representation combined with attention mechanisms significantly improves defect prediction performance. In conclusion, HCAN provides an effective, interpretable, and scalable solution for real-world software defect prediction tasks.

Sl. No	Article	Author	Source	Year
5	Cloud-Based AI Tutor for Rural School Children	<i>Manoj M., Balu V., Jahnavi M., Sivashankar R., Bhavana P.</i>	I-manager Journal on Software Engineering Vol:20 No:3	2026

Abstract: According to this paper one of such developed is a cloud-based AI tutoring system that is supposed to enhance the learning process in the schoolchildren, particularly in the rural schools. It will be more interesting to combine gamification and interactive artificial intelligence catboat's with students. Each subject is further broken down into smaller topics and levels. This structure helps students manage their studies

effectively and provides the right materials and multiple-choice questions to assess their knowledge level. Students benefit from quick feedback and become aware of their weaknesses since they earn points for improvements. Admins can effectively monitor performance and address issues. The personalized support from the conversational AI chatbot lets students ask questions and receive help when needed, making the learning process easier and more productive. This approach ensures that students in rural areas receive high-quality education, encouraging them to continue their studies. The system also promotes collaborative learning among students, which boosts overall educational achievement. Additionally, the platform's scalable design allows it to extend its services to more students in other regions, making decentralization a viable long-term solution. Cloud technology ensures the system is reliable and accessible anytime, anywhere, supporting a continuous learning process.